



SAP® Certification Success Guide

For the
C_TS422
exams

Application Associate Exam

SAP S/4HANA® Production Planning and Manufacturing Certification Guide

»Achieve success with the only SAP-endorsed certification guide«

Siva Kumar Mutnuru



Rheinwerk
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Dear Reader,

In school, I was always a procrastinator when it came to studying for a test.

Write a ten-page essay by Tuesday? Sure thing! Read the entirety of a classic novel by Friday? No problem! Tests, on the other hand, were the bane of my existence, so I always put off studying. The longer I waited to tackle math equations, scientific formulas, and lists of historic world leaders, the more they piled up. By midnight the night before a test, those letters and numbers began to swim around on the page and lose all meaning to me.

After trial and error (and some failed attempts), I realized that my best studying didn't happen late at night, alone at my desk. It happened in the classroom weeks before it was time to put pencil to paper. If I paid attention, took detailed notes, asked questions, and made sure I fully understood one topic before moving on to the next, I found myself fully prepared for an exam—no late-night cramming required!

Think of *SAP S/4HANA Production Planning and Manufacturing Certification Guide* as your classroom, and author Siva Kumar Mutnuru as your teacher. This is the place where your certification status starts, so read carefully, take your time with the practice questions, and remember to pace yourself. With Siva's expertise and guidance, you'll be well on your way to acing your exam!

What did you think about *SAP S/4HANA Production Planning and Manufacturing Certification Guide*? Your comments and suggestions are the most useful tools to help us make our books the best they

can be. Please feel free to contact me and share any feedback you may have.

Thank you for purchasing a book from SAP PRESS!

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If you want to zoom in on a figure (especially in iBooks on the iPad), tap the respective figure once. By tapping once again, you return to the previous screen. You can find more recommendations on the customization of the screen layout on the [Service Pages](#).

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Preface

This book is written primarily for anyone preparing for the SAP Certified Application Associate - SAP S/4HANA Production Planning and Manufacturing (C_TS422) exam. This book can also help application consultants, project team members, business process experts, solution architects, business department managers, and all those who would like to gain knowledge in production planning and manufacturing. Additionally, this book will be useful for experienced consultants who want to revisit the basics and understand the nuances of production planning within SAP S/4HANA. This book focuses on the core SAP S/4HANA production planning and manufacturing capabilities, including demand management, material requirements planning, capacity planning, advanced planning, and all three production types in production planning: discrete manufacturing, lean manufacturing (which comprises of repetitive manufacturing [REM] and kanban), and process manufacturing.

How This Book Is Organized

The book is closely aligned with the C_TS422 exam structure and course content. It is written in simple and straightforward language using real-world scenarios and practical examples. To enhance your reading experience and prepare you for the certification exam, each chapter of the book provides a list of key terms, as well as multiple-choice practice questions and answers to help test your knowledge at the end of each chapter. The main aim of the book is to prepare you for certification, but it also provides basic customization knowledge that is central to understanding how standard SAP

processes work and how to manage out-of-the-box functionalities in implementation scenarios.

Each chapter begins with an overview and is divided into multiple sections to logically combine topics as they will appear on the exam. System screenshots and diagrams are included throughout the book to enhance your understanding of the topics. Additionally, the book includes tips, notes, and warning boxes to give you hints along the way. The weight of each exam topic is indicated, along with the exam objectives, so that you know exactly what to expect on test day. The structure of the book itself is designed to help you focus on your learning journey and succeed in your certification exam.

Now let's review, at a high level, what is covered in each chapter of this book:

- **Chapter 1: Introduction to Supply Chain Planning**

This chapter outlines the functionality and background of SAP S/4HANA and describes its main components, including digital transformation, the intelligent enterprise initiative, SAP Business Technology Platform (SAP BTP), and SAP's user experience (UX) strategy. It also covers the evolution of production planning and manufacturing in SAP S/4HANA and describes the key concepts and tools available for supply chain planning.

- **Chapter 2: Master Data for Production in SAP S/4HANA**

This chapter explains the production-relevant organizational elements of master data and the purpose and usage of that master data, including the material master, bill of materials (BOM), work centers, and routing/task lists. The production version master data object gained prominence in SAP S/4HANA and has become a mandatory object for production processes and advanced planning. We also cover engineering change management in this chapter.

- **Chapter 3: Demand Management**

This chapter covers demand planning and compares the different production methods and planning strategies in make-to-stock (MTS), make-to-order (MTO), and assembly planning. We go into detail about strategies to support components, as well as how to manage planned independent requirements (PIRs) and create a demand plan.

- **Chapter 4: Material Requirements Planning**

The chapter describes common material requirements planning (MRP) procedures, outlines the differences between classic MRP and MRP Live, explains the steps of MRP, and describes lot size procedures. We also outline the selection of appropriate planning procedures. We discuss various SAP Fiori apps available for evaluation of MRP results and the decision support provided by these apps.

- **Chapter 5: Production Orders in SAP S/4HANA**

This chapter explains process and production orders configuration, including salient features and intricate details to help you prepare for certification. We cover master data selection, describe order status management and how to set user statuses, explore availability checks, and provide an outline of production order execution, including confirmations and various goods movements. We also cover order settlement processes and conclude with order closure, archiving, and deletion.

- **Chapter 6: Lean Manufacturing in SAP S/4HANA**

This chapter covers repetitive manufacturing-specific master data, explains the line load planning and confirmation, and outlines kanban master data and kanban processes.

- **Chapter 7: Process Orders**

This chapter characterizes process order elements and process

order processing. It covers how to determine master data objects for process orders and identify features for Good Manufacturing Practices (GMP).

- **Chapter 8: Capacity Planning in SAP S/4HANA**

This chapter explains the capacity management functions and covers how to calculate capacity requirements. It also explores finite scheduling and dispatching with various tools, including the tabular planning table, the Schedule Production SAP Fiori app, and the graphical planning table.

- **Chapter 9: Advanced Planning**

This chapter explains the basics of advanced planning, including the master data and tools available for advanced planning and detailed scheduling processes. It also explains common planning evaluation concepts and outlines new trends in planning, like demand-driven replenishment (DDR) and predictive material and resource planning (pMRP).

The highlighted boxes in this book contain information that is good to know and useful, but outside the context of the current topic. To help

you immediately identify the type of information contained in the boxes, we have assigned symbols to each box.

[»] Note

Boxes marked with this symbol contain information about additional topics or important content that you should note.

[+] Tip

This symbol refers to specifics that you should consider. It also warns about frequent errors or problems that can occur.

[!] Warning

This symbol warns you of important points that are potentially confusing or likely to be overlooked.

Acknowledgments

I am extremely thankful to my better half Sarada and my lovely sons Rishi and Param for their patience, understanding, and unconditional support throughout writing of this book. Encouragement from my entire family, my parents, my siblings, and support from my colleagues made this book a reality. I got an awesome team to work with on this book—I am thankful to my former colleagues and good friends Amit Batra and Ramandeep Singh for their great support. Amit contributed with the entire chapter of advanced planning and Ramandeep with process orders chapter. I am thankful to Stefanos Pougkas for providing his introduction template to use in this book.

Big thanks to SAP Press and Emily Nicholls for giving me this opportunity and supporting me during the initial stages of the book writing, and to Rachel Gibson for her excellent support and patience in shaping the book. Finally, I take this opportunity to thank all the COVID-19 warriors across the world for supporting humanity and helping the world come to terms with this pandemic.

Summary

The certification exam is structured to test your abilities and ensure that you have an overall understanding of the topic as well as in-depth technical skills. With this book, you will understand how to approach each certification topic based on the chapter structure and practice questions. You can answer these questions, test your understanding, review the answers, and if needed, revisit any topics you find difficult. This practice will help you better understand how the exam questions are structured and how to identify the correct answers. The practice questions in this book are deliberately structured so that you will encounter easy, moderately complex, and tough questions, as you will on the certification exam. The answers will provide you with the ample insights into each topic and help deepen your understanding. Overall, this certification guide aims to provide you with the skills you need to confidently pass the exam and become an SAP Certified Application Associate in SAP S/4HANA Production Planning and Manufacturing.

Introduction: The Path to Certification

Techniques You'll Master

- Scope and target audience for the C_TS422 certification
- Courses required for the certification
- Techniques for taking the certification exams
- Further relevant SAP Training and Adoption offerings in SAP S/4HANA
- Additional resources for production planning and manufacturing in SAP S/4HANA
- Expanded knowledge and up-to-date skills

This chapter presents the overall picture of the examination and certification as SAP S/4HANA Production Planning and Manufacturing Application Associate. It provides information about the different offerings for SAP S/4HANA Production Planning and Manufacturing certifications, highlights resources for study, and gives advice on taking certification exams.

With SAP S/4HANA, SAP has introduced a new type of enterprise resource planning solution to help customers become a truly digital enterprise. SAP S/4HANA is the most important product in the SAP portfolio, with production planning still at the heart of the processes and functionalities supported. As more and more customers implement SAP S/4HANA, the number of projects worldwide is also growing rapidly, resulting in the need for more implementation and support consultants who understand core production planning and manufacturing functions.

In this chapter, we discuss the details of the SAP S/4HANA Production Planning and Manufacturing Application Associate certification and the SAP Training and Adoption materials required to obtain the certification. We discuss how to access the SAP Training and Adoption materials, and then go through some tips for preparing and successfully passing the certification exam. Finally, we look at some additional resources that could be useful in preparing for the exam and on your further path with SAP S/4HANA.

Who This Book Is For

There are few SAP projects in the world that don't require project staff who are familiar with the production planning and manufacturing processes and configuration. This was the case for SAP ERP with production planning and applies to SAP S/4HANA also. This makes production planning and manufacturing consultants with good skills and solid experience a valuable and demanded resource for both SAP partner companies and SAP customers.

This book covers a broad and deep scope of configuration and business processes for production planning and manufacturing in SAP S/4HANA. Therefore, it's an excellent starting point for those of you who are just beginning with production planning. For example, you might be a new employee at an SAP implementation partner, an internal support consultant whose company is upgrading to SAP S/4HANA, or a recent graduate looking to start a career in the SAP environment.

This book is also a good opportunity for experienced consultants to revisit the basics. Often, as your experience increases, you begin to specialize in one part of production planning and manufacturing. This book will help you look again at the overall picture of production

planning and manufacturing and at the same time familiarize yourself with the special features of SAP S/4HANA.

Those who work as users in production planning often want to go beyond this role to gain a deeper and broader understanding of the implementation or to work as key users.

Developers who want to focus on production planning and manufacturing or gain a good understanding of common business processes configured with SAP S/4HANA will also find this book useful, even if they aren't interested in the certification aspect.

The book is designed around the latest SAP S/4HANA 2020 release and certification. However, it covers core processes that are now quite mature, so the knowledge found here should be helpful for both early and future releases of the product as well as for the corresponding certifications.

Certifications the Book Is Designed For

This book can be used to study for the following tests:

- C_TS422_1809
- C_TS422_1909
- C_TS422_2020

This book is primarily intended as preparation for the latest certification C_TS422_2020 SAP Certified Application Associate - SAP S/4HANA Production Planning and Manufacturing. It tests your process and configuration knowledge in production planning and manufacturing and is based on the latest SAP S/4HANA release 2020 and the corresponding SAP Training and Adoption courses. But this book can also be used to study for older versions

C_TS422_1809 (which will be available until March 31, 2022) and C_TS422_1909.

[»] Note

You'll find information on available certifications at <http://s-prs.co/v218510>.

Format of the Certification Exam

The certification has the following format:

- *Length of exam:* Up to three hours.
- *Exam questions:* 80 questions of the following types:
 - Multiple choice, for which you must select one correct answer out of the four available options
 - Multiple select type 1, for which you must select the two correct answers out of the four available options
 - Multiple select type 2, for which you must select the three correct answers out of the five available options

There are no other question types than these. Note that you must get all answers correct for each question for the question to be considered correctly answered.

- *Exam location:* The exam can be taken either at a certification center or online through the SAP Certification Hub. The SAP Certification Hub is a cloud offering on a subscription basis. You subscribe annually and can make six certification attempts during this period. That means if you always pass the first try, you can potentially earn six different certifications. For each individual

certification, you'll get up to three attempts, which means you can fail a maximum of two times per subscription.

Exam C_TS422_2020 is one of the toughest exams and to pass the certification, you must answer 55% of the questions correctly. This means that you must answer 44 out of 80 questions completely correctly. The percentage for the pass rate varies depending on the certification and may change in future versions of an exam as it depends on the rated difficulty of the question items in the certification. You can choose the desired certification (e.g., C_TS422_2020) and get all relevant information about the exam at <http://s-prs.co/v218510>, including the cut score, possible exam locations, sample questions, and which SAP courses you need for preparation. A list of available certifications is shown in [Figure 1](#).

| Available Certifications: | |
|---|------------------------------|
| C_ACTIVATE13 - SAP Certified Associate - SAP Activate Project Manager | View Details |
| C_ARCIG_2108 - SAP Certified Application Associate - SAP Ariba Integration with Cloud Integration Gateway | View Details |
| C_ARCON_2108 - SAP Certified Application Associate - SAP Ariba Contracts | View Details |
| C_ARP2P_2108 - SAP Certified Application Associate - SAP Ariba Procurement | View Details |
| C_ARSOC_2108 - SAP Certified Application Associate - SAP Ariba Supply Chain Collaboration | View Details |
| C_ARSOR_2108 - SAP Certified Application Associate - SAP Ariba Sourcing | View Details |
| C_ARSUM_2108 - SAP Certified Application Associate - SAP Ariba Supplier Management | View Details |
| C_BOBIP_A2 - SAP Certified Application Associate - SAP BusinessObjects Business Intelligence Platform 4.2 | View Details |
| C_BOBIP_A3 - SAP Certified Application Associate - SAP BusinessObjects Business Intelligence Platform 4.3 | View Details |

Figure 1 List of Available Certifications

The soon-to-expire certifications are also available on that website, as shown in [Figure 2](#). This is also an indication and motivation to renew the acquired certifications before three SAP S/4HANA version releases. For example, C_TS420_1809 - SAP Certified Application

Associate - SAP S/4HANA Production Planning and Manufacturing (1809) won't be available after March 31, 2022.

The screenshot shows a teal header bar with the title "Certification Validities". Below it is a note about the availability and validity of certifications. The main content area is titled "Available Certifications:" and contains a section titled "Soon to expire Certifications". This section lists several SAP certifications with their expiration dates and "View Details" links. The list includes:

| Certification | Expiration Date | Action |
|--|--------------------|------------------------------|
| C_BRM_1909 - SAP Certified Application Associate - SAP Billing and Revenue Innovation Management | December 31st 2021 | View Details |
| C_C4H20_94 - SAP Certified Application Associate - SAP CPQ Implementation | October 30th 2021 | View Details |
| C_C4HL2C_92 - SAP Certified Business Associate - SAP C/4HANA Business Processes: Lead to Cash | December 31st 2021 | View Details |
| C_EP_750 - SAP Certified Technology Associate - SAP Enterprise Portal 7.50 | December 31st 2021 | View Details |
| C_HRHHT_1708 - SAP Certified Application Associate - SAP SuccessFactors Talent Hybrid (1708) | December 31st 2021 | View Details |
| C_PA100_35 - SAP Certified Application Associate - SAP Predictive Analytics | December 31st 2021 | View Details |

Figure 2 Soon-to-Expire Certifications

C_TS422_2020 Certification

This book is primary intended as preparation for the latest certification, C_TS422_2020: SAP Certified Application Associate – SAP S/4HANA Production Planning and Manufacturing. If you're familiar with or certified in the SAP ERP production planning certification, you should have no problem identifying the delta and passing the certification exam for SAP S/4HANA.

The C_TS422 certification will likely, but not necessarily, continue to have an annual release cycle for the foreseeable future to match the annual release cycle of the SAP S/4HANA system. However, as mentioned, because core Customizing and functionality are covered, the certification won't become obsolete in the immediate future. The same goes for the validity of this book as a reference and for future releases of the certification.

As shown in the SAP Training Web Shop site ([Figure 3](#)), the certification is associate level, which assumes that the exam taker has hands-on experience in a relevant role related to handling SAP production planning and manufacturing (module and has knowledge of the prerequisite education courses.

The screenshot shows the SAP TRAINING website interface. At the top, there is a navigation bar with links for 'Explore catalog', 'SAP Learning Hub', 'SAP Certification', and 'More'. Below the navigation bar is a search bar with the placeholder 'Enter keyword to search for courses, certifications or training paths'. Underneath the search bar, a breadcrumb trail shows 'Certification | SAP Certified Application Associate - SAP S/4HANA Production Planning and Manufacturing'. The main content area displays the certification details for 'C_TS422_2020'. The title is 'SAP Certified Application Associate - SAP S/4HANA Production Planning and Manufacturing'. Below the title, there are two columns of information:

| Delivery Methods: | SAP Certification: | Exam: | Sample Questions: |
|-------------------|--------------------|--|---|
| Level: | Associate | Sample Questions: Cut Score: Duration: Languages: | 80 questions 56% 180 mins English, Chinese |

Figure 3 C_TS422_2020 on the SAP Training Web Shop Site

Scope of the Certification Exams

The book covers the same exact areas and scope as the exams (see [Figure 4](#)) and the academy courses on which the certifications are based.

| Topic Areas | |
|---|------------|
| Please see below the list of topics that may be covered within this certification and the courses that cover them. Its accuracy does not constitute a legitimate claim; SAP reserves the right to update the exam content (topics, items, weighting) at any time. | |
| Advanced Planning in SAP S/4HANA | > 12% > |
| Production Orders in SAP S/4HANA | > 12% > |
| Master Data in SAP S/4HANA | > 12% > |
| Material Requirements Planning in SAP S/4HANA | 8% - 12% > |
| Lean Manufacturing in SAP S/4HANA | 8% - 12% > |
| Capacity Planning in SAP S/4HANA | 8% - 12% > |
| Demand Management in SAP S/4HANA | < 8% > |
| Introduction to SAP S/4HANA Production Planning | < 8% > |
| Introduction to SAP S/4HANA Supply Chain Planning | < 8% > |
| Process Orders in SAP S/4HANA | < 8% > |

Figure 4 Topic Areas for C_TS422_2020 and C_TS422_1909

The approximate weightage and approximate number of questions you can expect per area are detailed in [Table 1](#).

| Book Chapter | Topic | Percentage (%) | Approximate Number of Questions |
|--------------|---------------------------------------|----------------|---------------------------------|
| 1 | Introduction to supply chain planning | < 8% | 5 |

| Book Chapter | Topic | Percentage (%) | Approximate Number of Questions |
|---------------------|--------------------------------------|-----------------------|--|
| 2 | Master data | > 12% | 13 |
| 3 | Demand management | < 8% | 6 |
| 4 | Material requirements planning (MRP) | 8%–12% | 10 |
| 5 | Production orders | > 12% | 13 |
| 6 | Lean manufacturing | 8%–12% | 6 |
| 7 | Process orders | < 8% | 5 |
| 8 | Capacity planning | 8%–12% | 10 |
| 9 | Advanced planning | > 12% | 12 |

Table 1 Topic Weightage

SAP Training and Adoption Courses

You can select from different course options to gain the knowledge required for the certification exams. You also have multiple options for the way you'd like to learn each course.

Standard Certification C_TS422_2020

The following options are available:

- **Individual courses**
 - S4200 (SAP S/4HANA 2020) - Business Processes in SAP S/4HANA Manufacturing
 - S4210 (SAP S/4HANA 2020) - Basic Data for Manufacturing and Product Management in SAP S/4HANA
 - S4220 (SAP S/4HANA 2020) - Production Planning in SAP S/4HANA
 - S4225 (SAP S/4HANA 2020) - Production Orders in SAP S/4HANA
 - S4230 (SAP S/4HANA 2020) - Capacity Planning in SAP S/4HANA
- **Academy courses**
 - TS421 (SAP S/4HANA 2020) - SAP S/4HANA Production Planning and Manufacturing I
 - TS422 (SAP S/4HANA 2020) - SAP S/4HANA Production Planning and Manufacturing II
- **Blended Learning Academy Course**
 - WS4HPP - Manufacturing in SAP S/4HANA (PP) - SAP Blended Learning Academy

[»] Note

The individual courses are also available as e-learnings; just add an “e” to the end of the course names: S4200e, S4210e, and so on.

If you’re new to the subject of production planning with SAP or SAP S/4HANA itself, then it’s a good idea to check the prerequisite

courses such as S4H00e SAP S/4HANA Overview and DSCM1 Digital Supply Chain – From Design to Operate.

For all these courses, the latest materials as of the date of publishing for this book are in collection 17 and refer to SAP S/4HANA 2020.

[»] Note

Collections are course version numberings that generally map a course to a specific product release.

Always go for the newest collection of materials available. You can find the newest material referenced in the relevant learning journey ([Figure 5](#)). The scope of the content for these courses isn't due to change dramatically, but each version of the course gets a little better, as is true for the product as well.

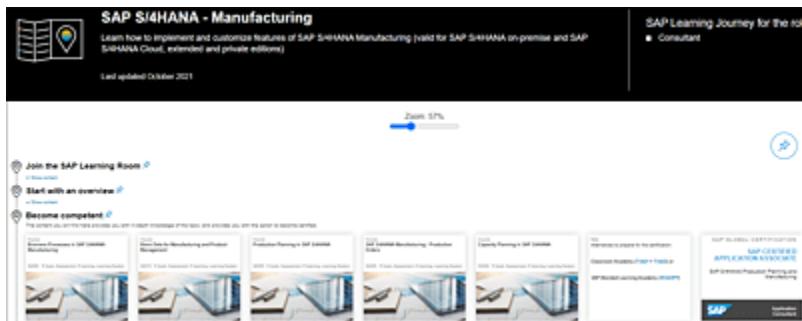


Figure 5 SAP S/4HANA: Manufacturing

To stay up to date on which learning materials are available for production planning and manufacturing in SAP S/4HANA, you should check the corresponding learning journey. Here you see the offerings categorized in sections. The learning journey is interactive, so if you click on the course link, you'll get the latest version of the respective course. If you have an active SAP Learning Hub subscription, you'll be taken directly to the course materials (choose **eBook** or **eLearning**). Assessment questions are also available for

each course. Finally, there is a link to SAP Live Access, which provides a PDF document with all relevant exercises and details on booking an SAP Live Access training system for practice.

Ways to Learn

You can choose to learn and consume the standard SAP Training and Adoption courses in different ways:

- **Classroom training**

This is the most obvious way to learn, especially if you're new to the subject. The inherited and undeniable advantages are an environment that provides immediate live feedback from an expert trainer, networking with other participants with whom you can share your goals, and a system at your disposal to perform exercises during the training. At an SAP training center, you'll receive your printed version of the relevant course material (one for each individual course or each week of the academy). You can search for virtual or classroom training courses in your area on the SAP Training and Adoption website at:

<https://training.sap.com/certification>.

Classroom training is offered as two separate 10-day sessions to prepare for the TS422 certification, as shown in [Figure 6](#).

- TS421 (SAP S/4HANA 2020)

- TS422 (SAP S/4HANA 2020)

The screenshot shows the SAP Learning Hub interface for course TS421. At the top, it displays the course title 'SAP S/4HANA Production Planning and Manufacturing I'. Below the title, there is a summary section with the following details:

- Delivery Method:** Classroom
- Duration:** 30-days
- Level:** Consultant Academy Training
- Languages:** English

Below this summary, there is a 'Solution Release' section indicating 'SAP S/4HANA 2020' and a 'Find a course date' button. The main content area is titled 'Course announcements' and contains a descriptive paragraph about the course's purpose and content. Under 'Course information', there is a 'Content' section with a list of topics:

- Course book 1 (out of 2):
 - Master Data for Production
 - Material
 - Bill of Material (BOM)

Figure 6 Academy Course TS421: First of Two Courses for TS422 Certification

You can take virtual or classroom courses for individual courses; for example, you can search for “S4220”, as shown in [Figure 7](#).

- **SAP Blended Learning Academy**

This is a recent addition to the SAP Training offerings. This guided and modular training lasts for two to four months. It's a combination of an SAP virtual learning class and a virtual option session, which is moderated by SAP instructors and trainers, and a self-study with SAP Learning Hub, which concludes with the certification. You can access the SAP Blended Learning Academy at <http://s-prs.co/v218511> (see [Figure 8](#)).

- **Course WS4HPP**

This is the course for Manufacturing in SAP S/4HANA (PP) in the SAP Blended Learning Academy. It starts with a one-day virtual kick-off session and four virtual review events that span approximately one month apart with one day each to review the

learning parts. These virtual sessions are moderated by SAP instructors. The details are given in [Figure 9](#).

Find a course date

Country: Please select | Timeframe: Showing all | Language: Showing all | Delivery method: Showing all

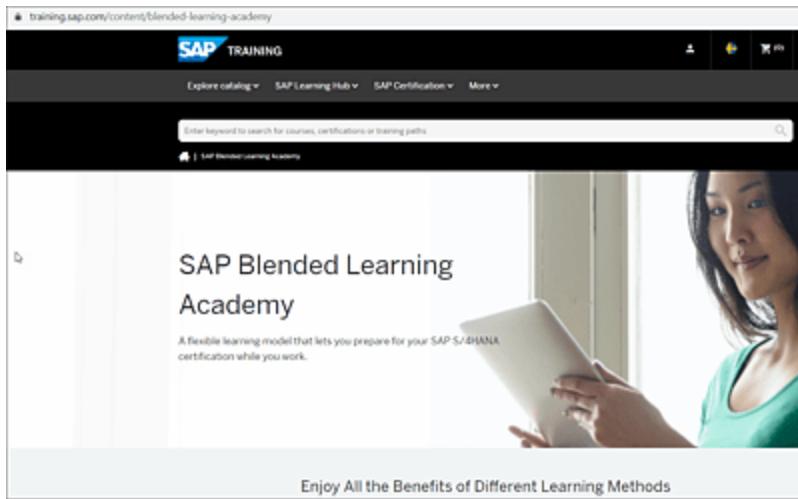
Guaranteed to run (GTR) (?)

[Sweden](#) [Clear all filters](#) [Download](#)

Displaying 4 / 4

| Course | Date(s) | Location | Language | Price |
|--|--|---|----------|---|
| S4220 - Production Planning in SAP S/4HANA SAP S/4HANA 2020 | 21 Feb 2022 - 25 Feb 2022 <small>Show class times</small> | SAP Learning Class, virtual option - Sweden, Sweden Virtual Training | English | 37430.00 kr (SEK) Price excludes tax |
| S4220 - Production Planning in SAP S/4HANA SAP S/4HANA 2020 | 16 May 2022 - 20 May 2022 <small>Show class times</small> | SAP Learning Class, virtual option - Sweden, Sweden Virtual Training | English | 37430.00 kr (SEK) Price excludes tax |
| S4220 - Production Planning in SAP S/4HANA SAP S/4HANA 2020 | 8 Aug 2022 - 12 Aug 2022 <small>Show class times</small> | SAP Learning Class, virtual option - Sweden, Sweden Virtual Training | English | 37430.00 kr (SEK) Price excludes tax |
| S4220 - Production Planning in SAP S/4HANA SAP S/4HANA 2020 | 14 Nov 2022 - 18 Nov 2022 <small>Show class times</small> | SAP Learning Class, virtual option - Sweden, Sweden Virtual Training | English | 37430.00 kr (SEK) Price excludes tax |

Figure 7 Individual Course Search in a Country Area



The screenshot shows the SAP Blended Learning Academy homepage. At the top, there's a navigation bar with links for 'Explore catalog', 'SAP Learning Hub', 'SAP Certification', and 'More'. Below the navigation is a search bar with the placeholder 'Enter keyword to search for content, certificates or training paths'. A banner at the top features a woman holding a tablet and the text 'SAP Blended Learning Academy' and 'A flexible learning model that lets you prepare for your SAP S/4HANA certification while you work.' At the bottom of the page, a call-to-action button says 'Enjoy All the Benefits of Different Learning Methods'.

Figure 8 SAP Blended Learning Academy

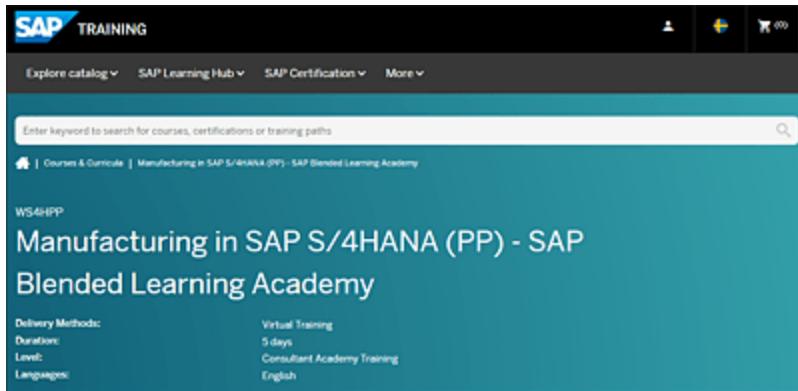


Figure 9 WS4HPP: Manufacturing in SAP S/4HANA (PP) from the SAP Blended Learning Academy

- **SAP Learning Hub (<https://learninghub.sap.com/>)**

This is a cloud-based offering with an annual subscription that includes the following:

- Access to *learning content* such as learning journeys, e-books, recorded demo simulations, videos, and so on.
- Access to the *SAP Learning Rooms* which are expert-led social learning forums. There you can ask questions, interact, and find materials and links. The *SAP S/4HANA Enterprise Management Learning Room* is the relevant learning room for production planning and manufacturing topics.
- Access to *SAP Live Access*, which enables SAP Learning Hub subscribers to work with fully configured SAP software systems to carry out class exercises, cross-train, and experiment. When you use SAP Live Access, your system environment is specifically configured for the course you're studying. There's no system setup on your side—just launch and learn with a system designed specifically to accompany your training course content and exercises. You can purchase access in blocks (contingents) of 20 hours. Each block gives you up to 30 days to carry out exercises or explore the fully configured system.

Tips for Taking the Certification Exam

Let's now go through some tips that will help you better prepare for the exam. Studying the course material is the key to passing the certification, but we'll also analyze the types of questions you'll answer and finally list some tips and tricks for using before and during the exam.

Some General Considerations

The main objective of this book is to help you pass one of the certifications for SAP S/4HANA production planning and manufacturing. This isn't the same as preparing for a consulting project. Although the requirements for the exam and consulting overlap to a large extent in practice, and SAP publishes materials with content and exercises that are relevant for consultants, you should remember that certification at the application consultant level tests knowledge of the specific materials on which it's based. In other words, although your own experience will contribute greatly to your success in certification and is probably the most important indicator of real-world skills, it's not enough for certification. For certification, knowledge and understanding of the materials and scope of the course is most important.

In any case, we want to invite you to study the teaching materials. The exam is certainly not a memorization exercise, but it's based on the content of the books.

The Question Types

As already mentioned, the exam consists of multiple-choice and multiple-selection questions. For all questions, the answers must be

derived directly or easily from the content of the course book. In this section, we'll look at an example from each category based on the sample questions on the certification exam page.

The multiple-choice question type is the most straightforward and is usually a very specific question with a single very specific answer. In the sample question shown in [Figure 10](#), you're asked when the days are counted backwards. To answer this, you need to know the meaning of and thoroughly understand planning strategy 70.

The screenshot shows a SAP certification exam interface. At the top, it says "SAP Consultant Certification". Below that, it shows the date "Oct 19 2021" and the user "Logged in as : Sample". The title of the question is "SAP S/4HANA Production Planning and Manufacturing (C_TS422)". The question text is: "A material in your company is planned with planning strategy 70 (Planning at assembly level). The consumption mode has been set to backward with a consumption period of 12 days. Starting from when are the 12 days counted backwards?". There are four options to choose from:

- From the requested delivery date of the related finished good
- From the availability date of the related finished good
- From the planned independent requirement date of the material
- From the dependent requirement date of the material

Figure 10 Multiple-Choice Question Example

SAP avoids adding scenario information to a question. Most of the time, every element of a question is important, so read the question carefully and even twice or more to make sure you have it. You have enough time for this.

[Figure 11](#) shows a sample multiple-choice question where you must select two of four options as correct. You must select both correct answers to have the answer marked as correct. SAP doesn't award points for half a correct answer. The example question here is

correct if you select both **Storage location data** and **Warehouse number data**.

The screenshot shows a SAP S/4HANA Consultant Certification interface. At the top, it says "SAP Consultant Certification". Below that, it shows "Oct 19 2021 | Logged in as : Sample". The main title is "SAP S/4HANA Production Planning and Manufacturing (C_TS422)". A question is displayed: "Which material master data can you copy when you use the Copy Material program (transaction MM02, Material Master Copier) to create new materials? Note: There are 2 correct answers to this question." Below the question are four options, each preceded by a checkbox:

- Storage location data
- Warehouse number data
- MRP area data
- Production version data

Figure 11 Multiple-Selection Question Example 1

One level higher on the difficulty ladder is the multiple selection question with three out of five correct answers, as shown in [Figure 12](#). An additional answer option adds another parameter to be considered and thus increases the probability that the question will be answered incorrectly. In addition, it usually takes a little longer to simply read through and assimilate everything. If you're sure of an answer, then it's correct, so don't reconsider it. If you mark down the ones you're sure of, you're left with an easier question. You know that one answer is correct, so now you have a two out of four question instead of a three out of five question. When you know two answers for sure, you're left with one out of three questions. It seems obvious, but eliminating options is the best way to get them out of your mind. The same applies to wrong answer options. Writing wrong answers is a challenge, so take advantage of it: if something appears out of place, you should know that it probably is. If the direct knowledge approach doesn't work, continue with the process of

elimination. Knowing what is wrong is as important as knowing what is right for certification.

The screenshot shows a SAP Consultant Certification exam interface. At the top, there's a yellow header bar with the SAP logo and the text "Consultant Certification". Below it, a white header bar displays the date "Oct 19 2021 | Logged in as : Sample" and the exam title "SAP S/4HANA Production Planning and Manufacturing (C_TS422)". A progress bar indicates "10 of 10". The main content area contains a question: "You are creating a production order manually. What activities are involved in this process? Note: There are 3 correct answers to this question." Below the note is a list of five options, each preceded by a checkbox:

- Planning selection
- Master data selection
- Capacity requirements determination
- Order type determination
- Actual cost calculation

Figure 12 Multiple-Selection Question Example 2

You have three hours to go through all the exam questions. This gives you more than two minutes per question. The questions are designed to be readable in an average of 30 seconds, giving you enough time to work through the entire exam. Stay relaxed and don't worry about the time. Focus on the question at hand, and if you're not sure of the answer, continue. The system keeps track of the unanswered questions. Always answer all questions as best you can before you submit the final exam. There is no penalty for incorrect answers, so not submitting an answer is a wasted opportunity.

SAP allows you to repeat the exam up to three times. Both the order of the questions and the order of the answers in a question are randomized. You won't get new questions if you repeat the exam, but the questions will be reshuffled.

Tips and Tricks

The following are some useful tips when preparing for the exam:

- Bulleted lists in course materials are a favorite source for creating questions, so be aware.
- Use the exam questions in the course materials or in this book to evaluate your knowledge of a topic. If you don't understand something, reread the relevant section, check the correct answer details, and, if necessary, post a question in an online forum or community.
- There is a lot to learn and understand, so take your time.
- Don't spend too much time answering so-called certification questions outside of official SAP resources. These aren't always written correctly, and you have no guarantee of correct answers. The SAP Learning and Adoption courses and this book contain many test questions.
- Work on the system as much as possible. In addition to the exercises offered with the SAP courses, you can reproduce the examples, processes, and configurations presented in this book. It sometimes helps enormously to understand the theory.

Here are some recommendations to consider for use during the exam:

- Answer all questions and bookmark the ones you're not sure about so you can work on them again.
- Don't worry too much about time. In most cases, you can go through the questions two or three times if you want.
- Read questions and answers very carefully.
- Eliminate the answer options that make no sense or are obviously wrong. Usually, one of the wrong answers stands out as wrong, and the fewer options you have, the better chance you have of choosing the right one.

Additional Learning Resources

There's no doubt that it's important to acquire knowledge to pass a certification exam: a certification is valuable in the job market, and it confirms at least a certain level of knowledge. But especially in the IT area, innovation never stands still. The following resources are useful not only to prepare for a certification but also in general to learn more and keep your knowledge up to date:

- **Stay Current materials**

Stay Current materials are created and provided by SAP Training and Adoption in direct cooperation with the development departments and are available on the SAP Learning Hub.

- **SAP Best Practices Explorer**

The SAP S/4HANA system deployment and the SAP Activate implementation methodology are closely integrated with SAP Best Practices. SAP Best Practices consist of preconfigured and documented business process scenarios you can review in the SAP Best Practices Explorer at <https://rapid.sap.com/bp/>.

- **SAP Help Portal**

You can use the SAP Help Portal at <http://s-prs.co/v218512> as a single point of entry to find help content, product documentation,

simplification lists, FAQs, compatibility information, and more, as shown in [Figure 13](#).

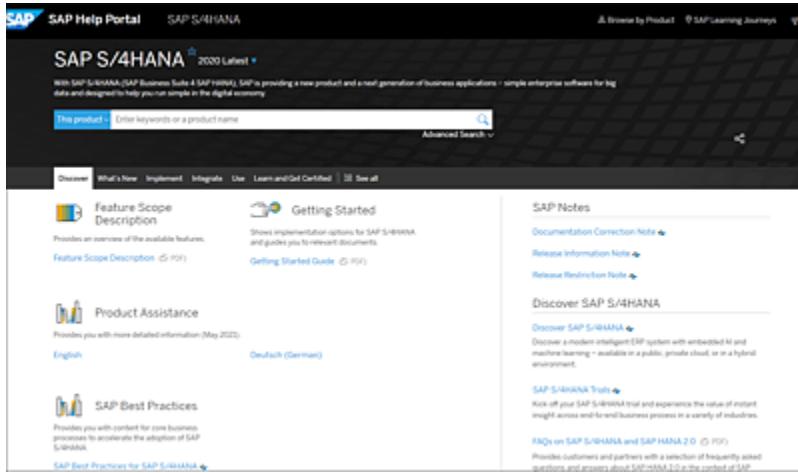
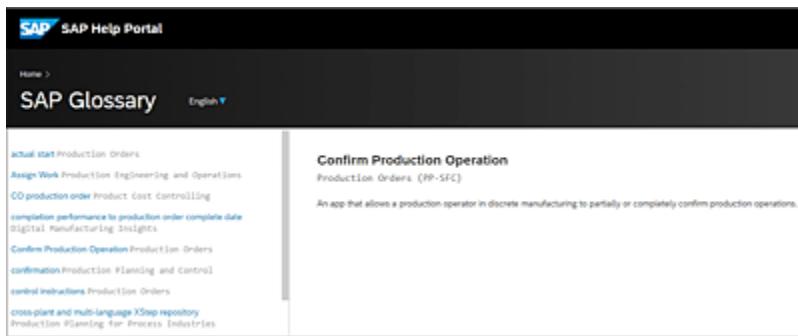
The screenshot shows the SAP Help Portal homepage for SAP S/4HANA. At the top, there's a navigation bar with links for 'SAP Help Portal', 'SAP S/4HANA', 'Browse by Product', and 'SAP Learning Journeys'. Below the header, a banner for 'SAP S/4HANA 2020 Latest' is displayed, stating 'With SAP S/4HANA (SAP Business Suite & SAP HANA), SAP is providing a new product and a next generation of business applications - simple enterprise software for big data and designed to help you run simple in the digital economy'. A search bar with placeholder text 'Enter keywords or a product name' and a 'Advanced Search' button are located below the banner. The main content area features several sections: 'Discover What's New', 'Implement', 'Integrate', 'Use', 'Learn and Get Certified', and 'See all'. Under 'Discover What's New', there are links for 'Feature Scope Description' (PDF), 'Getting Started Guide' (PDF), 'Product Assistance' (PDF), and 'SAP Best Practices' (PDF). On the right side, there's a 'SAP Notes' section with links for 'Documentation Correction Note', 'Release Information Note', and 'Release Reversion Note'. Below that is a 'Discover SAP S/4HANA' section with links for 'Discover SAP S/4HANA', 'SAP S/4HANA TryIt', and 'FAQs on SAP S/4HANA and SAP HANA 2.0' (PDF).

Figure 13 SAP Help Portal

- **SAP Glossary**

SAP Glossary (<https://help.sap.com/glossary>) is a web-based database that includes short descriptions of SAP terminology used in SAP applications and in SAP Help Portal, as shown in [Figure 14](#).

The screenshot shows the SAP Glossary page. The top navigation bar includes 'Home', 'SAP Glossary', and a language selector set to 'English'. The main content area has two columns. The left column contains a sidebar with terms like 'actual start Production Orders', 'Assign Work Production Engineering and Operations', 'CO production order Product Cost Controlling', 'completion performance to production order complete date', 'digital manufacturing insights', 'Confirm Production Operation Production Orders', 'confirmation Production Planning and Control', 'control instructions Production Orders', 'cross-plane and multi-language XERP repository', and 'Production Planning for Process Industries'. The right column displays a detailed entry for 'Confirm Production Operation':

Confirm Production Operation
Production Orders (PP-SFC)
An app that allows a production operator in discrete manufacturing to partially or completely confirm production operations.

Figure 14 SAP Glossary

- **openSAP**

openSAP (<https://open.sap.com>) is a web-based learning environment that offers online courses made available by SAP over the internet free of charge for everyone. As shown in

Figure 15, openSAP Microlearning includes self-contained videos that fit your individual learning goals. openSAP Podcasts includes podcasts on topics relevant to your business and personal interests. You can download or stream episodes with Apple Podcasts, Spotify, and TuneIn.

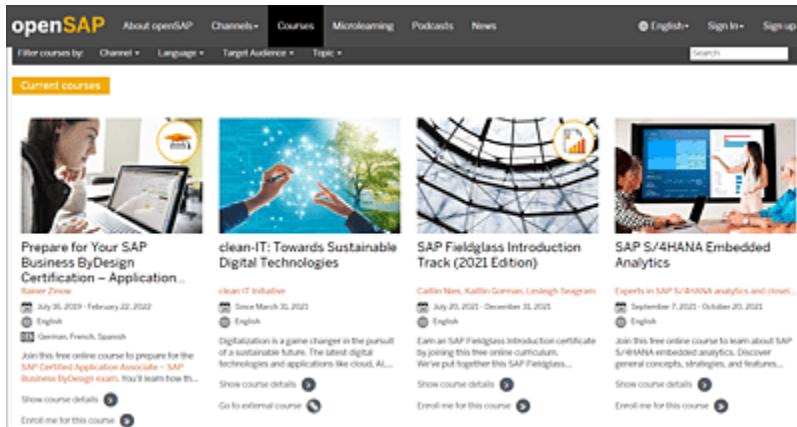
A screenshot of the openSAP website's course catalog page. The top navigation bar includes links for About openSAP, Channels, Courses, Microlearning, Podcasts, News, English, Sign In, and Sign up. Below the navigation is a search bar and filter options for Channel, Language, Target Audience, and Topic. A section titled "Current courses" displays four course cards: 1. "Prepare for Your SAP Business ByDesign Certification – Application..." (July 26, 2020 - February 22, 2021) 2. "clean-IT: Towards Sustainable Digital Technologies" (July 26, 2020 - March 31, 2021) 3. "SAP Fieldglass Introduction Track (2021 Edition)" (July 26, 2020 - December 31, 2021) 4. "SAP S/4HANA Embedded Analytics" (September 7, 2021 - October 20, 2021). Each card includes a thumbnail image, course title, duration, language, and enrollment links.

Figure 15 openSAP

- **SAP Fiori apps reference library**

In the SAP Fiori apps reference library at <http://s-prs.co/v218513>, you get key information for each SAP Fiori app, including all the technical data you need for installation and configuration.

Summary

You now understand the SAP S/4HANA certification options available for production planning and manufacturing in SAP S/4HANA. You are now able to find out the exam structure, subject weighting, and minimum score required for each exam. You know which SAP Training and Adoption courses you can review or attend for your certification exam and which SAP programs and resources complement and enhance your knowledge and skills.

In the next chapters, we'll dive directly into the exam topics, starting with an introduction and overview of SAP S/4HANA and an introduction to Supply Chain Planning.

1 Introduction to Supply Chain Planning

Techniques You'll Master

- Explain the SAP strategy for digital transformation
- Describe the relevant options for SAP S/4HANA
- Review SAP Fiori design
- Understand SAP Activate framework
- Review the history and evolution of production planning in SAP S/4HANA
- Understand the basics of supply chain planning

In this chapter, we'll explore the SAP HANA architecture and database, various deployment options and scope of SAP S/4HANA, basic functions of the SAP Fiori user experience (UX), the SAP Activate methodology, and aspects of SAP supply chain planning.

Real-World Scenario

As a consultant, you should understand that SAP S/4HANA is the new architectural direction and is a separate product line from SAP ERP. SAP S/4HANA is the core of SAP's strategy, and you should feel comfortable in explaining the benefits this new technology platform will bring. SAP HANA is a database where the system response and transaction processing is fast. Fast doesn't always mean good, but how SAP fundamentally changed and simplified business processes, embedded analytics and on-the-fly

reporting, and revamped the user experience (UX) with SAP Fiori are some of the features you can proudly share with customers.

The fundamental shift in SAP HANA architecture and fast database, as well as many other features, enabled the most system resource-intensive processes performed in a tenth of the time. Because of these capabilities many of the supply chain planning capabilities have now been moved to the SAP S/4HANA core.

SAP is enabling digital transformation, and more and more customers are adopting to SAP S/4HANA and intelligent enterprise solutions for better return on investment and future proofing.

1.1 Objectives of This Portion of the Test

The purpose of this portion of the certification exam is to test your knowledge in SAP HANA, SAP S/4HANA, SAP Fiori apps, the SAP Activate methodology, and the latest trends in SAP supply chain planning. The certification exam expects you to have a good understanding of the following topics:

- Overview of SAP HANA architecture
- Deployment options for SAP S/4HANA
- SAP Fiori design principles, features, and app types
- SAP Activate framework

- SAP supply chain planning trends and available solutions

[»] Note

SAP S/4HANA essentials and introduction to SAP supply chain planning covers more than 8% of questions in the certification exam.

1.2 Digital Transformation and the Intelligent Enterprise

The internet, accessible data, mobile technology advancements, computing power in the hands of consumers, fast-emerging technologies, and rapid innovations have changed the way users are handling their devices. Users expect for simplicity, flexibility, and superior UXs from technology providers. These advancements in the technology space are fueling the advent of new ways of doing business and connecting with customers. Now it's imperative for businesses to adapt to the fast-emerging digital technologies, such as mobile, big data, artificial intelligence (AI), Internet of Things (IoT), and so on, and transform the way they do businesses to be relevant in the market space. Digital is no longer just a support function; digital transformation is the key driver and partner in business transformation.

Across the globe, almost all businesses are at some level of digital transaction. If not started, then it's high on their agenda. This trend in adoption of new technologies and increased complexity in the business space is also putting pressure on businesses to rethink the processes across all business functions to simplify, automate, and adopt to be the front-runners. At the same time, expectations for business application software providers have also increased tremendously to support the digital transformation. SAP is committed to and investing heavily in all aspects of digital enterprise and has developed a strategic framework that comprises business processes, technologies, and platforms. SAP's strategy to support intelligent enterprise is based on the following, as shown in [Figure 1.1:](#)

- **Intelligent suite**

To support end-to-end business processes, the intelligent suite represents SAP S/4HANA as a digital core (including the SAP S/4HANA Enterprise Management, or simplified core), and cloud-based SAP S/4HANA Line-of-Business (LoB) Solutions all seamlessly integrate with SAP S/4HANA. The SAP S/4HANA LoB Solutions are as follows:

- SAP Integrated Business Planning for Supply Chain (SAP IBP) and SAP Digital Manufacturing Cloud (for manufacturing and supply chain)
- SAP Customer Experience (for customer experience)
- SAP SuccessFactors (for people management)
- SAP Ariba, SAP Fieldglass, and SAP Concur (for network and spending management)

- **Intelligent technologies**

The intelligent technologies, which include AI, IoT, machine learning, and blockchain, enhance the intelligent enterprise's capabilities.

- **Industry cloud**

To drive sustainable and profitable business transformation, SAP industries can provide the innovative, interoperable solutions built by SAP and its partners. These solutions are industry specific and

will fully integrate with the end-to-end business processes (e.g., industry cloud solutions for the automotive industry).

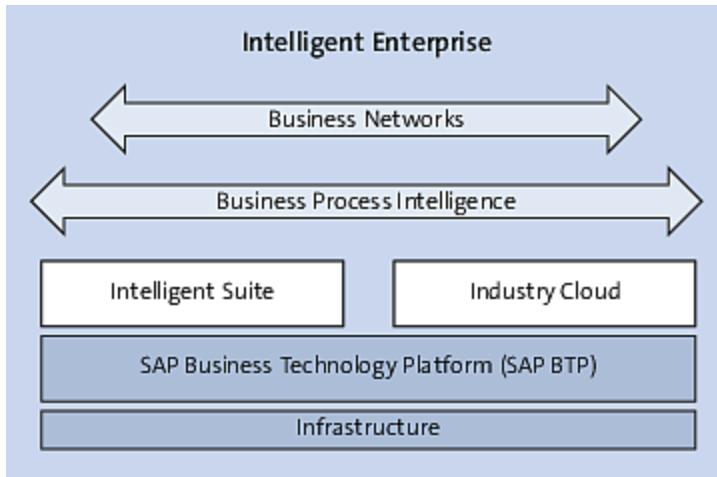


Figure 1.1 Intelligent Enterprise Framework

- **SAP Business Technology Platform (SAP BTP)**

SAP BTP is the foundation on which the intelligent suite is built and is the fundamental business technology layer (see [Figure 1.2](#)), which consists of the following:

- Database and data management component comprising SAP HANA as the database foundation. Data management is supported with SAP Master Data Governance and various other tools to manage all facets of data management, especially context-relevant data that is gaining importance across the enterprise.
- Analytics component enabling embedded analytics with business intelligence, data warehousing, and enterprise planning.
- Application development and integration component enabling cloud application development and integration capabilities to enhance, extend, and integrate enterprise delivered through the cloud-based platform.

- Intelligent technologies component enhancing business processes with artificial intelligence and SAP Intelligent Robotic Process Automation.

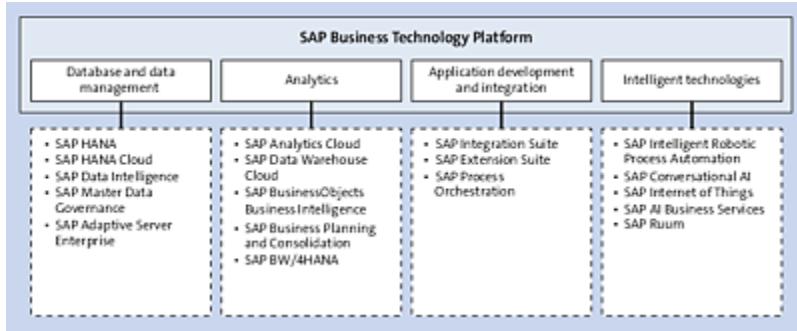


Figure 1.2 SAP Business Technology Platform and Components

SAP HANA is the new generation database management system, which combines both online transaction processing (OLTP) and online analytical processing (OLAP) capabilities. SAP HANA has capabilities to perform advanced analytics and application development services, which support many programming languages.

The key features of SAP HANA are as follows:

- The SAP HANA in-memory database uses primary memory (RAM) to store more data than the conventional disk-only storage mechanism. Data access from the memory is many times faster than the traditional databases, but expensive. So, to mitigate the high costs, SAP adopted an approach called dynamic tiering, where the frequently accessed data is stored in memory, and the less frequently accessed data is stored on disk.
- Compression of data in SAP HANA databases occurs up to the factor of 10. With the conventional compression data, speed is compromised. Compressing and decompressing requires a lot of processor power, so SAP HANA uses many techniques to compress the data. One among them is the insert-only option. With this option, the old data will never be overwritten, but it's

always appended. For a given data set, always the latest version is read based on the query execution time stamp.

- SAP HANA is optimized for columnar storage but supports both column and row tables. Higher data compression rates can be achieved with columnar storage because of ranges of the same values in the contiguous memory. With operations on single columns, higher performance can be achieved. The columnar structure and data stored in columns already works like having a built-in index at the column level. Common misinformation is that SAP HANA doesn't use indexes, but primary key fields will always have indexes. It's also possible to create new indexes. As the columnar structures are already partitioned, processing of data in multiple processor cores is simplified.

1.3 SAP S/4HANA

SAP S/4HANA is the current ERP solution from SAP and is written specifically to run only on the SAP HANA platform, which removed redundant data models, application data, and technologies. SAP S/4HANA provides all the baseline functionalities such as production planning, materials management, sales and distribution, finance, and so on. To reduce the redundancy, many simplifications are introduced in almost all the functional areas. SAP S/4HANA can provide real-time analytics. This section covers deployment options for SAP S/4HANA, as well as the history and evolution of production planning in SAP S/4HANA.

1.3.1 Deployment Options

Based on the business requirements, the IT architecture, strategy, total cost of ownership, and so on, a suitable deployment option can be selected. SAP supports various deployment options, as follows:

- **SAP S/4HANA**

This was formerly known as SAP S/4HANA, on-premise edition. This deployment option provides flexibility in customization and changes to the software. Based on the IT strategy and business requirements, this edition can be deployed in your business's own data centers near to the business operations, for example, near to the manufacturing facility due to latency issues/system responsiveness requirements, or it can be deployed on the cloud (hyperscalers, e.g., Microsoft Azure, Amazon Web Services [AWS], Google etc.) or on any other infrastructure as a service (IaaS) service provider. Your organization is responsible for both hardware and software operations, updates, upgrades, access

management, system availability, and system stability. The innovations are delivered on an annual basis, but it's up to your organization when to deploy and adopt them. The naming convention for on-premise editions is SAP S/4HANA.

- **SAP S/4HANA Cloud, extended edition**

This edition was formerly known as the private cloud edition or single tenant cloud edition. In comparison to the on-premise edition, this edition has the flexibility to perform the customization but the code modification isn't allowed. The infrastructure can be hosted on either the SAP cloud or hyperscaler, or any other hosting service providers. The maintenance and upgrades are performed by the hosting company. You can influence when to perform the updates.

- **SAP S/4HANA Cloud**

SAP S/4HANA Cloud provides the standard core processes and functionalities, but the scope isn't as extensive as the on-premise edition. This edition is called SAP S/4HANA Cloud, SAP S/4HANA public cloud, or SAP S/4HANA multitenant cloud. The applications and the platform are used by many other companies, so the total IT costs will be less in this case. The innovations are delivered quarterly, and the hosting company is responsible for maintaining and updating the software and infrastructure.

Both SAP S/4HANA Cloud and SAP S/4HANA Cloud, extended edition, are referred to as SAP S/4HANA Cloud.

[»] Note

The certification exam and the topics covered in this book are aligned with the SAP S/4HANA AnyPremise edition, which was previously known as the on-premise edition.

SAP S/4HANA system is a new product line, which means there are some incompatible changes between SAP S/4HANA and SAP ERP. There are three major options for customers to choose from to move to SAP S/4HANA:

- **New implementation**

Customers with older versions of SAP or non-SAP systems (legacy systems) can implement SAP S/4HANA by redesigning their processes and data. If the legacy SAP ERP system is highly customized and not suitable for any other adoption methods or technical system, conversion may go for this *greenfield implementation*. The advantages with this approach are process reengineering and simplifications based on out-of-the-box preconfigured business processes, predefined migration objects, and tools for data migration for rapid adoption.

- **Landscape transformation**

With landscape transformation, customers can consolidate their dispersed systems into one consolidated SAP S/4HANA system or split out of different parts of the system. This option is predominantly a data migration approach into the new SAP S/4HANA system, which was implemented by the greenfield approach or system conversion.

- **System conversion**

This is a technical conversion of older SAP ERP systems to a new SAP S/4HANA system. The real benefit with this approach is quick movement to the new SAP S/4HANA system without high reimplementation efforts. After the system conversion, adoption of process simplifications and SAP Fiori can be achieved gradually.

1.3.2 Production Planning in SAP S/4HANA

For an SAP production planning consultant, it's always better to know and understand the evolution of features added in SAP S/4HANA with reference to production planning. The details of the topics and simplifications are discussed in detail in the specific topic chapters. Every year, there have been additions to planning functionalities. The following list provides an overview of this, which is also shown in [Figure 1.3](#):

- SAP S/4HANA release 1511 is the first release where logistics modules are included, along with major simplifications. If you don't want to implement any new functionalities during SAP ERP to SAP S/4HANA migration, then you should understand and implement the simplifications. With simplifications, SAP removed/altered some of the functionalities and provided better ways of handling the transactions and features, as follows:
 - The material requirements planning (MRP) area is the default option for planning subcontracting and storage location MRP.
 - The planning file is simplified.
 - Sourcing is simplified both for in-house production and external procurement. The source list is no longer the object that determines the source of supply. This now matches the data and sourcing model of production planning and detailed scheduling (PP-DS).
 - The production version is mandatory for MRP runs and for production execution, as well as phantom assemblies and materials involved in the subcontracting process.
- With the SAP S/4HANA 1610 release, embedded PP-DS). is introduced in the SAP S/4HANA core. With this addition, the Core Interface (CIF) has been simplified, and master data is

harmonized. With the MRP dispatcher logic, MRP Live can automatically determine whether to execute a classic MRP run, an MRP Live run, or an advanced planning run (PP-DS).

- Demand-driven material requirements planning (DDMRP) is the major feature introduced with the SAP S/4HANA 1709 release. This concept is developed by the Demand Driven Institute (DDI), which we'll discuss more in detail in [Chapter 9](#).
- With the SAP S/4HANA 1909 release, the major feature predictive material and resource planning (pMRP) is introduced. This is the successor of long-term planning (LTP). In SAP ERP, LTP was used for simulations. Even though LTP is currently available in SAP S/4HANA, no improvements will be delivered, and it no longer considered for future architecture. pMRP is discussed in the [Chapter 9](#).

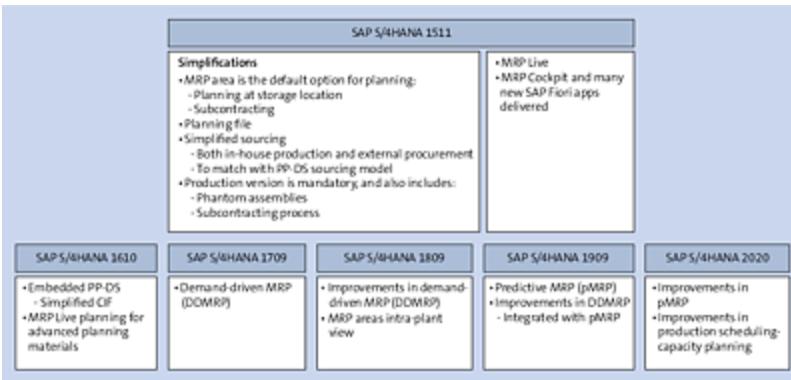


Figure 1.3 Evolution of Production Planning in SAP S/4HANA

1.4 SAP User Experience

User experience (UX) plays a significant part in the success of any software application. The biggest complaint from SAP customers is the UX. With the changing business context and digitization, an intuitive and simple user interface (UI) is needed. The gap between work software (enterprise software) and any other apps used by users for personal reasons should be reduced. So, SAP made an effort to close this gap with SAP Fiori by introducing a web-based (browser-based) and mobile-enabled interface focused on improving the UX and productivity.

SAP Fiori isn't a replacement for SAP GUI or SAP NetWeaver Business Client, but a new UX for SAP. With SAP S/4HANA, all the UIs—SAP GUI, SAP NetWeaver Business Client, and SAP Fiori—are available and can be used. In fact, SAP GUI transactions can also be accessed directly from SAP Fiori.

App development in SAP Fiori is based on the SAPUI5 framework. This is in turn based on the OpenUI5 framework. Mainly open-source software and open standards are used for SAP Fiori development for broad-based acceptance and competence levels, and the developed apps are compatible with multiple-device platforms. In this section, we'll cover SAP Fiori design principles as well as the SAP Fiori launchpad and SAP Fiori app types.

1.4.1 SAP Fiori Design Principles

The SAP Fiori design philosophy is based on the following principles:

- **Role-based**

The user is the center of SAP Fiori app development. Based on

business roles, apps are created with intuitive designs. The integration is coherent and smooth for navigation from screen to screen without having to reenter necessary data. The user-based apps are structured in the SAP Fiori launchpad based on the daily tasks performed by the users.

- **Simple**

The apps are intuitive and easy to use, without requiring much training to perform daily tasks. To switch from one task to another doesn't require the use of many screens.

- **Coherent**

The look and feel of the screens is consistent throughout all the apps. Irrespective of the area (module or business role), the apps present a coherent and intuitive look, screens, and experience.

- **Adaptive**

SAP Fiori enables you to work wherever you want and from any device, as SAP Fiori adapts to the size of the device. The input methods adjust and provide instant insights and necessary information.

- **Delightful**

SAP Fiori enables users to perform their daily tasks in a simplified way with increased clarity, less ambiguity, and an enriched UX.

1.4.2 SAP Fiori Launchpad

The SAP Fiori launchpad is where users access the apps in one place. These apps can be from different modules or LoB solutions. Custom-built apps can also be accessed from the same place. Based on the job role, needed authorizations are given to users for access to the optimum applications in the launchpad. As shown in

Figure 1.4, SAP Fiori launchpad is a web-based interface that can be customized based on the user role.

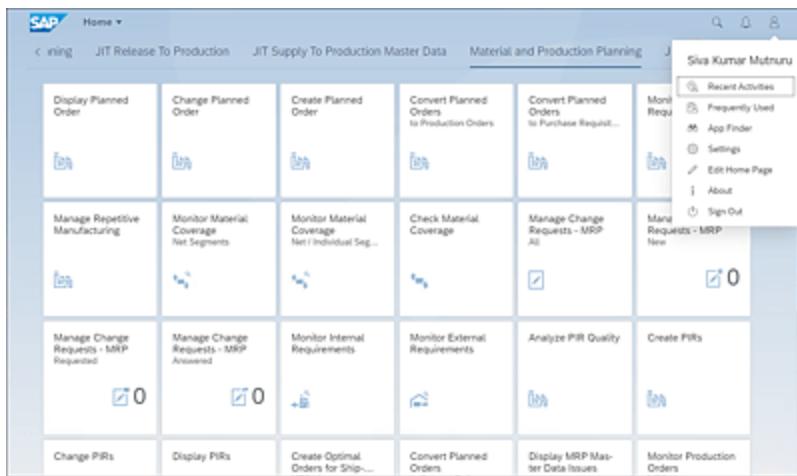


Figure 1.4 SAP Fiori Launchpad: User Actions Menu

SAP Fiori launchpad has enterprise search capabilities that are useful not only for app searches but also for business objects, such as production orders, bills of materials (BOMs), change numbers, classifications, and so on. The user only has to enter the object number, and the details will be available as a search result. By using the user actions menu in the SAP Fiori launchpad, as shown in Figure 1.4 (top-right corner), it's possible to select a design theme and colors, user profiling and personalized search, language and region settings, and notification settings.

By selecting the **Edit Home Page** option in the user action menu, as shown in Figure 1.4, end users can customize the launchpad with apps and app groups by adding, removing, and moving the apps, or by renaming the groups as needed, as shown in Figure 1.5. In edit mode, users can reset the SAP Fiori Launchpad via the **Reset** button.

SAP Fiori apps are organized as SAP Fiori app catalogs, which define the apps a user is authorized to use. The apps can be

displayed in the SAP Fiori launchpad if they are added to a group. Groups can be created by end users or can be managed centrally. So, to have authorizations for appropriate SAP Fiori apps, users should be assigned to the relevant catalogs.

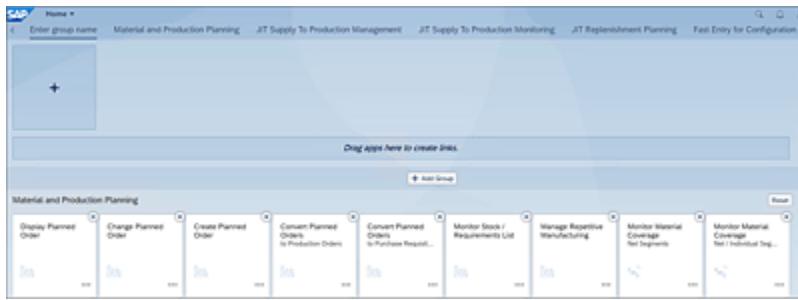


Figure 1.5 Editing the Home Page of SAP Fiori Launchpad

1.4.3 SAP Fiori Application Types

During 2013, for the first time, 25 SAP Fiori apps were released for managers and end users. From then on, thousands of apps have been developed and delivered. You can group the SAP Fiori apps broadly into three categories:

- **Transactional apps**

All the apps that are used for performing any posting or a transaction can be termed as transactional apps. These apps provide task-based functions to perform the specific transactions, which will, in general, be aligned with specific user roles. The apps use SAP ABAP to provide access to SAP S/4HANA on any

database. [Figure 1.6](#) shows an example of a transactional app: Manage Production Orders.

The screenshot shows the SAP Manage Production Orders application interface. At the top, there are search and filter fields for Status (Delivered > 4 More), Issue Type (No Filter), Delay Duration (>= 8 Hours), Order Number (T5402), Material (T5402_FG001), and Scheduled Start. Below the header is a toolbar with buttons for Change Dates and Quantities, Edit, Release, Read Master Data, and Adapt Filters. A table titled 'Orders (4)' lists four production orders:

| Order | Material | Open Quantity | Status | Start | End | Progress of Operation | Issues |
|---------|--|---------------|---------------------|----------------------------|----------------------------|---------------------------------|--------|
| 3460123 | T5402_FG001 Finished Material-T5402_FG001 | 10 PC | Partially Confirmed | Tue, Sep 14, 2021 09:38 | Tue, Sep 14, 2021 16:00 | Assembly (0010) 10.00 ✓ or ✗ | |
| 3460124 | T5402_FG001 T5402_Subassembly | 1 PC | Released | Tue, Feb 23, 2021 07:00 | Tue, Feb 23, 2021 07:33 | Assembly (0020) 1.00 ✓ or ✗ | |
| 3460125 | T5402_FG001 Finished Material-T5402_FG001 | 500 PC | Created | Tue, Sep 7, 2021 07:00 | Sat, Sep 11, 2021 09:00 | Assembly (0030) 0.00 ✓ or ✗ | |
| 3460126 | T5402_FG001 Finished Material-T5402_FG001 | 500 PC | Created | Mon, Sep 8, 2021 07:00 | Fri, Sep 12, 2021 09:00 | Assembly (0040) 0.00 ✓ or ✗ | |

Figure 1.6 Transactional App: Manage Production Orders App

- **Analytical apps**

These apps provide detailed information on large volumes of data for further analysis and are provided with drilldown capabilities for further monitoring at a finer detail level or at an organizational level. Analytical apps use SAP S/4HANA's analytical capabilities. These analytical apps are also used for monitoring key performance indicators (KPIs) for further insights into the business. [Figure 1.7](#) shows an example of an analytical app: Monitor Production Orders.

The screenshot shows the SAP Monitor Production Orders application interface. At the top, there are filter fields for Shipment Definition (MRP Standard), Order Status (All), Component Coverage (All), Material (T5402_FG001), Material Delay (All), and Delay In Process (All). Below the header is a toolbar with buttons for Hide Filter Bar, Restore, and Filters (2). A table titled 'Production Orders (3)' lists three production orders:

| Status | Material | Start | End | Open Quantity | Order Status | Material Delay (Working Days) | Missing Components | Component Coverage (Working Days) | Delay In Process (Working Days) |
|--------|--|------------|------------|---------------|--------------|-------------------------------|--------------------|-----------------------------------|---------------------------------|
| | T5402_FG001 Finished Material-T5402_FG001 | 06.09.2021 | 10.09.2021 | 500 PC | Created | 205 | 5 | 47 days late | 4 |
| | T5402_FG001 Finished Material-T5402_FG001 | 07.09.2021 | 11.09.2021 | 500 PC | Created | 205 | 5 | 48 days late | 4 |
| | T5402_FG001 Finished Material-T5402_FG001 | 14.09.2021 | 15.09.2021 | 10 PC | In Progress | 47 | 4 | 39 days late | 3 |

Figure 1.7 Analytical App: Monitor Production Orders

- **Fact sheets**

Specific object overview and navigation to related objects and, in some cases, KPIs, can be obtained with fact sheet apps. These apps use the enterprise search capabilities of SAP S/4HANA. You can also access standard SAP GUI transactions directly in the

SAP Fiori launchpad; they are called SAP S/4HANA classic applications. These apps are launched in the browser and have a SAP Fiori look and feel. To access one of these applications, you can directly type the SAP GUI transaction code in the search field in the SAP Fiori launchpad, for example, Transaction CO01 (Create Production Order), as shown in [Figure 1.8](#). In the browser you can see that the GUI reference will be there.

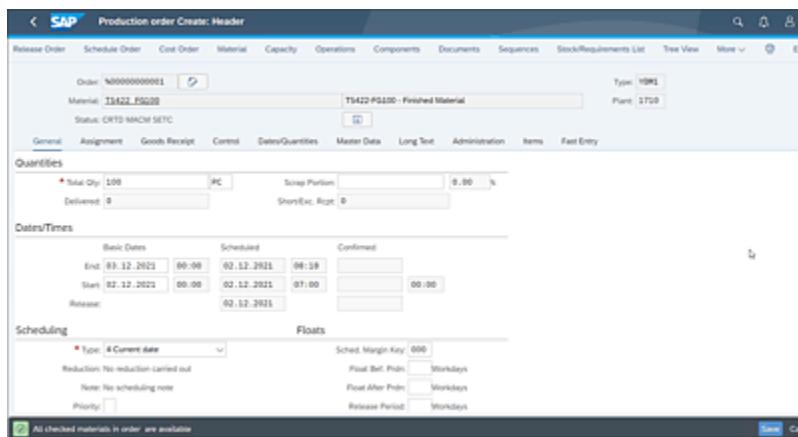


Figure 1.8 Access SAP GUI Transaction CO01 Directly in the SAP Fiori Launchpad

If you access standard SAP GUI transactions in the SAP Fiori launchpad, then the look and feel will change. These transactions will have text instead of icons in the toolbar. One striking change is that the processing icons, such as save, execute, and close, are available in the footer.

1.5 SAP Activate Framework

Using agile ways of working and delivering projects and initiatives by agile methodologies and frameworks is gaining traction across the world, and many organizations are moving toward and adopting agile frameworks. To support this shift, SAP has come up with the SAP Activate framework, which is a methodology to implement and deliver SAP S/4HANA products and innovations. SAP implementations are complex in general, but with the SAP Activate methodology, the focus is on iteratively implementing SAP and is, most importantly, business driven with frequent innovations. SAP Activate replaces the previously followed methodologies of ASAP 8.0 and SAP Launch. The SAP Activate framework comprises the following three main pillars:

- **SAP Best Practices**

SAP Best Practices contains standard ready-to-run preconfigured business processes for SAP S/4HANA that are based on experience gained from a large number of customer projects. SAP Best Practices also delivers not only the software but also the solution documentation with process flows, system setup, and test scripts. SAP Best Practices content is available for on-premise and cloud implementations. As shown in [Figure 1.9](#), you can find solution scope, accelerators, and other relevant information such as solutions, blogs, and so on in the SAP Best Practices Explorer at <https://rapid.sap.com/bp>. The advantages to using the proven SAP Best Practices content are the predictive results, faster time to value, and accelerated implementation.

- **Guided configuration**

SAP Best Practices can be activated with Solution Builder tool,

which is the first step in guided configuration. Country-specific SAP Best Practices can be activated from the best practice content loaded. The business processes are modeled as scope items. These scope items carry the building blocks that will be activated. The solutions must be activated in a sequence. If any scope items aren't needed, then deactivating them individually is recommended.

Transaction /n/SMB/BBI is used to access the Solution Builder tool, as shown in [Figure 1.10](#). The activation of best practices is a

system setup activity, which the system administration team will perform.

The figure consists of two screenshots of the SAP Best Practices Explorer interface. The top screenshot shows the main dashboard with various categories and counts: Complete Portfolio (31), SAP S/4HANA (12), With SAP Solution Manager 7.2 (4), What's New (2), and Cloud Release Assessment and Scope Dependency (Tools). Below this is a section titled 'MY AREAS' with 'SAP Solution Manager 7.2 Basket' (2) and 'Favorites' (1). The bottom screenshot shows a detailed view of the 'SAP Best Practices for SAP S/4HANA (on-premise)' package. It includes a description: 'Accelerate and simplify the path to SAP S/4HANA (on-premise) for faster time to value with SAP Best Practices that are tailored specifically to simplify the adoption of SAP S/4HANA.' It shows the version as 'Sweden, SAP S/4HANA 2020', language as 'English', and a direct link to the package. The 'Solution Scope' tab is selected, showing sections for 'Solution Information' and 'Software Requirements'. The 'SOLUTION SCOPE' section lists 'Scope Item Groups' with a single item named 'Finance' described as 'Achieve excellence in financial management & accounting with regulatory compliant financial insight at any time, from anywhere using best practices and machine learning'.

Figure 1.9 SAP Best Practices for SAP S/4HANA

The screenshot shows the SAP Solution Builder - Solution Editor interface. The left pane displays a tree view of solution components under 'Solution List', including '7_My_SOLUTION_US' and various sub-components like 'US_B03_OP', 'US_B04_OP', etc. The right pane shows a detailed view of a selected component, 'My US Solution', with a list of checked and unchecked items such as 'Sales Processing using Third-Party with Shipping Notification', 'Sell from Stock', 'Basic Credit Management', etc.

Figure 1.10 SAP Best Practices: Solution Builder

In general, the best practice content is activated on a sandbox system. Apart from the business-process-specific configurations, best practices content also supplies the process-specific master

data for conducting fit-to-standard workshops. The next step is to perform the out-of-the-box best practice demonstration and identify the gaps with reference to the delivered best practices. This approach drastically reduces the time taken to build and demonstrate the first end-to-end process to business users.

- **SAP Activate methodology**

The SAP Activate methodology is the next-generation project implementation methodology to deliver solutions and innovations. With this methodology, the approach is to iteratively implement and deliver solutions.

SAP Activate has six different phases, as shown in [Figure 1.11](#):

- **Discover phase**

Based on the business requirements and the digital transformation road map, organizations can engage with SAP directly or with partners to understand SAP product capabilities, business benefits, and value offerings. Customers can apply for a free trial license to gain hands-on experience, which is vital at this stage.

- **Prepare phase**

This is the formal start of all the preparatory activities both from the customer and partner side. The SAP system is provisioned with the budget, people, processes, schedule, and initiative-specific activities being planned. During this stage, the high-level customer business processes and requirements are already captured. They form the basis for the next important phase.

- **Explore phase**

Based on the out-of-the-box best practices content, the fit-to-standard analysis is performed during this phase. The customer-specific organization setup and customization values are also determined. The business processes, any needed extensions, gaps (including forms), and so on, are determined and added to

the project backlog. Preparation for data migration, training, and testing requirements are identified and planned.

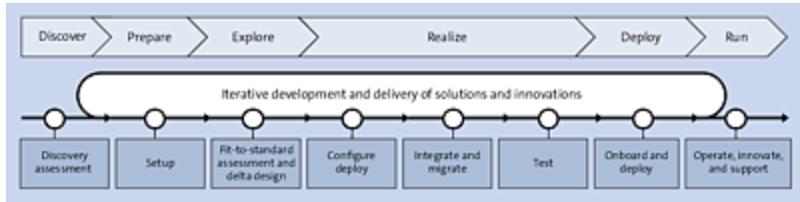


Figure 1.11 SAP Activate Methodology

- **Realize phase**

The actual system build, test, and validation of the solution in an iterative agile methodology are performed. The developed solution is demonstrated to the business stakeholders to give them a touch and feel of the developed solution. Any adjustments to be performed are discussed, developed, and adopted in iterations in each sprint. Data is loaded, and trainings are conducted. Various levels and iterations of testing are performed. The SAP implementation may impact parts or the organization or the entire organization. Organizational change management activities are to be aligned well in advance, so that smooth transition to the newly developed solution is adopted seamlessly. One important activity of organizational change management is also coordinating the activities for business roles and SAP user roles alignment.

- **Deploy phase**

All of the activities related to the go-live of the developed solution are deployed into the productive system. The technical activities, such as importing all of the SAP transports, are performed. Master data is loaded onto the system. The cutover and dark phase activities are rehearsed and acted upon. In general, there will be a mandatory stop of business activities for smooth switchover to the SAP productive system. During this phase, all the transaction data, such as inventory, open orders, and open items are also

migrated. Finally, the go-live happens. The hypercare commences, and the activities are handed over to the agile/scrum teams or support organization.

- **Run phase**

After the go-live and hypercare, the solution is stable and adopted well in the organization. In this phase, the implemented solution is monitored, and needed adjustments are performed for the solution. Additional activities are undertaken in this phase based on innovations and continual improvement.

1.6 Supply Chain Planning

MRP is the backbone of SAP ERP systems. On top of MRP, topics such as sales and operations planning (S&OP) and flexible planning tools gained prominence. After the initial success and wider adoption of SAP ERP and these planning tools, SAP introduced SAP Advanced Planning and Optimization to further develop the planning tools. Two of the main constraints of SAP Advanced Planning and Optimization were the system capabilities and the technology architecture. In SAP Advanced Planning and Optimization, modules such as S&OP, demand planning, supply network planning, PP-DS, and global availability to promise (GATP) were introduced. SAP Advanced Planning and Optimization is a separate system connected to SAP ERP systems via the CIF. The planning steps are performed in SAP Advanced Planning and Optimization, and, at the end of the planning cycles, the planning results are pushed to SAP ERP for further processing.

Then, as a result of further improvements and innovations, SAP launched SAP Integrated Business Planning for Supply Chain (SAP IBP) about eight years ago, when the cloud platform was picking up its pace and SAP Advanced Planning and Optimization was used as planning software, which had limitations and, for many customers, was still complex planning software to work with. The market was looking for a flexible and collaborative tool that could consider external factors while planning, provide faster response capabilities, and support decision-making by providing real-time information and transparency through an end-to-end supply chain.

The first release of SAP IBP comprised mainly S&OP features that were launched as a supplement offering to SAP Advanced Planning

and Optimization. Later, inventory optimization and demand sensing were added to the offering. Slowly, demand planning, SAP Supply Chain Control Tower, and SAP IBP for response and supply features were added, and, in 2019, DDR came to SAP IBP as well.

SAP continues to improve on the SAP IBP offering by releasing updates every three months, which include enhancements to existing features, new additions/updates per future road maps, updates to data technology, integration possibilities, and so on.

As announced by SAP, the support for SAP Advanced Planning and Optimization will stop in 2025, so many of the modules from SAP Advanced Planning and Optimization are now either moved to SAP IBP with better and enhanced functions or moved to SAP S/4HANA. [Figure 1.12](#) shows some of the key modules that have already moved to SAP IBP from SAP Advanced Planning and Optimization.

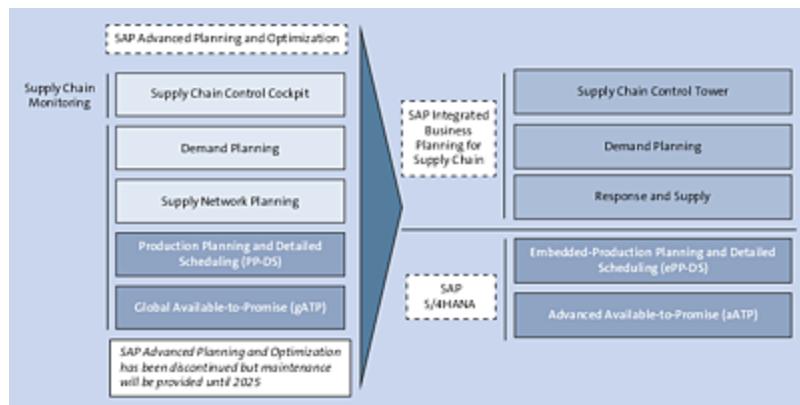


Figure 1.12 Transfer of Modules from SAP Advanced Planning and Optimization to SAP IBP

SAP IBP can be integrated with SAP S/4HANA using the SAP-provided cloud interface for time-series-based supply planning or using the smart data interface for order-based response planning. SAP IBP has the following two UIs:

- **Web interface**

This is mainly used for configurations, integrations, and job scheduling, although it also provides web-planning views, which help the planner or collaborators (vendors, customers) enter data on the go, that is, via mobile devices or tablets. The web interface provides many tiles, as shown in [Figure 1.13](#).

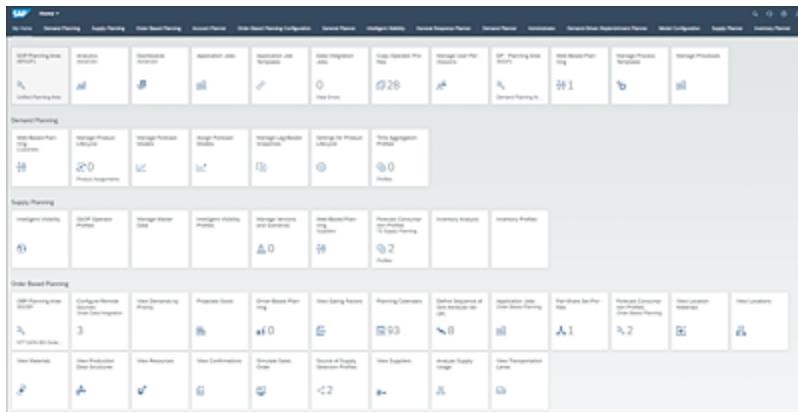


Figure 1.13 SAP IBP Web Interface

- **Microsoft Excel interface**

This is the frontend for planning, where planners spend most of their planning time. You can create and format your own planning view by selecting specific key figures, data sets, filters, and planning objects. With built-in VBA, you can quickly compare data in chart form. An additional SAP IBP tab appears in Microsoft Excel after the SAP IBP add-in for Microsoft Excel installation, which has many functions specific to SAP IBP, as shown in [Figure 1.14](#).

Figure 1.15 gives an overview of all the modules available so far in SAP IBP.

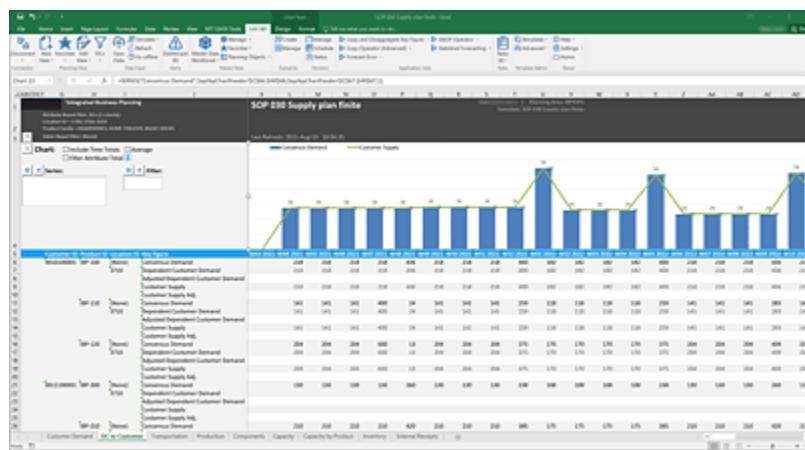


Figure 1.14 SAP IBP Planning View in Excel

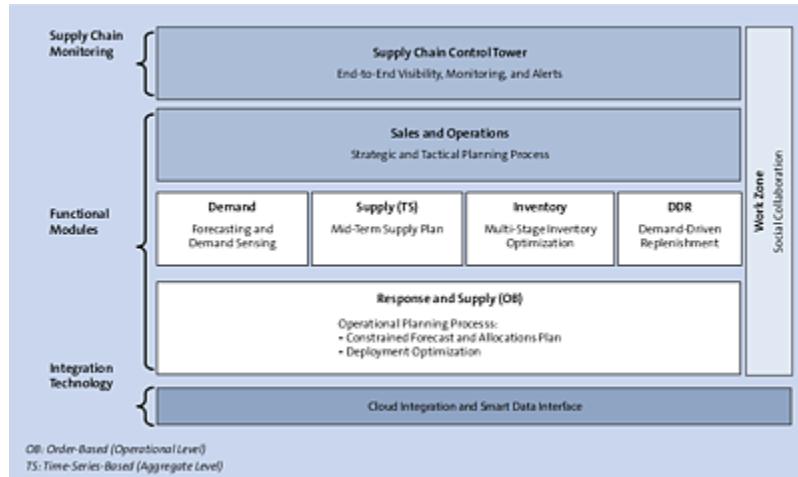


Figure 1.15 SAP IBP Landscape and Modules Offered

A classic business planning process follows these steps:

1. S&OP

A typical monthly S&OP process includes demand review, supply review, and reconciliation review. S&OP is executed for mid- to long-term horizons and provides a tactical and strategic plan. Depending on the industry scenario, it can also provide the

operation plan (when used with response planning). Typical S&OP starts with the demand planning process as below:

- **Demand planning**

Demand planning focuses on forecasting the future demand based on the historical data and various inputs of different demand planning stakeholders, such as sales planner, marketing manager, and so on.

Demand planning can be executed at the aggregated level (e.g., the product family and customer group) or at the detailed level (e.g., product location and customer). This demand plan is a key component of the mid- to long-term tactical and strategic plan, which helps the organization plan in advance and consider whether to increase in-house production capability or look for alternate sourcing and production possibilities (e.g., subcontracting), if the company isn't able to meet the predicted forecast.

- **Response and supply planning**

The next step in S&OP is supply review, in which the unconstrained forecast generated is balanced with the constraints in the supply chain. The constraints are then adjusted (if required), and a final supply plan is generated.

Supply planning considers the capacities throughout the supply network against the demand plan and generates a constrained plan considering all mapped constraints in the supply chain. This give a clear view of whether the demand can be met with the given supply chain capacities.

Supply planning can be established for the mid- to long-term time frame to derive a tactical and strategic plan, which helps in making expansion decisions in a long-term horizon. Supply planning can also be established in the short- to mid-term

horizon to look for probable issues and constraints in the supply chain in the near future and derive a target plan to help planners with make or buy decisions.

- **Reconciliation review**

The last step in S&OP is the reconciliation review: In many organizations, this is a monthly to quarterly process. When looking into mid- to long-term planning, the tactical and strategic decisions are made considering the issues in the supply chain and overcoming constraints. When looking into short-term planning, in monthly S&OP meetings, the critical decisions on what and how much to produce and the prioritization in production are investigated. The outcome of the reconciliation review is the final consensus demand plan (constraint forecast/production plan). This is then followed by short-term production planning in the plant done using PP-DS.

2. Production planning and detailed scheduling

PP-DS focuses on plant production and scheduling in the short-term horizon. It aims to optimize usage of production resources, and finitely schedule and sequence the orders in the production plant. Capacity leveling in PP-DS is executed for the generated planned orders either by MRP or from SAP IBP. Planned orders are sequenced or moved to alternate resources or lines to make sure a feasible production plan is generated without exceeding the production resource capacities. The PP-DS plan is then frozen, and orders are converted, released, and finally handed over to the production for execution.

More details are provided on PP-DS in SAP S/4HANA in [Chapter 9](#) in this book.

3. Inventory optimization

SAP IBP for inventory deals with positioning the stock to absorb

uncertainties in the supply chain, which may be due to forecast inaccuracies, demand variability, or supply uncertainties. Multi-echelon inventory optimization uses an algorithm to determine the stocking nodes and overall lowest stocking cost in the supply chain.

4. Demand-driven replenishment (DDR)

DDR is based on the DDMRP methodology developed by the Demand Driven Institute. SAP provides part of the methodology, which deals with planning in SAP IBP and replenishment to be executed in SAP S/4HANA. The other option is to run the complete functionality in SAP S/4HANA only. DDR is explained in more details in the latter part of [Chapter 9](#).

1.7 Important Terminology

In this chapter, the following terminology was used:

- **Intelligent enterprise**

The SAP intelligent suite is a combination of core solutions and industry clouds, intelligent suite, intelligent technologies, and SAP BTP.

- **Production planning and detailed scheduling**

PP-DS is a planning tool used in the short-term horizon that aims to optimize usage of production resources, as well as finitely schedule and sequence the orders in the production plant.

- **SAP Activate**

The SAP Activate methodology is the next-generation project implementation methodology to deliver solutions and innovations. It's adopted from Scrum for the implementation of sprint cycles for innovations and quick adoptions.

- **SAP Business Technology Platform (SAP BTP)**

SAP BTP is one of the foundations for the intelligent enterprise. It consists of a database component, analytics component, intelligent technologies component, and integration and application development component.

- **SAP Fiori**

SAP Fiori is the new UX design language. The objective is to have a simplified, intuitive, and easy-to-adopt UI for all business applications.

- **SAP Fiori application types**

Based on the technology usage, there are three types of

applications types: transactional apps, analytical apps, and fact sheet apps.

- **SAP Fiori launchpad**

The SAP Fiori launchpad is the starting point for users to access the tiled apps based on user roles and authorizations, which can be accessed via web browser. Users can customize the launchpad based on their preference by adding new apps, grouping apps, or changing the themes.

- **SAP HANA**

SAP HANA is an in-memory, column-oriented database on which SAP S/4HANA is built. It combines OLAP and OLTP operations into a single system.

- **SAP Integrated Business Planning for Supply Chain (SAP IBP)**

SAP IBP is the cloud-based planning tool for S&OP, demand management, inventory optimization, and other components for end-to-end visibility of the supply chain.

- **SAP S/4HANA**

SAP S/4HANA is the successor to SAP ERP and is the new strategic direction for SAP. This is built on SAP HANA to leverage the in-memory, column-oriented database by simplifying the code and data structures. SAP S/4HANA stands for SAP Business Suite 4 SAP HANA.

1.8 Practice Questions

These questions will help you evaluate your understanding of the topics covered in this chapter. They are similar in nature to those on the certification examination. Although none of these questions will be found in the exam itself, they will allow you to review your knowledge of the subject. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers and only correct answers to receive credit for the question.

1. True or False: The intelligent suite comprises SAP S/4HANA Enterprise Management and SAP S/4HANA LoB solutions.
 - A.** True
 - B.** False
2. SAP supports digital transformation of organizations and making enterprises intelligent. What are the components of an intelligent enterprise? (There are three correct answers.)
 - A.** Intelligent suite
 - B.** Intelligent technologies
 - C.** SAP Activate methodology
 - D.** SAP Business Technology Platform
 - E.** SAP Best Practices
3. Which of the following are design principles of SAP Fiori? (There are two correct answers.)
 - A.** Delightful
 - B.** Coherent
 - C.** Complex
 - D.** On-premise

4. Which of the following are types of SAP Fiori apps available only on SAP HANA? (There are two correct answers.)
- A.** Transactional apps
 - B.** Analytical apps
 - C.** Fact sheet apps
 - D.** Environmental apps
5. True or False: The SAP user experience (UX) strategy and road map for SAP S/4HANA is to slowly remove SAP GUI and completely replace it with SAP Fiori by 2025.
- A.** True
 - B.** False
6. In the SAP Fiori launchpad, how can the end user add or remove apps?
- A.** Select the **Edit Home Page** option in the user actions menu.
 - B.** Select the home page of the SAP Fiori launchpad.
 - C.** Right-click on the SAP Fiori launchpad and select the **Add/Remove Apps** option.
 - D.** Use the theme designer menu in the SAP Fiori launchpad.
7. Which of the following deployment option provides the latest innovations delivered quarterly?
- A.** SAP S/4HANA Cloud, essentials edition
 - B.** SAP S/4HANA Cloud, extended edition
 - C.** SAP S/4HANA AnyPremise edition
 - D.** SAP S/4HANA, hybrid edition
8. Which are the key features of SAP HANA? (There are three correct answers.)

- A.** Parallelization
 - B.** In-memory
 - C.** Compression
 - D.** SAP Fiori
9. Which of the following are pillars of the SAP Activate framework? (There are two correct answers.)
- A.** SAP Best Practices
 - B.** SAP industry cloud
 - C.** Expert configuration
 - D.** SAP Activate methodology
 - E.** SAP Launch methodology
10. In which SAP S/4HANA version was the production planning and detailed scheduling (PP-DS) component introduced?
- A.** 1511
 - B.** 1610
 - C.** 1709
 - D.** 1909

1.9 Practice Answers and Explanations

1. Correct answer: **A**

- SAP S/4HANA consists of SAP S/4HANA Enterprise Management, also known as simplified core, and SAP S/4HANA Line-of-Business (LoB) Solutions such as SAP IBP, SAP for Customer Experience, and so on.

2. Correct answers: **A, B, and D**

The intelligent enterprise is SAP's strategy to unlock the potential for business transformation with the intelligent suite. The key areas in an intelligent enterprise are the intelligent suite, intelligent technologies, industry cloud, and SAP BTP. But the SAP Activate methodology and SAP Best Practices are part of the SAP Activate framework, which is a methodology to implement and deliver SAP S/4HANA products and innovations.

3. Correct answers: **A and B**

The SAP Fiori design philosophy is that apps should be simple, role-based, coherent, adoptive, and delightful.

4. Correct answer: **C**

There are three types of SAP Fiori apps available: transactional apps, analytical apps, and fact sheet apps. Of these, analytical apps and fact sheet apps are based on the enterprise search and analytical capabilities of SAP HANA; therefore, the answer is B and C only. The transactional apps are available on any database.

5. Correct answer: **B**

SAP GUI will remain in SAP S/4HANA. On top of the existing SAP GUI, the SAP UX strategy is to develop more and more native SAP Fiori apps that follow the SAP Fiori design principles.

6. Correct answer: **A**

By going into the **Edit Home Page** option in the user actions menu in SAP Fiori launchpad, the user can customize the launchpad by adding, removing, and moving apps, or by renaming the groups as needed. However, if the user wants to add a new app, the user must have the appropriate authorizations beforehand and must have already been assigned with the right catalog.

7. Correct answer: **A**

SAP S/4HANA Cloud, essentials edition, provides the standard core processes and functionalities, the scope isn't as extensive as the on-premise edition. The innovations are delivered quarterly, and the hosting company is responsible for maintaining and updating the software and infrastructure.

8. Correct answers: **A, B, and C**

Compression of data is the key feature of SAP HANA. In-memory is the primary advantage of SAP HANA, where the data is stored in the primary memory (RAM). Data access from this memory is much faster than the traditional databases. Parallelization also enables faster data processing. SAP Fiori is a UI technology, not a key feature of SAP HANA.

9. Correct answers: **A and D**

The SAP Activate framework is a methodology to implement and deliver SAP S/4HANA products and innovations. The main

pillars are SAP Best Practices, guided configuration, and the SAP Activate methodology (also known as one methodology).

10. Correct answer: **D**

In SAP S/4HANA version 1909, embedded PP-DS is introduced in the SAP S/4HANA core. Master data harmonization and CIF simplifications were also part of this release. With MRP Live, PP-DS runs can be performed seamlessly.

1.10 Test Takeaway

In this chapter, we discussed the digital transformation, as well as the SAP intelligent suite and its various components. SAP HANA and SAP S/4HANA both are part of the SAP intelligent suite offering from SAP along with other technologies to support and accelerate digital transformation and intelligent enterprise initiatives. We also discussed the SAP UX and other details such as SAP Fiori design principles and managing the SAP Fiori launchpad. We discussed SAP Activate, agile ways of working, and various tools available to support SAP initiatives. It's always good to have an understanding of the evolution of production planning in SAP S/4HANA. We summed up the chapter with supply chain planning and its background, as well as the various tools and other offerings from SAP IBP.

1.11 Summary

You've gained a good high-level understanding of SAP HANA, SAP S/4HANA, SAP Fiori, and intelligent enterprise offerings from SAP. Now you can explain various deployment options available so that business teams can make an informed decision. Understanding the background of supply chain planning and the available LoB solutions is important. This high-level information is the foundation for going into further details on specific topics in this book. In the next chapter, we'll discuss various master data objects relevant for production planning and manufacturing.

2 Master Data for Production

Techniques You'll Master

- Organizational elements in SAP S/4HANA
- Purpose and usage of master data relevant for production planning
- Importance and usefulness of different material types
- Features and types of bills of materials (BOMs)
- Features of production process management with task lists
- Production version and various dependencies between master data objects
- Relevant engineering change management (ECM) topics

In this chapter, we introduce the organizational elements and master data relevant for production planning and analyze how the master data is integrated into the overall manufacturing processes. When required, we'll also cover the important field-level information that will impact the process flow, potential pitfalls, and tips and tricks to manage the overall master data objects.

The master data is most important for any process and is the lifeline of organizations. Master data objects are interlinked and dependent on each other for execution of production planning business processes:

- *Material master*: Material masters are the first object to be created, as they must exist before the BOMs are created.

- *BOM*: BOMs are lists of components that comprise a product. The BOM components can be assigned to routing operations
- *Routing/rate routing/task list*: Routings are lists of operations required to produce a product.
- *Work center*: Work centers are the place where the operations are performed to produce a product, which is assigned to a routing.
- *Production version*: The BOM and routing/rate routing are combined to determine how a material is produced.

Real-World Scenario

As a consultant for production planning, you'll be collecting customer requirements and configuring the SAP S/4HANA system to suit the business requirements and manage the business processes. Master data forms the base and lifeline for any organization. Understanding the customer's organization, master data, and business processes holistically and then applying the knowledge in the digital transformation initiatives are the primary responsibilities of a consultant. All the variants and options available in the master data objects are seldom used fully in a single project/initiative, but, as consultant, you must have an overall understanding of the standard out-of-the-box SAP S/4HANA capabilities, and you must think through how best you can suggest, implement, and support the initiatives and application maintenance activities.

2.1 Objectives of This Portion of the Test

The purpose of this portion of the certification exam is to test your knowledge of master data objects related to production planning. For

the certification, you must have a good understanding of the following topics:

- Organization elements, salient features, and assignments
- Dependencies of master data on organization elements
- Dependencies of production planning master data with other SAP modules
- Structure of the material master
- Bill of material (BOM) data, item categories, various technical types, and the usage of engineering change management (ECM)
- Work center usefulness and the close link with task lists
- Dependencies among organizational elements, master data, and business processes

[»] Note

The master data for production in SAP S/4HANA topic makes up > 12% of the total exam.

2.2 Organizational Structure

In an SAP S/4HANA implementation, the initiative is to understand the customer's organization, business processes, and master data needs to manage executing the processes in SAP S/4HANA. The construction of the enterprise structure is performed by way of customization. The next step is to customize the master data and business processes. Business processes are executed based on the master data, and transaction data will be created.

Building the enterprise structure is the first step in the realize phase of the initiative. This important activity maps and assigns the business organizational units into the SAP S/4HANA system. The master data is created along the lines of the organizational structure. In the following list, we'll outline the organization elements that are important for production planning:

- **Client**

The client is hierarchically the highest organizational unit in the SAP system. This is an equivalent of a company or a corporate group or group of subsidiaries. In the SAP system, a client contains its own enterprise structure, master data, transactional data, and set of tables. Data entered at the client level is available across the organization, reducing the redundancy of the data. A client is uniquely defined in the system by a three-character numeric key.

- **Company code**

A company code represents a legal unit within the corporate group or client for which a complete chart of accounts can be created so that its own financial statements can be created. It's possible to set many company codes in one client. A company code is defined

in the system using a four-character alphanumeric key that is unique to the client.

- **Plant**

The plant is the most important and fundamental organizational unit for production planning and logistics. A plant can be a manufacturing plant, a unit that will provide goods or services, or both. A plant can be assigned to one company code. The material produced in a plant can be sold through several sales organizations and distribution channels. A plant also contains several shipping points. Several purchasing organizations source material for a plant, so a plant can be assigned to several purchasing organizations. Plant-specific master data can be created, and production planning transactions can be posted at the plant level. It's also possible to perform some execution steps across plants.

- **Storage location**

Hierarchically, a storage location is assigned to a plant and always belongs to one plant only. Storage locations are used to manage the material stocks/inventory on a quantity basis. Inventory is always assigned to a storage location in the system. If you don't use warehouse management, then the storage location is the smallest organizational unit on which you can manage your stock quantities, so you carry out your physical inventory at the storage location level.

- **MRP area**

The organizational unit relevant for material requirements planning (MRP) in SAP S/4HANA is the MRP area. The MRP area corresponds to a plant, part of a plant, or a subcontractor.

Apart from these objects, there are other objects that are also used in production planning, such as production resources tools (PRTs),

which are directly used in the production but aren't directly consumed in the production process. Documents can be created in the SAP Document Management service and can be assigned in a BOM or routing.

For the end-to-end processes in SAP S/4HANA to be executed, the relevant SAP modules are dependent on each other for smooth transactional flow.

2.3 Material Master

For any organization, especially for production planning and logistics, the material master is one of the most important master data objects, as it contains information concerning what an organization purchases, manufactures, stores, and sells. Apart from these transactions, there are various other business transactions that can be performed by using material masters.

The material master is the central data source, and all the relevant departments in the organization will take responsibility to maintain it in different views that are relevant to individual user departments.

The material master is always linked with an industry sector and material type. While creating a material, these two aspects must be selected first. In the next sections, we'll cover material numbering, material types, and various ways of creating, viewing, and managing material masters. You can expect questions specifically in these areas.

[»] Note

While creating a material, the industry sector is assigned in the creation of material master selection screen. The industry sector (e.g., chemical, mechanical, retail, etc.) determines the field selection and screen sequence of a material master. The assignment of an industry sector to a material master is irreversible; you can't change it once assigned.

From the material master create/change/display transactions, by accessing the **Defaults** menu, it's possible to set the **Industry**

Sector as default. It's also possible to set **Views** and **Organization Levels** as defaults.

2.3.1 Material Numbering

The material number is unique for each material, and you can assign the numbering externally or internally. The type of material numbering is defined in the customization at a material type level.

For external numbering, the number must be set up front at the time of material creation in the selection screen of the material master.

For internally managed numbering, at the time of saving the material master, the system will automatically assign the next available number based on the number range.

Up until SAP Business Suite (SAP ERP), the length of the material master was 18 characters. With SAP S/4HANA, the length increased from 18 characters to 40 characters; however, for internal number ranges, it's still 18 characters. As shown in [Figure 2.1](#), the out-of-the-box setting is maintained at 18 characters. As such, the SAP S/4HANA system can handle the 40-character material master length (table field `MATNR`). If the 18-digit material length isn't sufficient to meet your business requirements, external alphanumeric numbering up to 40 characters can be used. For long material master numbering, two customization settings need to be made.

First, the new customization Transaction FLETS is used to activate and acknowledge the extended material number. After the material number is extended, it's irreversible. Care should be taken in choosing the extension of the material number, as the peripheral systems connected to the SAP S/4HANA system will also have to adjust the material number field. SAP expects you to acknowledge the change, and SAP Note 2232396 is mentioned in this

customization transaction, which explains the restrictions on the material master length extension. Second, as shown in [Figure 2.1](#), in customization Transaction OMSL, the required material number length is maintained.

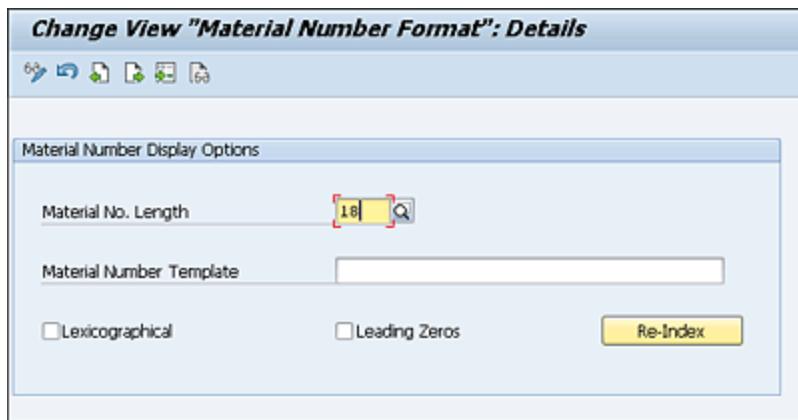


Figure 2.1 Material Number Format

A template can also be assigned to material numbers. For example, if you want to have the material in the format 12-3456-78, the system can appropriately insert the additional characters. In this example, the total length of the material master number is 10 characters—8 numeric and 2 additional characters.

The display format of the material number is client independent and applies to all clients.

2.3.2 Material Type

For the production planning and MRP perspective, important material types are finished products (FERT), semifinished products (HALB) , and raw materials (ROH) . Materials with similar characteristics are combined with the material type.

The material type determines the screen sequence, material number assignment (internal or external), quantity change updates and

financial value updates, and procurement type (in-house production, external procurement, or both). The attributes for material types customization are shown in [Figure 2.2](#) (Transaction OMS2).

Apart from the material types mentioned previously, the SAP system also supplies various standard material types. You can also create new material types based on the business requirement.

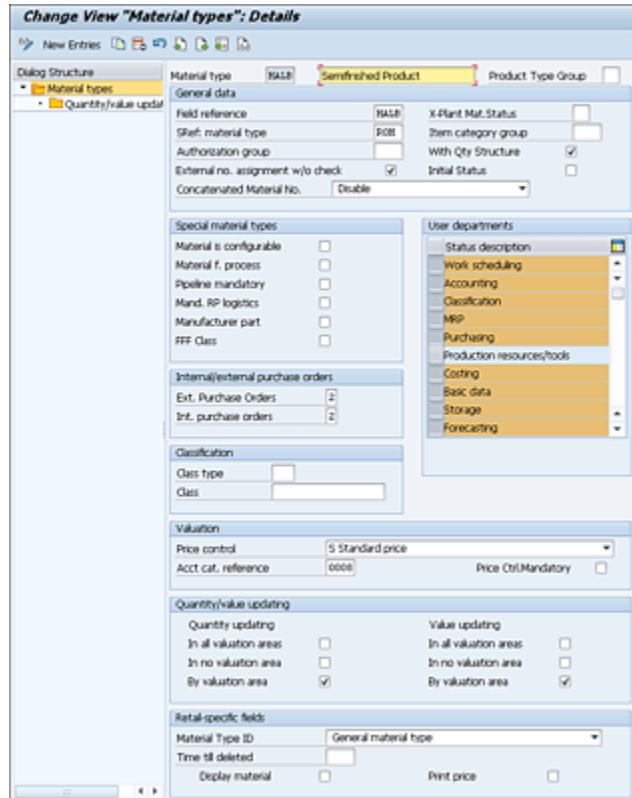


Figure 2.2 Attributes for Material Types

2.3.3 Creating the Material Master

As discussed earlier, maintenance of the material master is a collective responsibility among various departments in an organization. The material master has a hierarchical structure. For production planning, some of the material master views are

managed at the client level, at the plant level, and at the storage location level:

- **Client level: Basic Data 1 and 2, Classification**

The data maintained in these material master views is valid for all the organization levels. Material number, description, base unit of measure (UoM), weight, volume and so on are maintained in the **Basic Data** views. User-defined class information is maintained in the **Classification** view. These details and information are common for all organization levels. The same material may be used in various plants, but the basic facts about the material will remain same.

- **Plant level: MRP 1, 2, 3, 4; Forecasting, Work Scheduling, Advanced Planning**

Planning and production may need different parameters and settings for smooth handling of the operations in different plants. There may be similarities between the manufacturing plants, but they aren't necessarily the same, so these material master views will be managed at the plant level.

- **Storage location level: General Plant Data/Storage 1 and 2**

The data maintained in these views is specific to a storage location.

The material master can be created with Transaction MM01 or by accessing the SAP Easy Access menu: **SAP Menu • Logistics • Production • Material Master • Material • Create (General) • MM01 – Immediately**. As shown in [Figure 2.3](#), after the initial screen, you can see the **Select View(s)** dialog box ① where apart from the **Basic data** views, other views also can be selected and maintained at the same time. In the **Organizational Levels** ② dialog box, you

can select the appropriate organizational levels. The **Basic data** view ③ provides a simple overview of the data.

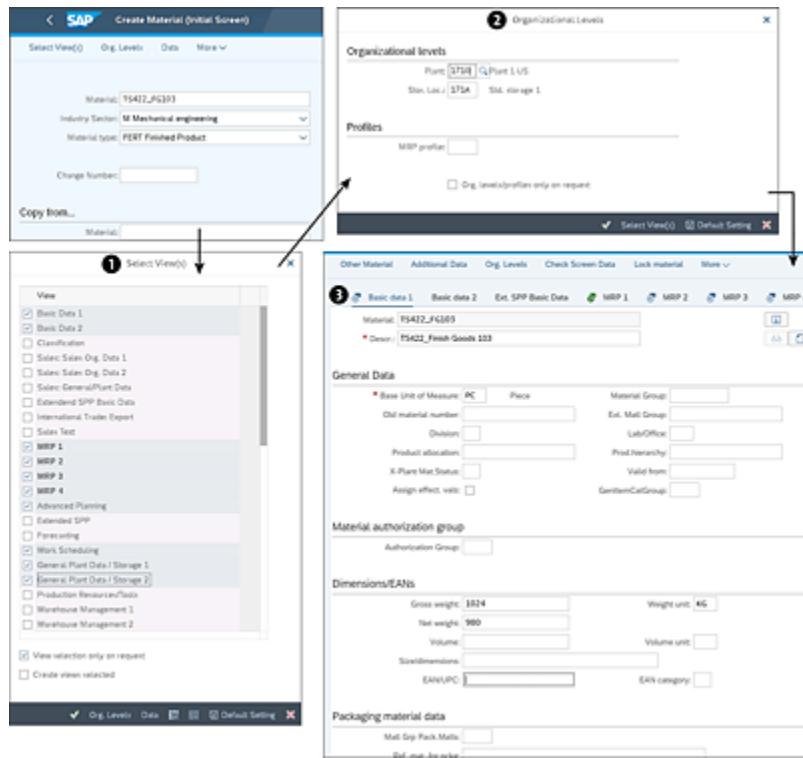


Figure 2.3 Create Material Master

[»] Note

In this chapter, we'll focus mainly on the client-level material views, that is, **Basic Data**, **Additional Data**, and **Classification**. Based on the relevancy, the production planning views are covered appropriately in the topic-specific chapters.

Following are various methods to create a material master (SAP Easy Access menu path is shown in [Figure 2.4](#)):

- Navigate to **Material Master • Material • Create (General) • MM01 – Immediately** if you want to create the material master to be available immediately for further processing.

- Navigate to **Material Master • Material • Create (General) • MM11 – Schedule** if you want to schedule the material master creation for a specific date in the future (must be in the future). After the material is created, on the given date, the material will be active. This provides you with the flexibility to adjust the material master field-level values before it's fully active.
- Navigate to **Material Master • Material • Create (Special)**, and choose the specific transaction codes based on the material type, as shown in [Figure 2.4](#). These special material master transactions make sense for those who create different types of material masters regularly. With these special transactions, **Material Type** is preselected in the material master creation selection screen.

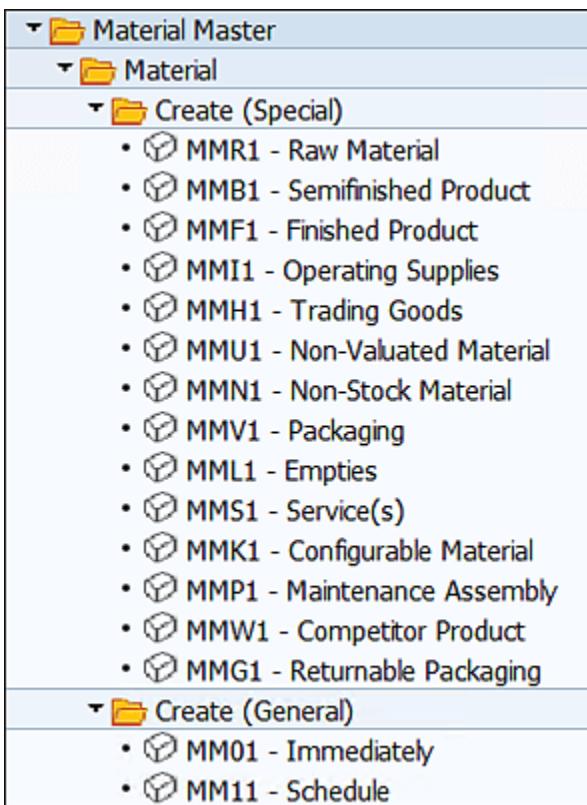


Figure 2.4 Transaction Codes to Create the Material Master

- Use the Create Material SAP Fiori app to create the material master, as shown in [Figure 2.5](#). This app is the SAP GUI transaction that can be accessed from SAP Fiori. This is another way of accessing the same Transaction MM01. It's a good approach to adopt SAP Fiori across the organization.

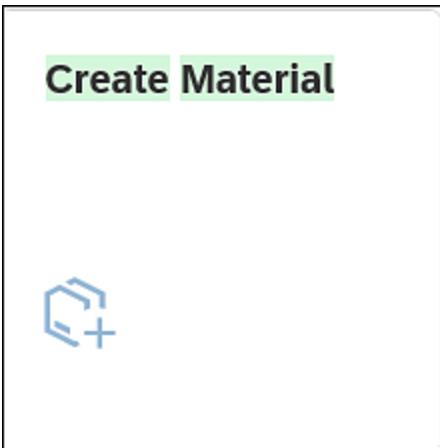


Figure 2.5 Create Material App

- Create the material master with reference to an already existing material. In Transaction MM01 (Create Material), you can reference an existing material, and appropriate organization levels and field-level data can be created with reference to the existing material. Change the field-level values wherever needed.

As shown in [Figure 2.6](#), if you select the **Create views selected** checkbox, the system will create all the views selected. With this indicator selected, it's not required to access and confirm each view selected individually. The system won't create the **Classification View, Sales Text View, Purchase Order Text View**, and all the additional data contained in the screens such as

basic data text, document assignment, production version, and so on.

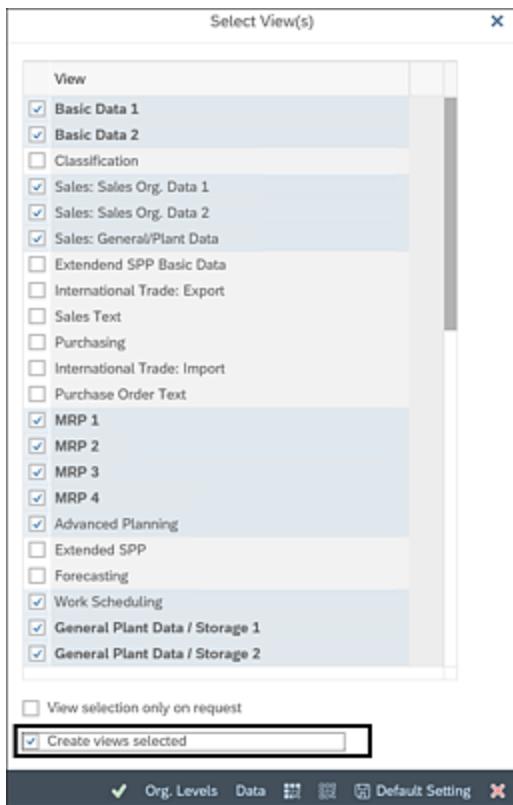


Figure 2.6 Material Master: Create Views Selected Checkbox

- Use Transaction MMCC (Copy Material). With this transaction, you can create, enhance, and change multiple material masters in one step based on an existing material master record.

As shown in [Figure 2.7](#), you can copy plant data, storage location data, sales and distribution data, warehouse number data, storage type data, and valuation data. Even though the basic data is at a client level, it's also mentioned in Transaction MMCC. The

classification data, MRP area data, production version data can't be copied because this data is dependent on other data objects.

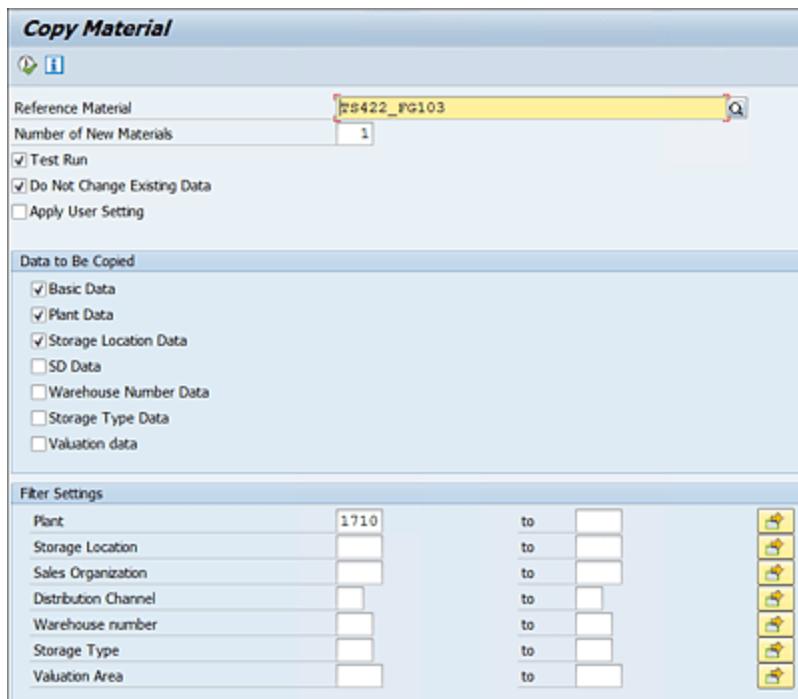


Figure 2.7 Transaction MMCC: Copy Material

After the material is created for a plant, this information is recorded in SAP S/4HANA. Additional material master views can be created via the following methods:

- **Transaction MM01**

You can extend the material master views that aren't yet created for the plant. This method is practical if a department created one or more views of the material master already, and the other departments want to create their own department-specific material master views.

- **Transaction MM50**

You can extend material views for many materials. This transaction is particularly useful if more than one material will be extended with specific views.

2.3.4 Additional Data in the Material Master

Apart from the material master views based on each business function or department, there is a provision to add additional data for material masters. The data screen can be accessed from any screen of the material master in which information such as material description, UoM, document data, and consumption information can be maintained or accessed, as shown in [Figure 2.8](#).

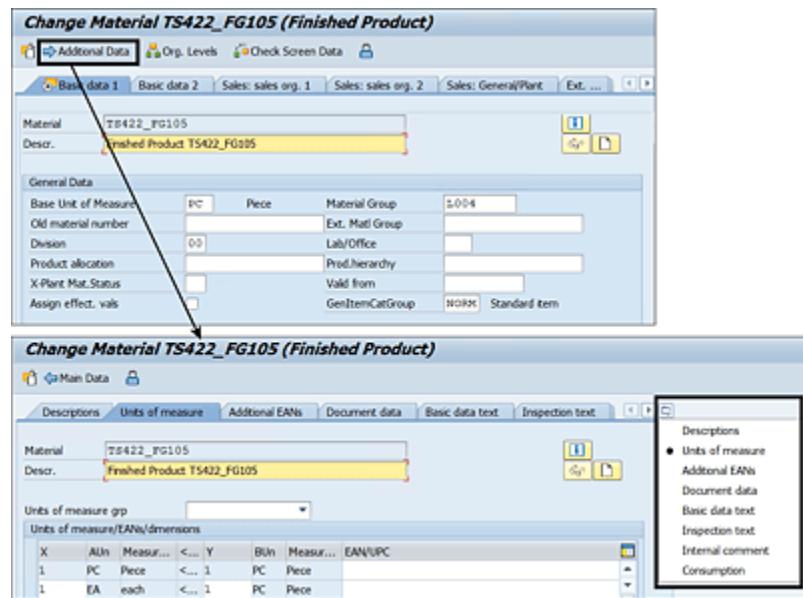


Figure 2.8 Material Master: Additional Data

The following list describes the additional data available for the material master:

- **Unit of measure**

Base Unit of Measure is one of the mandatory fields to be maintained in the material master **Basic Data** view. Base UoM is the one the system considers for inventory stock keeping and converts all the other UoMs maintained for the material into the base UoM. Apart from the base UoM, different UoMs are needed to be managed and owned by business departments, such as sales UoM, order UoM, unit of issue (UoI), warehouse

management UoM, and all these UoMs are referred to as alternate UoMs. These additional UoMs are maintained in respective tab pages of the material master.

There are two ways to maintain alternate UoMs:

- Choose **Additional data • Units of Measure**, as shown in [Figure 2.8](#), to maintain all the alternate UoM and conversion factors.
- Assign a UoM group. All the relevant alternate UoMs and conversion factors with base UoM can be combined into the UoM group. Using the UoM group reduces the effort in maintaining alternate UoMs individually.

The customization path and an example are shown in [Figure 2.9](#).

Careful selection of the appropriate base UoM is necessary. Later, if you want to change the base UoM, it's possible, but a lot of dependencies and dependent objects must be taken care of:

- Make sure that no inventory is available for this material.
- Ensure that there are no open orders for this material (production, purchase requisitions, purchase orders, scheduling agreements).

- While changing the base UoM, if any dependent objects are still there, the system will give you a warning/error message. Based on that message, you can address the issues.

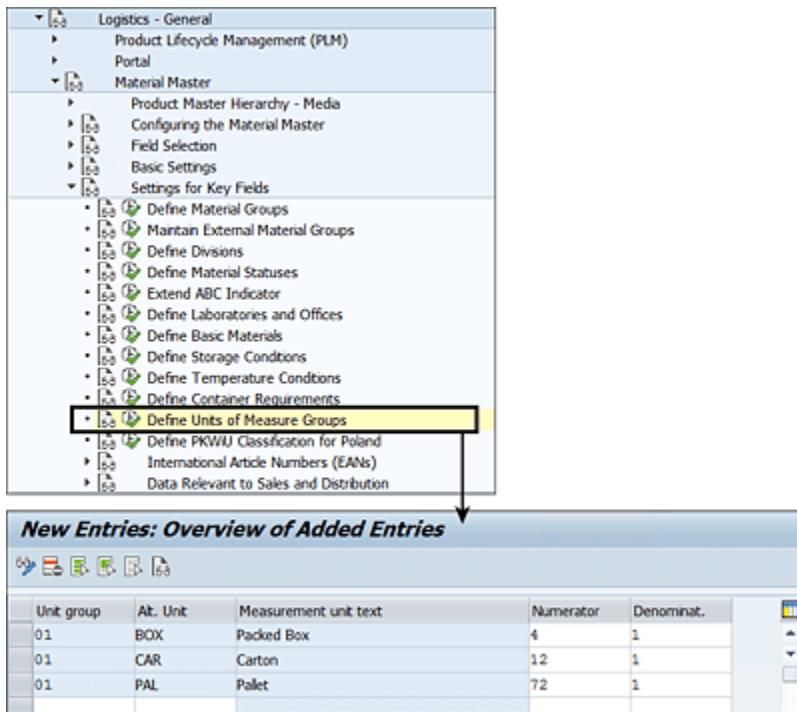


Figure 2.9 Material Master: Units of Measure Groups

- Assigning documents to the material master**

Original documents of any format can be linked to a material master with DMS. The first step is creating a document information record and assigning the original document there. In the material master's **Additional Data** area, the document information record can be added in the **Document data** tab.

Various documents related to the materials can be added in the material master, but only the document type **Design Drawing** is preset in the system. If a document of this document type is assigned to the material master, then in the **Design documents assigned** area in the **Basic data 2** view of the material master, the document reference is available, as shown in [Figure 2.10](#).

Other document types, if assigned, also won't be shown in this area.

As shown in [Figure 2.10](#), the initial state of the **Design document assigned** area in the **Basic data 2** view is the selected **No link** ① checkmark. Then, click **Additional Data** ② and assign the document information record in the **Document data** ③ tab, which will be reflected in the **Basic data 2** view ④.

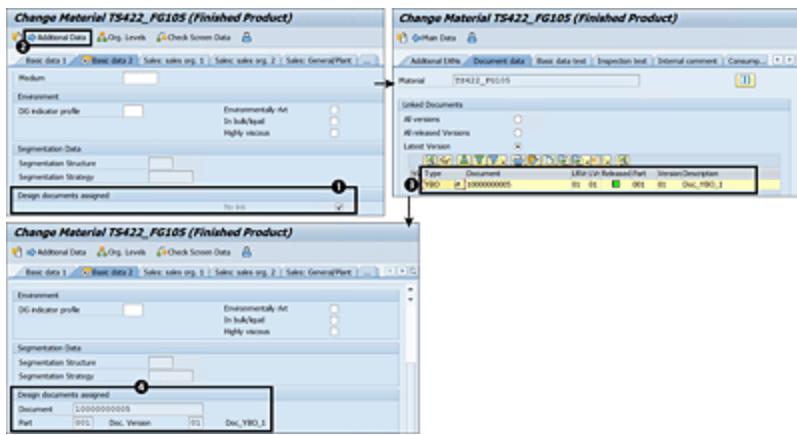


Figure 2.10 Material Master: Document Data

[»] Note

The document data is managed at the client level.

2.3.5 Classification View of the Material Master

Material classification can be used to describe materials more specifically by adding additional details. You can add more fields to capture these details in the **Classification** view; otherwise, it will be difficult or requires a change in the standard SAP system by adding more fields. Classification can be used to group the objects. The characteristics hold various properties or specifications that you want

to maintain for a material. These defined characteristics are assigned to a class, which can belong to a class type that holds the similar classes together. Using the classification to find the objects—for example, a material master based on the characteristics—is easy. The classes hold the characteristics and the values in them as search criteria.

The steps to maintain the classes follow:

1. Define the characteristics.

Various characteristics of a material such as length, width, color, viscosity, density, and so on can be captured by creating the needed characteristics with Transaction CT04, as shown in [Figure 2.11](#). You can add the characteristic values in the value assignment area.

The screenshot shows the SAP Change Characteristic dialog box. At the top, there are fields for 'Characteristic' (ZCOLOUR), 'Change Number', and 'Valid From' (11.08.2021). Below this, the 'Basic data' tab is selected, displaying fields for 'Description' (ZCOLOUR), 'Char. Group', 'Status' (1 Released), and 'Auth. Group'. In the 'Format' section, 'Data Type' is set to 'CHAR Character Format' with a length of 30, and 'Case Sensitive' is unchecked. Under 'Value Assignment', 'Single Value' is selected. The 'Template' field is empty.

Figure 2.11 Characteristic Maintenance

2. Define the classes.

Classes represent a group of characteristics that can be defined

based on materials. Classes can be created with Transaction CL02 based on the class type, and the characteristics can also be assigned during class creation, as shown in [Figure 2.12](#).

3. Assign the classification to the material master.

You can assign the defined classes to the material master, as shown in [Figure 2.13](#).

The screenshot shows the SAP 'Create Class' interface. At the top, it displays 'Class: Z_MAT_PROPERTIES', 'Class type: 001 Material Class', and a date 'Valid from: 11.08.2021'. Below this, there are tabs for 'Basic data', 'Keywords', 'Char.', 'Texts', 'Document', and 'Std'. The 'Char.' tab is selected, showing a table of characteristics:

| Char. | Description | Data ... | Nu... | De... | Unit | Re... | Org. Areas |
|----------|-------------|----------|-------|-------|------|-------------------------------------|------------|
| ZCOLOUR | ZCOLOUR | CHAR | 30 | 0 | | <input type="checkbox"/> | |
| ZDENSITY | Density | NUM | 4 | 3 | | <input checked="" type="checkbox"/> | |
| ZLENGTH | Lenth | CHAR | 4 | 0 | | <input checked="" type="checkbox"/> | |
| | | | | | | | |
| | | | | | | | |

Figure 2.12 Class Maintenance

The screenshot shows the SAP 'Classification' interface. It displays an 'Object' section with 'Material: TS422_FG103' and 'Class Type: 001 Material Class'. Below this is an 'Assignments' section, which lists the assigned class:

| Class | Description | Sta... | S... | Icon | Itm | |
|------------------|---------------------|--------------------------|------|-------------------------------------|-----|--|
| Z_MAT_PROPERTIES | Material Properties | <input type="checkbox"/> | 1 | <input checked="" type="checkbox"/> | 10 | |
| | | | | | | |

Figure 2.13 Class Assignment to the Material Master

[»] Note

Classification is an integral part of variant configuration. You can use configurable materials (material type KMAT) for this purpose.

2.3.6 Managing the Material Master

For daily management and maintenance of material masters, each organization will have its own strategy, whether a team of people manages all the material master views or each business department manages its department-specific views. Following are some of the ways to manage materials, as shown in [Figure 2.14](#):

- You can change the material master by using Transaction MM02 – Immediately.
- If you want to change some of the field-level values of the material master, changes can be scheduled with Transaction MM12 (Schedule).
- The scheduled changes for the material masters must be activated explicitly; otherwise, the changes won't be applied. This can be achieved with Transaction MM13 (Activate). Alternatively,

you can schedule a background job for program MMCHACTV on a daily basis, so that the changes will be activated.

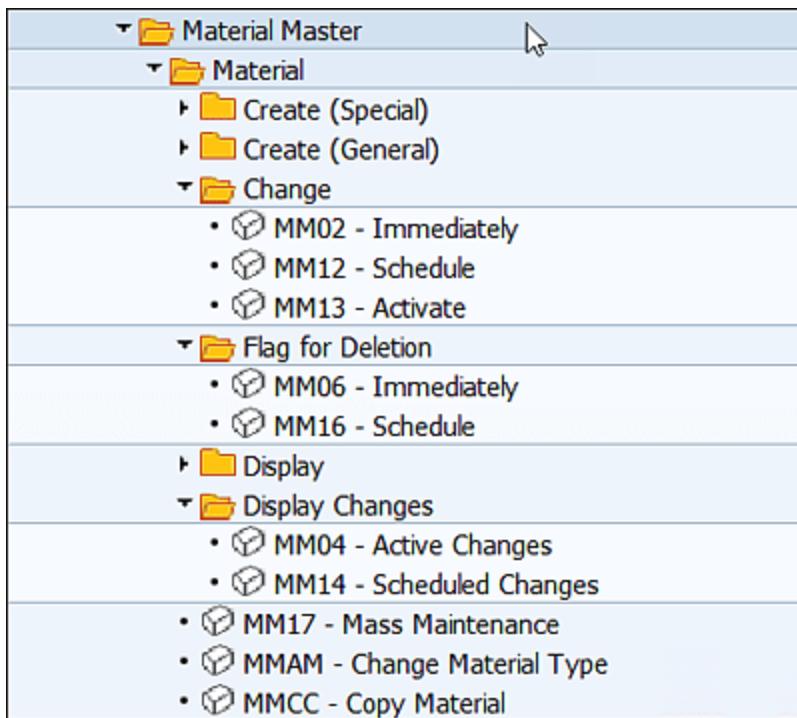


Figure 2.14 Managing Material Masters

[+] Tip

Create a variant for program MMCHACTV with both the date fields blank, and schedule the job. With this, the changes are activated only for the day when the program is executed.

- Mass change of material can be performed with Transaction MM17 (Mass Maintenance). This is a very useful transaction and reduces the manual effort when there is a need to perform mass changes to materials. With this, a lot of table data can be displayed and changed simultaneously. So, it's a matter of internal

organizational policy and user roles that determine who can change the data with Transaction MM17.

[!] Warning

Transaction MM17 can impact many objects simultaneously, so users with relevant training and experience should use this transaction code.

- Due to business process changes or any other reason, if the decision is to change the material type, it can be performed with Transaction MMAM (Change Material Type). If there are no transactions posted for the material and no orders or reservations created, then the material type can be changed without any restrictions. If stock and orders exist for the material, it's still possible to change the material type, but there are lot of dependencies, and the system will provide the details and errors while performing the change.
- Over a period of time during the lifecycle of a material, it may be required to clean up the old material masters from the system by archiving and deletion program. For this, the first step is to set the deletion flag. The deletion flag can be set at different organizational levels, that is, at the plant level or at the client level. Then, during the archival and deletion program, material will be deleted for this organizational level and below.
 - Transaction MM06 (Flag for Deletion – Immediately)
 - Transaction MM16 (Flag for Deletion – Schedule)

A proposal list can be fetched from the initial screen of Transactions MM06 and MM16, and an appropriate material can be selected, or a material master can be used directly for setting

the deletion flag, as shown in [Figure 2.15](#). After the deletion flag is set, you can still cancel the deletion flag.

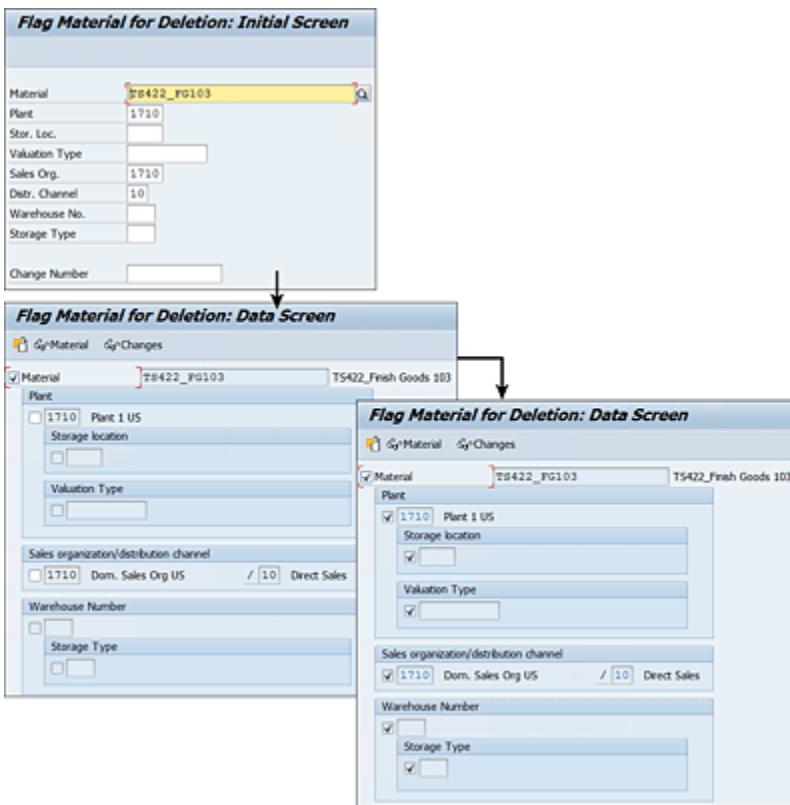


Figure 2.15 Setting the Material Master for Deletion

[»] Note

If a material has the deletion flag set at the client level, then the material will also be deleted for all the organizational levels below, that is, at the plant level, sales organization level, and so on.

- One of the most versatile features available to manage a material is the material status. The material status can be set as **Cross plant material status** in the **Basic data 1** view or **Plant specific material status** in the **MRP 1** view. You can set specific statuses based on the requirements or the

lifecycle of the material. You also can customize different statuses with Transaction OMS4, as shown in [Figure 2.16](#).

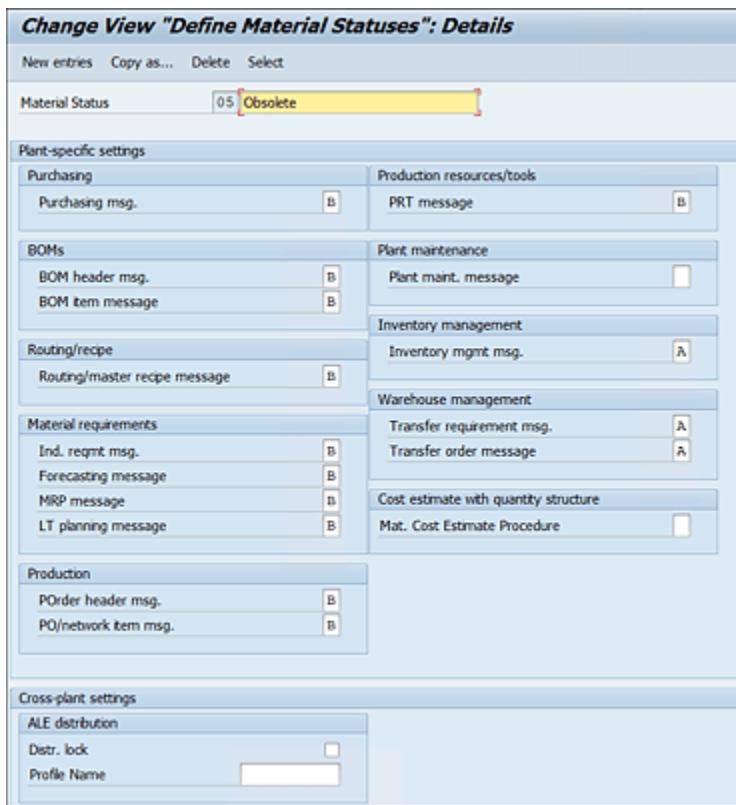


Figure 2.16 Material Statuses

In this case, the status mentioned is **Obsolete**, and, based on the settings for a material with this status, the system will give an error message if the material is used in purchasing functions, BOMs, MRP, or production activities. You can still perform inventory and warehouse movements, and the system will issue a warning message.

2.4 Bill of Materials

BOMs, parts lists, or product structures comprise a list of all the components (parts, subassemblies, assemblies), the quantities required, and the relevant UoMs) needed to produce the final assembly. It's also called a list of ingredients or recipe. This section provides an overview of the BOM as well as header details, item details, and other important BOM topics, including technical types, variant BOMs, low-level codes, and phantom assemblies.

2.4.1 Overview

An example of how the BOM works is shown in [Figure 2.17](#), which contains all the components needed to produce a ballpoint pen.



| Item No. | Component | Component Description | Quantity | Unit of Measure |
|----------|-----------|---------------------------|----------|-----------------|
| 0010 | BAREL01 | Barrel | 1 | PC |
| 0020 | GRIP01 | Grip | 1 | PC |
| 0030 | TIP03 | Tip | 1 | PC |
| 0040 | SPRNG01 | Spring | 1 | PC |
| 0050 | CAP04 | End cap | 1 | PC |
| 0060 | CLIP03 | Clip | 1 | PC |
| 0070 | RBI001 | Roller ball ink cartridge | 1 | PC |

Figure 2.17 BOM of a Ballpoint Pen

A BOM is an important master data object for MRP, work scheduling, and product costing, to name a few. Various kinds of BOMs can also be created in SAP S/4HANA, including a material BOM, sales order BOM, work breakdown structure (WBS) BOM, equipment BOM, and document BOM. These objects are related to different functional SAP modules but are combined in one place because the intention is to create a BOM for the component parts, as shown in [Figure 2.18](#),

from SAP Menu • Logistics • Production • Master Data • Bills of Material • Bill of Material.

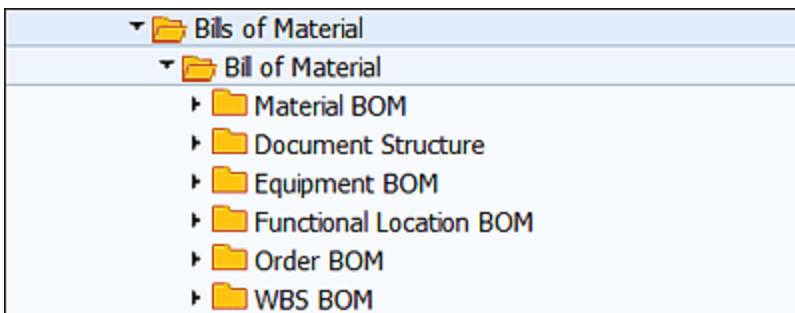


Figure 2.18 BOM Categories

In SAP systems, the BOM is always a single level item. In other words, when a subassembly is part of a final assembly, the system will automatically connect the subassembly BOM with the final assembly BOM. When you explode the BOM, the system shows you the multilevel structure and logical relationship. A multilevel BOM is shown in [Figure 2.19](#).

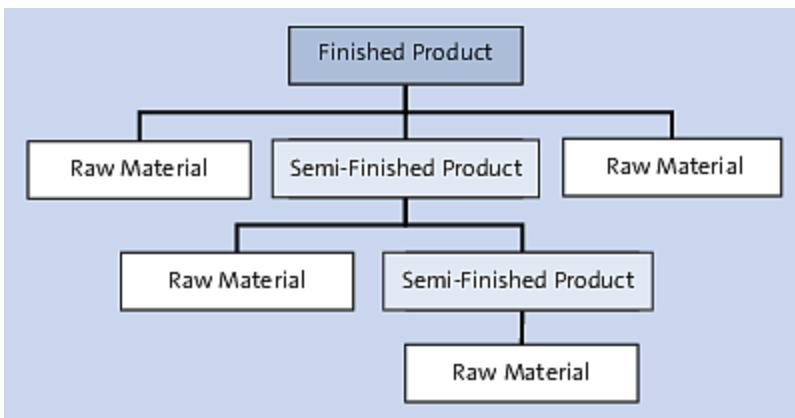


Figure 2.19 Multilevel BOM

A BOM can be created with Transaction CS01 (see [Figure 2.20](#)), changed with Transaction CS02, and displayed with Transaction CS03. While creating the BOM, the material for the component list we're going to create forms the header of the BOM. Components, item categories, quantities, and UoMs are added to form the BOM. A

BOM will also have a status that controls whether the BOM is under construction or available for subsequent processing. The BOM usage determines for what purpose the BOM is created.

The screenshot shows the SAP Create material BOM: Initial Screen. At the top, there are buttons for 'Check entries', 'Copy From ...', 'Create variant of...', and 'More'. The main area has a field labeled 'Material' with the value 'TS422_FG103'. Below it, there are three numbered fields: 1. 'Plant' with value '1710' and description 'Plant 1 US'. 2. 'BOM Usage' with value '1' and description 'Production'. 3. 'Alternative BOM' with an empty input field. A section titled 'Validity' contains fields for 'Change Number' (empty), 'Valid From' with value '20.07.2021', and 'Revision Level' (empty).

Figure 2.20 Creating a BOM

The following list describes each of the BOM aspects:

1 Plant

As shown in [Figure 2.20](#), a BOM can be created for a material at a plant level or independent of any plant (group BOM). After a group BOM is created, it can be extended to different plants. A material master with plant-specific data is mandatory to extend a BOM to a plant.

[»] Note

You can also create a BOM without specifying any plant during the creation process. This way, the BOM can be available for the entire company. As a next step, you can assign the group BOM to a specific plant. The system will check whether the material is already extended to the plant or not.

2 BOM Usage

The BOM usage controls the activities and functions the system can perform based on business functions and processes. You can create a single BOM for all areas of a company or a separate BOM for different purposes such as design and engineering, production, and sales and distribution. If separate BOMs are created, then you can use BOM reporting to fetch department-specific information.

As shown in [Figure 2.21](#), BOM usage customization can be accessed with **SAP IMG • Production • Basic Data • Bill of Material • General Data • BOM Usage**, or with Transaction OS20.

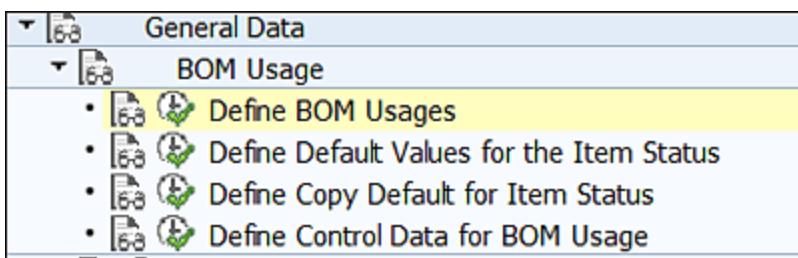


Figure 2.21 BOM Usage: Customization

The default item status can be defined with the BOM usages, which we'll cover more in detail in the next sections. But the important point is that with the BOM usage, you can control the relevancy of the items to which part of the organization is relevant; for example, if the BOM usage is production, then obviously the item will be production relevant, but which other

statuses are optional or not relevant can be defined here as well, as shown in [Figure 2.22](#).

[»] Note

Allowed material types for **BOM Usage** can be defined with Transaction OS24.

③ Alternative BOM

The alternative BOM is one of the technical types, that is, a multiple BOM. At the time of creating the BOM, the system creates the BOM with Alternative 01. For the same material, if you want to create additional BOMs, either system will create the next alternative. If you specifically maintain an alternative, then the system will check the availability of that alternative. We'll discuss more about the other BOM technical types in the next sections.

④ Valid From

While creating a BOM, the system automatically determines the current date as the valid from date, but you can overwrite it. If you use a change master for BOM creation, the system will use the valid from date from the change master. The validity period is the time from which the BOM header or BOM item is valid.

The valid to date is defaulted to December, 31st, 9999. The valid to date rule will be different when using a change master, which we'll discuss in the next sections.

| Change View "BOM Usage - Item Statuses": Overview | | | | | | | |
|---|-------|----------|-------|----|-------|---------|------------------------|
| BOM Usr | Prod. | Eng/des. | Spare | PM | Sales | CostRel | Usage text |
| 1 | + | - | - | - | - | - | Production |
| 2 | - | + | - | - | - | - | Engineering/Design |
| 3 | - | - | - | - | - | - | Universal |
| 4 | - | - | - | + | - | - | Plant Maintenance |
| 5 | - | - | - | - | + | - | Sales and Distribution |
| 0 | + | - | - | - | - | - | Predictive MRP |

Figure 2.22 BOM Usage: Item Statuses

2.4.2 Header Details

The BOM header shows information related to the entire BOM, as shown in [Figure 2.23](#).

The screenshot shows the SAP BOM Header Details screen. At the top, there are several input fields: Material (TS422_FG103), Plant (1710 Plant 1 US), BOM (00000211), Alternative BOM (1), BOM Usage (1 Production), Technical type (M Multiple BOM), and BOM group (TS422_FG103-GROUP). Below these are tabs for Quantities/Long Text, Additional Data, Administration Data, and Document Assignment. The Quantities/Long Text tab is active, displaying fields for BOM Description (empty), Alternative Text (empty), Quantity Data (Base quantity 1, From Lot Size empty, To empty), and Validity (Change Number empty, Valid From 20.07.2021, Authorization group empty, Deletion Indicator empty, BOM Status 1, Deletion Flag empty).

Figure 2.23 BOM Header Details

Following are the important fields in the BOM header:

- **BOM**

This number will be assigned by the system automatically.

- **Technical type**

If you create a multiple BOM—that is, more than one alternative system will show it as a multiple BOM—the system will show whether a BOM is a **Simple BOM** (blank), **Multiple BOM (M)**, or **Variant BOM (V)**.

- **Quantities/Long Text**

This tab page is the most important part of the header details screen, as shown previously in [Figure 2.23](#):

- **BOM Description** refers to the text related to the entire BOM or the BOM group and contains information related to all the alternatives (multiple BOMs) or all the variants in the variant

BOM. **Alternative Text** refers to the individual alternative or the variant BOM which you're looking into.

- **Base quantity** is defaulted to **1**, which means you must build the BOM so that all the components are required to build one unit of header material. The default base quantity can be changed with Transaction OS28, as shown in [Figure 2.24](#). These default values are at the client level and apply for all BOM categories.

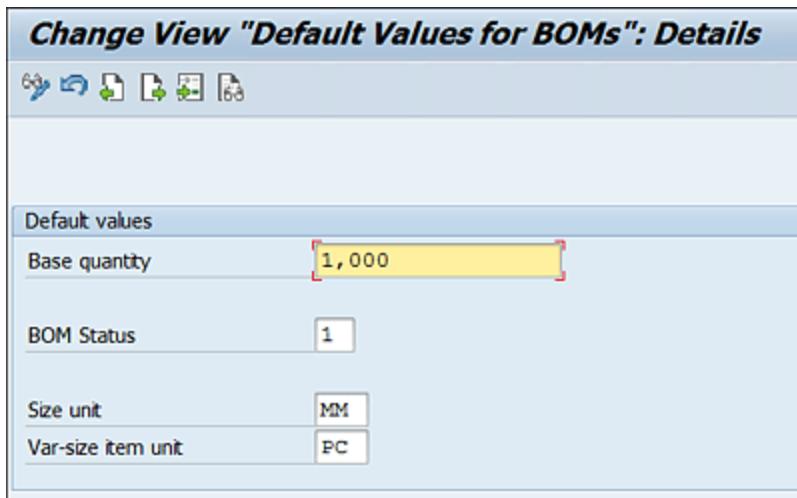
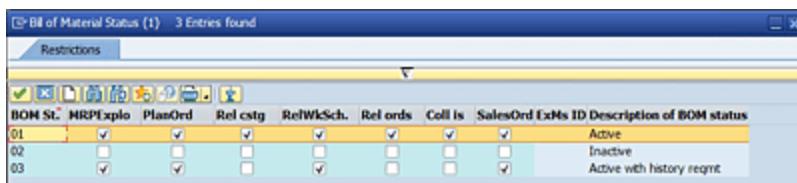


Figure 2.24 BOM Default Values

- **BOM Status** will be proposed from the default values maintained in [Figure 2.24](#). The BOM status defines which application areas use this BOM with the status, such as MRP explosion (**MRPExpl**o), planned order (**PlanOrd**), release costing (**Rel cstg**), and so on, as shown in [Figure 2.25](#).



| BOM St. | MRPExpl | PlanOrd | Rel cstg | RelWkSch. | Rel ordrs | Coll is | SalesOrd | ExMs ID | Description of BOM status |
|---------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|---------------------------|
| 01 | <input checked="" type="checkbox"/> | Active |
| 02 | <input type="checkbox"/> | Inactive |
| 03 | <input checked="" type="checkbox"/> | Active with history reqmt |

Figure 2.25 BOM Status

- The **Deletion** flag can be set if you want to archive and delete the BOM with the next archiving run. If you want to delete a BOM permanently, you can do that in Transaction CS02 (Change Material Bomb). When you're in BOM change mode, from the header view or item view, navigate in the **Material BOM • Delete**. By using engineering change number (ECN), it won't be easy to delete the BOM, because it needs a special authorization. Only the responsible users should have the authorizations. We'll discuss this topic in detail in the next sections.

2.4.3 Item Details

From the **Create Material BOM: Initial Screen** shown in [Figure 2.20](#), the system will take you to the next screen, which is the **Create material BOM: General Item Overview** screen shown in [Figure 2.26](#). All the components are maintained here that will be used to build the header material (assembly). The mandatory fields, apart from the component, are the **ICt** (item category), **Quantity**, and **UoM**.

| Create material BOM: General Item Overview | | | | | | | |
|--|----------------------------|-----------------------|-----------------------|-----------------|------|-------------------------------------|-----------------------|
| Material | | Header Details | | | | | |
| Material | T5422_PG103 | Plant | 1710 Plant 1 US | Alternative BOM | | Validity | |
| Position | Effectivity Initial Screen | | | | | | |
| Material | Document | General | | | | | |
| Item | ICt | Component | Component description | Quantity | U... | Asm SIs | Valid From |
| 0010 L | T5422_BPG103 | TS422_Subassembly-103 | | 1 | PC | <input checked="" type="checkbox"/> | 24.07.2021 31.12.9999 |
| 0020 L | T5422_BPG102 | TS422_Subassembly-102 | | 1 | PC | <input checked="" type="checkbox"/> | 24.07.2021 31.12.9999 |
| 0030 L | RM125 | RAW129,PD | | 2 | PC | <input type="checkbox"/> | 24.07.2021 31.12.9999 |
| 0040 | | | | | | <input type="checkbox"/> | |

Figure 2.26 BOM Item (Component) Overview

Following are the different BOM item categories (you must select one):

- Stock item (L)**

This is the most widely used item category. If you keep the stock

of components, then this is the right item category. MRP considers these materials in planning and creates dependent requirements. When converting the planned order to the production order, dependent requirements will become order reservations.

- **Nonstock materials (N)**

You can enter nonstock materials also as BOM components. The nonstock items may or may not have a material number. Item text is mandatory for items without a material number. For material numbers, purchasing information must be maintained in the item view. During an MRP run, the system will create a purchase requisition for this material, instead of dependent requirements.

- **Variable size items (R)**

Different sized materials can be maintained with this item category, for example, pipes or sheet metal. MRP will calculate the quantity from the size and formulas maintained.

- **Class item (K)**

The class item can be used for the variant configuration scenario to maintain the BOM and to reduce the maintenance effort of the BOM.

- **Text item (T)**

With this item category, you can maintain text of any length.

[»] Note

In this section as it relates to BOMs, we'll use **Item Category L** (stock items) for the components to build a material BOM.

When you double-click on the BOM item, the item details screen will open, as shown in [Figure 2.27](#). The following are the most important fields in the **Basic Data** tab page:

- The **Quantity** value is taken directly from the item overview screen. This is the quantity required to produce the base quantity of the assembly.
- If the **Fixed Quantity** checkbox is selected, then the component quantity maintained is fixed, and it won't vary proportionately based on the order quantity.
- **Operation scrap in %** and **Component Scrap (%)** are used to maintain the scrap percentage at the item level. Component scrap maintained in the BOM item will be considered priority over the component scrap percentage maintained in the material master **MRP 4** view.
- The **Net ID** indicator should be selected if you maintain **Operation scrap in %**. This indicator determines whether the scrap quantity is calculated on the net required quantity without considering the assembly scrap maintained in the material master.
- Select the **Recurs. allowed** checkbox if the component is the same as the higher-level assembly. For example, in the aluminum production industry, small quantities of aluminum are often added. If this indicator is selected, then the system will allow the recursiveness and won't check the recursiveness during the MRP run.
- **AltItemGroup** can be used if more than one component in the BOM can be used as an alternative to each other. More than one component can be an alternative. It's required to maintain usage probability, relative priority, and the strategy to manage the alternative components.

At times, some components are discontinued for various reasons. To handle the discontinuation, click the **Discontin. data** button and maintain appropriate discontinuation data. A prerequisite in

maintaining this data in **BOM Item** is to maintain the appropriate discontinuation data in the material master of the item.

The screenshot shows the SAP Fiori interface for BOM Item Details. At the top, there are fields for Material (T5422_FG103), Plant (1710 Plant 1 US), and Alternative BOM (1). Below this is a navigation bar with tabs: Basic Data (selected), Status/Long Text, Administration, and Document Assignment. The main area is titled 'T5422_Subassembly-103' and contains several sections: Item category (Stack item), Item ID (00000001), Sort String, Sub-item ID, Seg. maintained, and Seg. Value. Under Quantity Data, there are fields for Quantity (1), Fixed Quantity, Operation scrap in %, Component Scrap (%), and Net ID. In the General Data section, there are two columns: Co-product, AltItemGroup, and Reference point on the left; and Recurs. allowed, CAD Indicator, ALE indicator, Lead-time offset, Oper. LT offset, Distribution key, Phantom item, Explosion type, and Special Procurement on the right. The 'Discontin. data' button in the General Data section is highlighted with a yellow background.

Figure 2.27 BOM Item Details

- **Lead-time offset** and **Oper. LT offset** are used when a component is needed before or after the start of the production or operation starts. A positive value in these fields indicates that the component is required after the production or operation starts. A negative value indicates that the components are needed before the start of production or operation.
- **Distribution key** can be used if you don't want the system to provision the entire component quantity but instead distribute/split the quantity into smaller quantities between the order start and the order finish dates to provision the component.
- If you want a component to be procured with special procurement specifically for this BOM, the **Special Procurement** field is used. Otherwise, the procurement type and special procurement type maintained in the material master will be taken over. The most-used special procurement types are phantom assembly and direct production.

The **Status/Long Text** tab page of the item details screen is used to capture the item status, which we already discussed earlier. The other fields of importance are as follows: The **Material Provision indicator**, which mainly identifies whether a material is provided by a customer or vendor. The **Bulk Material** indicator is used in the BOM if this material is sometimes used as bulk material. If the material is always used as bulk material, then maintain this indicator in the material master. The **Storage Location** maintained in the BOM item is considered over the storage location maintained in the material master. If you want to use **Supply Area** for the item, then maintaining the relevant production storage location is required. Lastly, **Item Text 1** and **Item Text 2** are used to capture a text of 40 characters each in both lines (total of 80 characters).

2.4.4 Additional Topics Related to BOM

As you create your BOM, be sure to keep the following points in mind:

- **Technical types**

In general, many common components are used to produce varieties of assemblies in any typical manufacturing company. SAP S/4HANA supports three technical types of BOMs—**Simple BOM**, **Variant BOM**, and **Multiple BOM**. When creating the BOM, the system will always create the first alternative, **Simple BOM**, and the **Technical type** will be blank, as shown in [Figure 2.28](#).

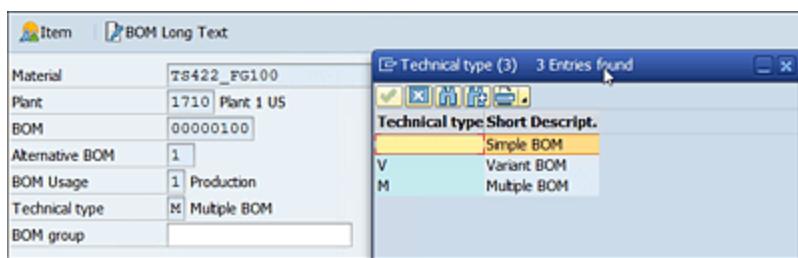


Figure 2.28 BOM Technical Types

When the same product can be manufactured with different sets of components, many BOM alternatives can be created for the same product. Different alternatives can be based on slightly changed components or because of different dates or lot sizes. SAP S/4HANA is capable of handling up to 1,000 alternatives for a product. All the BOM alternatives are captured under one internal BOM number and different alternatives. The system creates the first alternative automatically, if not specified, and from the next time onwards, the system will pick the next higher alternative number and proceed up to 99. If you want more alternatives to be created, then you can manually input the letters, special characters, and number combinations to create different alternatives. Even though technically it's possible to create many alternatives for a product, rarely are 1,000 alternatives for a product used in practice. The technical type is represented as M – **Multiple BOM**, as shown in [Figure 2.28](#).

- **Variant BOMs**

Variant BOM refers to the different products that are manufactured with an almost identical set of components. The technical type is represented as V – **Variant BOM**, as shown in [Figure 2.29](#).

| Display material BOM: Header Overview | |
|---------------------------------------|---|
| | Item |
| | Summ. BOM |
| | Alternative Long Text |
| | BOM Long Text |
| Material | TS422_FG101 |
| Plant | 1710 Plant 1 US |
| BOM | 00000101 |
| BOM Usage | 1 Production |
| Technical type | <input checked="" type="checkbox"/> Variant BOM |
| BOM group | |

Figure 2.29 Variant BOM

Variant BOMs can only be created from a simple BOM, as variants of this BOM. The main simple BOM will also receive the technical

types as the variant BOM after a variant BOM is created with reference to this BOM. Each variant will have different material numbers, but all the variants will have the same internal BOM number. You can create up to 99 variants.

- **Low-level codes**

The system will assign a low-level code for each material in the BOM structure. A material can be at any level of the BOM structure. This low-level code is used for planning with MRP and for costing purposes. The low-level code for a BOM structure is shown in [Figure 2.30](#).

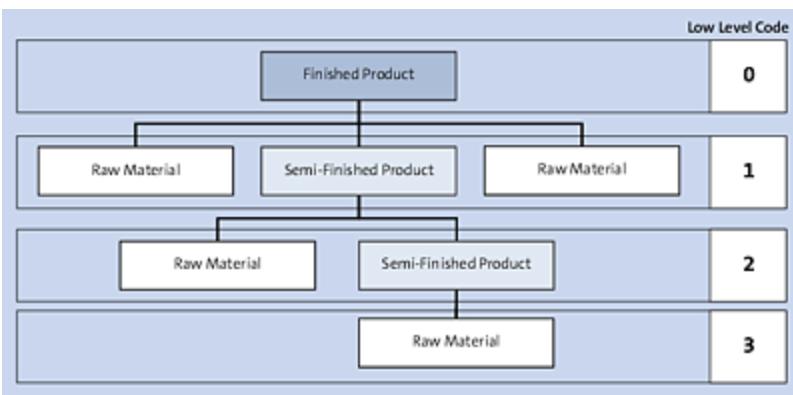


Figure 2.30 BOM Low-Level Code

[»] Note

The usage of the low-level code of a material in the planning process is explained in [Chapter 4](#).

- **Phantom assemblies**

As the name indicates, phantom assemblies are imaginary in nature, but are used to group materials logically. Phantom assemblies won't be assembled or built. Phantom BOMs will be exploded, and order reservations are created for all the components in the phantom assembly. The phantom assembly

itself won't be planning relevant, and structurally all the components are aligned to the superior assembly.

In SAP S/4HANA, if you want a material to always be in a phantom assembly, you can define the material as a phantom with **Special Procurement Type – 50** (phantom assembly). If you want to use an assembly as a phantom assembly in a specific case, then in the BOM item details, you can maintain the special procurement as a phantom assembly. It's also possible to switch off the phantom in the BOM item details. SAP S/4HANA provides the flexibility for either case.

BOM Reporting

Various BOM reporting functions are available, as shown in [Figure 2.31](#). The most widely used is **Where-Used List, BOM**

Comparison, and Explode: Level by Level BOM.

| |
|---|
| • <input checked="" type="checkbox"/> CS11 - BOM Level by Level |
| • <input checked="" type="checkbox"/> CS12 - Multilevel BOM |
| • <input checked="" type="checkbox"/> CS13 - Summarized BOM |
| ↳ Order BOM |
| ↳ WBS BOM |

| |
|---|
| • <input checked="" type="checkbox"/> CS11H - Explode: Level by Level BOM |
| • <input checked="" type="checkbox"/> CS12H - Explode: Multilevel BOM |
| • <input checked="" type="checkbox"/> CS13H - Explode: Summarized BOM |

| |
|--|
| • <input checked="" type="checkbox"/> CS15 - Material |
| • <input checked="" type="checkbox"/> CS15M - Multiple Material |
| • <input checked="" type="checkbox"/> CSD5 - Document (Single-Level) |
| • <input checked="" type="checkbox"/> CSCS - Class (Single-Level) |
| • <input checked="" type="checkbox"/> CS14 - BOM Comparison |

| |
|--|
| • <input checked="" type="checkbox"/> CS80 - Material BOM |
| • <input checked="" type="checkbox"/> CV80 - Document Structure |
| • <input checked="" type="checkbox"/> IB80 - Equipment BOM |
| • <input checked="" type="checkbox"/> IB81 - Functional Location BOM |
| • <input checked="" type="checkbox"/> CS81 - Standard BOM |
| • <input checked="" type="checkbox"/> CS82 - Order BOM |
| • <input checked="" type="checkbox"/> CS83 - WBS BOM |

Figure 2.31 BOM Reporting Functions

2.5 Work Centers

The work center is the place where production activities are performed. Work centers can be a production facility, production line, a machine/group of machines, or employees/group of employees directly involved in the production process. Work centers are one of the most important pieces of master data for production planning and production execution.

Work centers are assigned to task lists, for example, routings. The data maintained in the work centers is used for different purposes, such as scheduling, capacity planning, costing, and so on. Work centers can be arranged in hierarchies. They can be used to cumulate available capacities and capacity requirements in a hierarchy work center, which is important for capacity planning. In the next subsections, we'll cover various screens/tabs in the work centers, including **Basic Data**, **Default Values**, **Capacities**, **Scheduling**, and **Costing**.

2.5.1 Creating Work Centers

In discrete manufacturing, work centers can be created with Transaction CR01, as shown in [Figure 2.32](#), and can be changed/displayed with Transactions CR02 and CR03. In addition, a

work center can be copied with reference to an existing work center. The work centers are always created at the plant level.

The screenshot shows the SAP 'Create Work Center: Initial Screen'. At the top, there is a header bar with the SAP logo and the title 'Create Work Center: Initial Screen'. Below the header, there are two tabs: 'Basic Data' (selected) and 'More'. Under the 'Basic Data' tab, there are several input fields:

- * Plant: 1710
- * Work center: T-422-01
- Work Center Category: 0001

Below these fields, there is a section titled 'Copy from:' with two empty input fields:

- Plant: [empty]
- Work Center: [empty]

Figure 2.32 Work Center: Create

While creating the work center, maintaining the **Work Center Category** field is mandatory, which determines the screen sequence, mandatory or optional data to be maintained, task list types, and whether change records will be maintained. The work center category can be customized with Transaction OP40.

Work centers are called *resources* in process manufacturing, and resources can be created with Transaction CRC1.

2.5.2 Basic Data

As shown in [Figure 2.33](#), various administrative data is maintained in this screen. The **Plant**, **Work center**, and **Work Center Category** are inherited from the entry screen when the work center was created. The work center description should be maintained as a

mandatory requirement. **Person Responsible**, **Location**, **QDR System**, and **Usage** make up the administrative data.

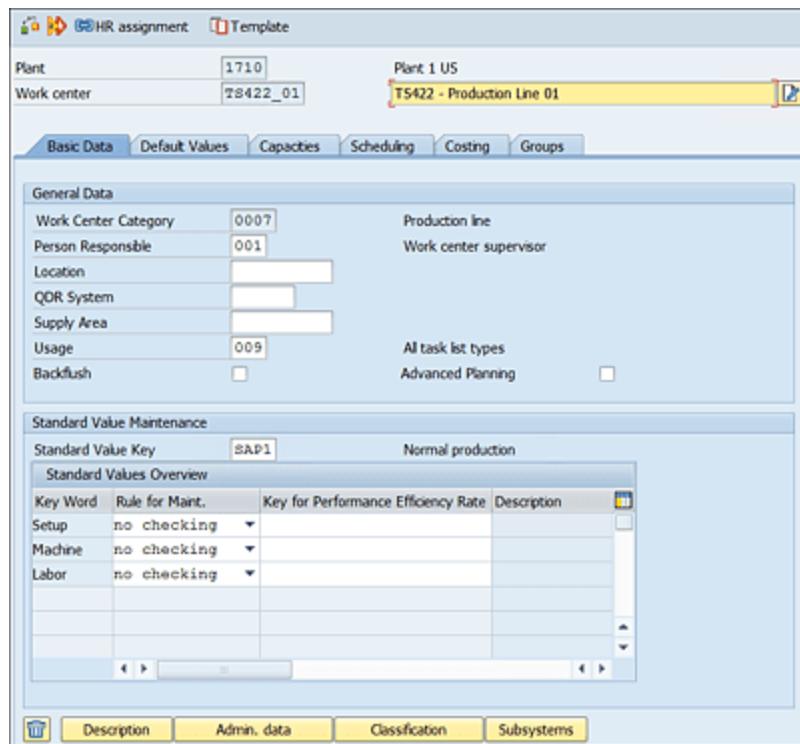


Figure 2.33 Work Center: Basic Data

The following list describes the most important fields that impact the manufacturing processes and how you maintain and manage these fields:

- **Supply area** is also known as the production supply area and is used as an interim storage space or location near to the work center in the production shopfloor. The production supply area is used in Kanban and with SAP Extended Warehouse Management.
- If the **Backflush** indicator is checked, this indicates that the components are backflushed. This indicator works in conjunction with the material master of the component. If the selection in the material master **Backflush** field is **Work center** decides whether

to backflush, then this field in the work center will be important to where the operation is carried out.

- The **Advanced Planning** indicator is important if you're going to use this work center in the PP-DS component for advanced planning and detailed scheduling activities. If this indicator is selected, then the work center (called *resource* in PP-DS) will be created automatically in PP-DS. For further details, refer to [Chapter 9](#).
- **Standard Value Key** represents the standard values that will be displayed for the work center. The standard values represent the activities you perform at the work center during operation and are to be measured/captured while performing the confirmation process.

As shown in [Figure 2.33](#), when you select the standard value key **SAP1**, it brings up the standard values **Setup**, **Machine**, and **Labor**. For standard value key customization, choose **Production** • **Basic Data** • **Work Center** • **General Data** • **Standard Value** • **Define Standard Value Key** or use Transaction OP19.

[»] Note

You can create a standard value key with a maximum of six standard values.

You can set the standard values as optional or mandatory in the **Rule for Maint.** field. The performance efficiency rate key can also be maintained for costing and scheduling purposes in the **Key for Performance Efficiency Rate** field. If not maintained, the system considers the performance efficiency as 100%.

2.5.3 Default Values

Default values maintained in the work center will be copied into the task list (routing) operation for which the work center is assigned. This way, the administrative effort in maintaining operations or suboperations can be reduced. The default values screen is shown in [Figure 2.34](#).

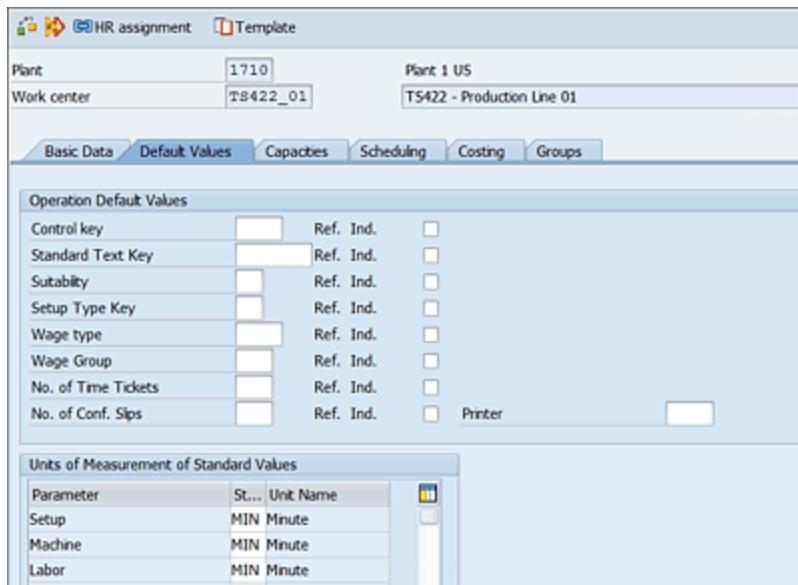


Figure 2.34 Work Center: Default Values

After you've maintained the default values and if these values aren't changed in the routing operation and suboperations, then you can maintain the **Ref. Ind.** (reference indicator) for each default value. With this indicator set, these values can only be changed in the work centers.

Standard text is used for the routing operation description. The standard text can be defaulted with the **Standard Text Key** field in

the **Default Values** screen. The standard text key can be created with Transaction CA10.

[»] Note

The reference indicator for the keys of performance efficiency rate (in the standard values) will be set internally by the system.

2.5.4 Capacities

Specific work is performed on work centers, so the work center capacity is maintained for this purpose. Different capacities, such as machine capacity and labor capacity, are defined either directly in the work center or separately.

In the work center **Capacities** tab, formulas related to setup, processing, teardown, and so on are maintained for each capacity category assigned. From this screen, you can navigate to the

capacity header as shown in [Figure 2.35](#), or you can create capacity with Transaction CR11.

The screenshot shows the SAP Work Center: Capacities screen. At the top, there are tabs: Intervals and Shifts, Intervals, Available Capacity Profile, Reference Available Capacity, and Short Texts. Below the tabs, the capacity header information is displayed:

| | | |
|-------------------|----------|----------------------------|
| Plant | 1710 | Plant 1 US |
| Work center | TS422_01 | TS422 - Production Line 01 |
| Capacity category | 001 | Vorschlagkapazität |

Under the General data section, the Capacity Responsible is set to 'A' and the Planner Group is 'A'. There is also a checkbox for Pooled capacity and a grouping field.

In the Available capacity section, the Factory Calendar is set to 'US', the Active Version is empty, and the Capacity Base Unit is 'MIN'. The Standard available capacity section shows the following data:

| | | | |
|------------------|----------|----------------------|--------|
| Start Time | 07:00:00 | Capacity Utilization | 100 |
| End Time | 16:00:00 | No. Ind. Capacities | 1 |
| Length of breaks | 01:00:00 | Capacity | 480,00 |
| Operating time | 8,00 | | MIN |

Under Planning details, there are checkboxes for Relevant to Finite Scheduling (checked), Overload (unchecked), Can be used by several operations (checked), and Long-term planning (checked).

Figure 2.35 Work Center: Capacities

In the **Available Capacity** section of the screen, **Active Version** can be defined in the capacity header. The system will adopt the plant calendar if the **Factory Calendar** value isn't entered for the work center capacity. Shifts can be defined during customization and entered for each work center in the **Intervals and Shifts** screen.

The number of individual capacities (**No. Ind. Capacities**) can be more than one; for example, if you have five similar machines available to perform a given work, then you can enter "5" in the **No. Ind. Capacities** field. Then, the available capacity will be five times the operating time.

[»] Note

The capacity (in base UoM) can be calculated as follows:

$$\text{Operating time (Capacity)} = (\text{Working time} - \text{Break time}) \times \text{Capacity utilization rate}/100$$

[»] Note

Further details about work center capacity are discussed in [Chapter 8](#).

Four kinds of capacities can be used in work centers:

- Work center capacities
- Pooled capacities
- Reference capacities
- Default capacities

Both reference capacity and default capacity are created to reduce the maintenance effort of capacities. Reference capacity is created as capacity data from which a capacity can be copied or referenced. The default capacity is created in Customizing for each capacity category and suggests the default values.

2.5.5 Scheduling

The **Scheduling** view in the work center is used to capturing formulas and interoperation times to enable performing scheduling tasks, as shown in [Figure 2.36](#).

The **Capacity with Capacity Category** maintained here is the basis for scheduling calculation. Pooled capacity can also be used for this purpose. Maintaining the formulas for execution time is important for setup and processing duration; otherwise, the execution time for these segments will be set to zero.

Interoperation times consists of move time and queue time. The **Standard Queue Time** field represents the time a workpiece or order waits for a work center for processing. **Minimum Queue Time** is the minimum time a workpiece/order waits for a work center. The queue time is also maintained in the routings.

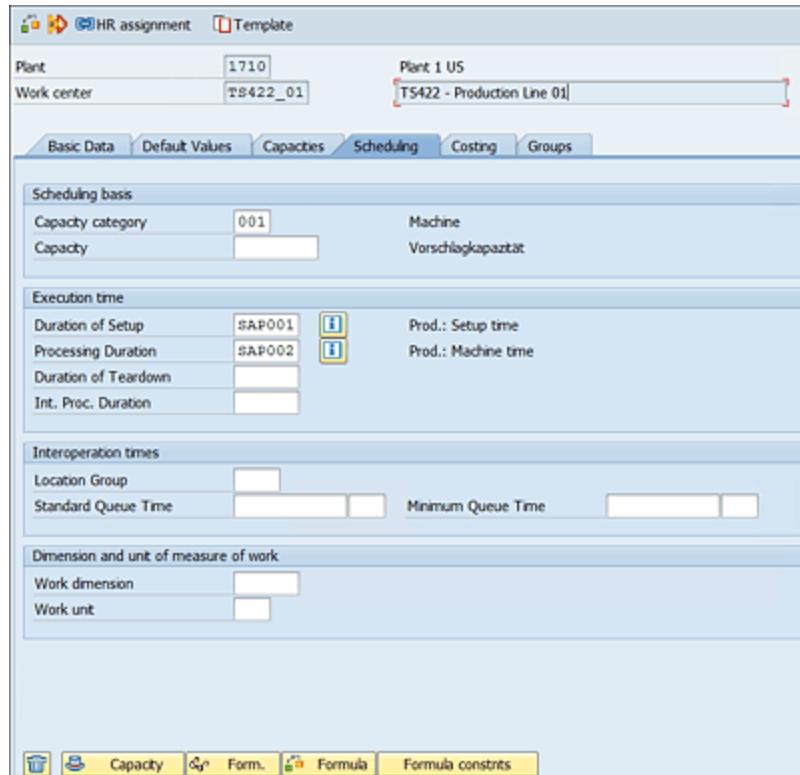


Figure 2.36 Work Center: Scheduling

2.5.6 Costing Data

Costing data in the work center is used to calculate the internal activities performed in manufacturing. Each work center is assigned to one cost center in a given time period, but you can assign many work centers to a cost center. For example, a manufacturing facility or a manufacturing department can represent a cost center where the many work centers that belong to this department will be assigned to the named cost center. A work center can belong to only

one manufacturing department; similarly, one work center can only be assigned to one cost center in a given time period. The work center **Costing** tab is shown in [Figure 2.37](#).

Work center costing information links manufacturing with the cost accounting component in SAP S/4HANA. The activity types are assigned to correspond with the standard values in the work center, and the standard values are maintained in the routing. The activity types have a price defined in costing via Transaction KP26 (Activity Type/Price Planning).

| At. Activity Text | Activity Type | Activity Unit | R... | Formula... | Formula description |
|-------------------|---------------|---------------|-------------------------------------|------------|----------------------|
| Setup | 3 | MIN | <input checked="" type="checkbox"/> | SAP005 | Prod: Setup rqmts |
| Machine | 1 | MIN | <input checked="" type="checkbox"/> | SAP006 | Prod.: Machine rqmts |
| Labor | 11 | MIN | <input checked="" type="checkbox"/> | SAP007 | Prod.: Labor rqmts |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |

Figure 2.37 Work Center: Costing Information

The formula key is assigned for each activity type. The reference indicator is set if you don't want the activity type to be changed in the routing.

Work Center Reporting

Various reports are available for work centers, as shown in [Figure 2.38](#). You can access the reporting from the SAP Easy Access Menu • Production • Master Data • Work Centers • Reporting.

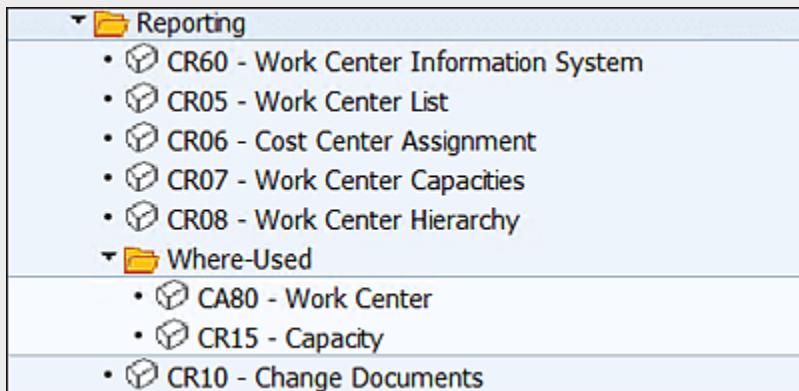


Figure 2.38 Work Center: Reporting

[+] Tip

Work centers are used in task lists. Various topics related to work centers are covered in the next section on routings.

2.6 Routings/Task Lists

Routings, along with work centers and BOMs, form the most important master data in production planning. Routing is the sequence of operation steps that will be performed to manufacture a product, including the details of the operations, the duration to carry out the operations (standard values), in which work centers these operations are carried out, which materials are used to carry out the operations, and the required PRT (tools and fixtures).

Following are the types of routings/task lists that are relevant for production planning:

- Routing
- Reference operation set
- Rate routing
- Reference rate routing

[»] Note

Rate routing is discussed further in [Chapter 6](#).

In the following section, we'll focus on routing mainly the header data and operation data, as well as subordinate routing objects.

2.6.1 Creating a Routing

[Figure 2.39](#) shows the initial routing creation screen. To create a routing, you can use Transaction CA01 directly or choose **SAP Easy**

**Access • Production • Master Data • Master Data • Routings •
Routings • Standard Routings • CA01 – Create.**

Routings can be created for a material and plant combination on a specified date in the **Key Date** field. The **Key Date** field denotes that the routing will be available from that date onward, and you can create a routing with a key date either in the past or into the future. If not specified, the system will always propose the key date as today's date. If a routing is created with a change number in the **Change Number** field, the change number date will be the key date for the routing creation.

Routings can also be created without any reference to a material; in that case, it's created as a routing group without reference to any material. Routings in the group aren't required to be from the same plant. If the manufacturing process is the same or similar, then many materials from the same plant or different plants can have the same routing group. This reduces the manual effort in routing maintenance.

A simple created routing will have a standard sequence. Routings can also be created in a parallel sequence or alternative sequence, as follows:

- **Parallel sequence**

A parallel sequence enables you to use several parallel operations to manage different BOM components at the same time for the final assembly.

- **Alternative sequence**

Like the standard sequence, an alternative sequence is also a linear set of operations. This type is used, for example, in

production with different lot sizes, where the entire production process changes based on the lot size.

The screenshot shows the SAP Create Routing: Initial Screen. At the top, there's a header bar with the SAP logo and tabs for Header, Copy from, Routings, Sequences, Operations, and More. Below the header, there are several input fields:

- Material: TS422_FG100
- Plant: 1710
- Sales document: [empty]
- Sales Document Item: [empty]
- WBS Element: [empty]
- Group: [empty]

In the 'Validity' section, there are fields for Change Number, Key Date (set to 04.08.2021), and Revision Level. At the bottom, there's an 'Additional data' section with a Profile field. The 'Header' tab is highlighted in blue, indicating it is the active tab.

Figure 2.39 Create Routing: Initial Screen

2.6.2 Header Data

After you maintain the minimum details on the initial screen, then you'll navigate to the routing header details, as shown in [Figure 2.40](#). If not specified, the system will propose and create the routing **Group Counter** as 1. You can change the **Group Counter** value to any other number, letter, or alphanumeric combination.

The **Plant** code in the header details , is inherited from the initial screen of the routing. You can change the plant here if the material is maintained already in the corresponding plant. **Usage** and **Overall Status** are mandatory fields to be maintained. The **Usage** maintained here is 1, which means the routing is available for subsequent production processes. **Overall Status** is used for controlling the process stages of routing. The value here is 4 **Released (general)**, which indicates the routing is available for subsequent production processes. The routing status can be in the creation stage or only released for costing; in these cases, the routing won't be available for production processes. You can

maintain a **Planning Work Center** in the header details, which can be the bottleneck work center or critical work center that should be used for capacity leveling purposes for a planned order. The **Lot Size From** and **Lot Size To** field values will be proposed by the system, but you can change them as needed. The lot size UoM will be picked from the material master for which you're creating the routing. For a group routing, this field will be mandatorily maintained. The data maintained in the **Parameters for Dynamic Modification/Inspection Points** section of the screen will be the integration point between production planning and quality management in SAP S/4HANA.

From the header details screen of the routing, you can navigate to the **Assignment** (material assignment) screen , to assign the routing to other materials that follow the same manufacturing steps. The material can also be from a different plant if the material master is already created. The same material can also have different routings from different plants. *Long text* can be maintained for the routing from the header details screen.

Figure 2.40 Routing Header Details

2.6.3 Operation Data

In the following sections, we'll provide an overview of how operational data works. We'll also discuss the control key and reference operation set. The control key is an important object to be maintained for each operation and controls various business processes, and the reference operation sets simplify the routing maintenance and administrative effort.

Overview

After the header details are maintained, you can navigate to the **Operation Overview** area to maintain the individual operation steps to be carried out for manufacturing the product, as shown in [Figure 2.41](#).

The screenshot shows the SAP S/4HANA Operation Overview screen. At the top, there are buttons for Previous header, Next header, Header, Select all, Deselect all, Delete, Check, Long text, Reference, Work center, Allocation, Detail, Sequences, and More. Below these, the Group is set to #12710000 and the Material is TS422_F1230. The Group Counter is 5, and the Reference is TS422_FG130 - Finished Material. The table below lists five operations:

| Op... | SOp | Work... | Part... | * E... | Standard... | Description | Lo... | PMT | DL... | O... | Po... | E... | Se... | Base Quantity | U... | Setup | Unit | Activit... | Machine | Unit | Activit... | Labor | Unit | Activit... |
|--------------------------|------|---------|----------|--------|-------------|----------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------|------|-------|------|------------|---------|------|------------|-------|------|------------|
| <input type="checkbox"/> | 9E1B | | A5500000 | L719 | VBP1 | Assembly | <input type="checkbox"/> | 100 | PC | 30 | K2N | 3 | 10 | K2N | 1 | 10 | K2N | 11 |
| <input type="checkbox"/> | 9E29 | | TS422_F | L719 | VBP1 | Final Assembly | <input type="checkbox"/> | 100 | PC | 30 | K2N | 3 | 10 | K2N | 1 | 10 | K2N | 11 |
| <input type="checkbox"/> | 9E30 | | PACK00 | L719 | VBP1 | Packing | <input type="checkbox"/> | 100 | PC | 30 | K2N | 3 | 10 | K2N | 1 | 10 | K2N | 11 |
| <input type="checkbox"/> | 9E40 | | TESTING | L719 | VBP1 | Packing QM | <input type="checkbox"/> | 100 | PC | 30 | K2N | 3 | 10 | K2N | 1 | 10 | K2N | 11 |

Figure 2.41 Routing: Operation Overview

The details about each operation (e.g., work center where the operation is carried out) are maintained in this view. If suboperations are used, they are also maintained here. An operation can be processed in-house or processed externally, which is determined by the **Control Key** entry. For an in-house process operation, maintaining the standard values is required. If an operation isn't carried out in the plant, another plant can also be maintained. But make sure that both the plants belong to the same controlling area.

If you double-click on the operation number, you'll be taken to the operation details screen, as shown in [Figure 2.42](#).

You can enter the standard values for the operation and suboperations, which are the planned values to perform an operation or suboperation.

The standard values are used for the following important functions:

- Schedule in-house processed operations/suboperations based on the settings for externally processed operations.
- Determine capacity requirements for operations/suboperations.
- Calculate the planned costs for operations/suboperations.

If you scroll down on the operation details, you'll see the screen area shown in [Figure 2.43](#). The **Transfer to orders** section is mainly

related to suboperations, how to cumulate them, and whether to transfer the suboperations to the order.

The screenshot shows the SAP S/4HANA Routing: Operation Details screen. At the top, there are tabs for Previous operation, Next operation, Check, Long text, Work center, Routings, Sequences, Allocation, PRT, and More. Below the tabs, the Group is set to 41710000 and the Material is TS422_FG100. The Group Counter is 1, and the description is MTS - Packaging Line 1. The Material description is TS422-FG100 - Finished Material.

Operation

- Activity: 0010
- Control key: YBP1
- Plant: 1710
- Work center: ASSEMBLY
- Standard Text Key: Assembly
- Assembly: Assembly
- Long Text Exists:

Standard Values

| Conversion of Units of Measure | | | |
|--------------------------------|------|-----------|------------|
| Header | Unit | Operat. | Un |
| 1 | PC | 1 | PC |
| Std Value | Un | Act. Type | Efficiency |
| Setup: 30 | MIN | 3 | |
| Machine: 10 | MIN | 1 | |
| Labor: 10 | MIN | 11 | |
| Business Process: | | | |

Figure 2.42 Routing: Operation Details

The screenshot shows the SAP S/4HANA Routing Operation Details: Interoperation Times screen. It includes sections for Transfer to orders, Determination of Standard Values, CAPP, and Interoperation times.

Transfer to orders

- Cumulation Type:
- no suboperations:

Determination of Standard Values

- SV Determ. Type:
- Calculation date:
- Calculation basis:
- Standard value code:

CAPP

- CAPP prod. order:
- CAPP text created:

Interoperation times

- Reduction Strategy:
- Teardown/Wait Parallel:

| | | | | | |
|----------------------|----------------------|----------------------|---------------------|----------------------|----------------------|
| Maximum Wait Time: | <input type="text"/> | <input type="text"/> | Minimum Wait Time: | <input type="text"/> | <input type="text"/> |
| Standard Queue Time: | <input type="text"/> | <input type="text"/> | Minimum Queue Time: | <input type="text"/> | <input type="text"/> |
| Standard Move Time: | <input type="text"/> | <input type="text"/> | Minimum Move Time: | <input type="text"/> | <input type="text"/> |

Interoperation times for work center

| | | | |
|----------------------------|----------------------|---------------------------|----------------------|
| Standard Queue Time: 0.000 | <input type="text"/> | Minimum Queue Time: 0.000 | <input type="text"/> |
|----------------------------|----------------------|---------------------------|----------------------|

Figure 2.43 Routing Operation Details: Interoperation Times

In the **Interoperation times** section, you can manage the reduction strategy, which you can customize. Interoperation time consists of

wait time, queue time, and move time. During scheduling conflicts, the system will switch to the minimum interoperation times based on the reduction strategy.

If you scroll down further, you can see the **Splitting** and **Overlapping** sections, shown in [Figure 2.44](#). Based on the settings, the system will split the large production lot into several smaller lots considering the individual capacities set for it. Make sure that the individual splits mentioned are in line with the number of individual capacities maintained in the work center.

The screenshot shows the 'Splitting' and 'Overlapping' configuration sections. In the 'Splitting' section, there is a checkbox for 'Splitting Required' and two input fields for 'Max Number of Splits' and 'Min. Processing Time'. A note '(Economical Splitting)' is next to the processing time field. In the 'Overlapping' section, there are four radio button options: 'Required Overlapping', 'Optional Overlapping', 'Flow Manufacturing', and 'No Overlapping', with 'No Overlapping' selected. Below these are two input fields: 'Minimum Overlap Time' and 'Min. Send-Ahead Qty', followed by a 'PC' button.

Figure 2.44 Routing Operation Details: Splitting

If overlapping is required, then during scheduling, the system will determine the minimum overlapping time (**Minimum Overlap Time**) with the next (subsequent) operation and the minimum send ahead quantity (**Min. Send-Ahead Qty**).

If you scroll down the screen further, you can see the **General data** screen area shown in [Figure 2.45](#). The **General data** area is mainly

used to maintain the percentage of scrap, HR-related data, and costing relevancy.

| General data | |
|-----------------------|-------------------------------------|
| Scrap in %: | <input type="text"/> |
| No. of Time Tickets: | <input type="text"/> |
| No. of Conf. Slips: | <input type="text"/> |
| Wage Group: | <input type="text"/> |
| Wage type: | <input type="text"/> |
| Suitability: | <input type="text"/> |
| Number of employees: | <input type="text"/> |
| Setup Type Key: | <input type="text"/> |
| Setup group category: | <input type="text"/> |
| Setup group key: | <input type="text"/> |
| CostingRelevncv: | <input checked="" type="checkbox"/> |
| Non-Value-Added: | <input type="checkbox"/> |

Figure 2.45 Routing Operation Details: General Data

Further down the screen, you can see two more screen areas shown in [Figure 2.46](#). The control key determines whether an operation is processed internally or externally.

| External processing | |
|-----------------------|--|
| Subcontracting: | <input type="checkbox"/> |
| Purchasing Info Rec.: | <input type="text"/> |
| Outline Agreement: | <input type="text"/> |
| Sort Term: | <input type="text"/> |
| Material Group: | <input type="text"/> |
| Purchasing Group: | <input type="text"/> |
| Vendor: | <input type="text"/> |
| Planned Deliv. Time: | <input type="text"/> Days |
| Price unit: | <input type="text"/> |
| Net Price: | <input type="text"/> |
| Inspection Type: | <input type="text"/> |
| Recording View: | Single Values and Summarized Results (Default View) <input type="button" value="▼"/> |
| User-Specific Fields | |
| Field key: | <input type="text"/> <input type="button" value="🔍"/> |

Figure 2.46 Routing Operation Details: External Processing

For an externally processed operation, it's required to maintain the purchasing-related information. If the operation is subcontracted, you must also make sure to maintain the **Subcontracting** indicator.

During production order creation, when this operation data is copied to the order, upon saving, the system will create a purchase requisition based on the data maintained here.

If required, you can use the **Field key** field in the **User Specific Fields** screen area to add additional information as text (four fields), date (two fields), quantity (two fields), value/or currency (two fields), and checkboxes (two fields), as shown in [Figure 2.47](#). Transaction OPEC is used to define the user fields.

The screenshot shows a software interface titled "New Entries: Details of Added Entries". At the top, there are standard toolbar icons. Below the title, there is a section labeled "Field key" with two input fields. The main area contains a table with six rows, each representing a type of field: "Text", "Text", "Quantity", "Value", "Date", and "Checkboxes". Each row has two input fields. At the bottom of the table is a section labeled "Authorization object" with one input field. The entire interface is contained within a light blue border.

Figure 2.47 Routing Operation: User-Defined Fields

You can assign the formula parameters for user-defined quantity fields, and these formulas can be used in work centers.

Control Key

The **Control key** is mandatory field for each operation and contains various parameters, as shown in [Figure 2.48](#).

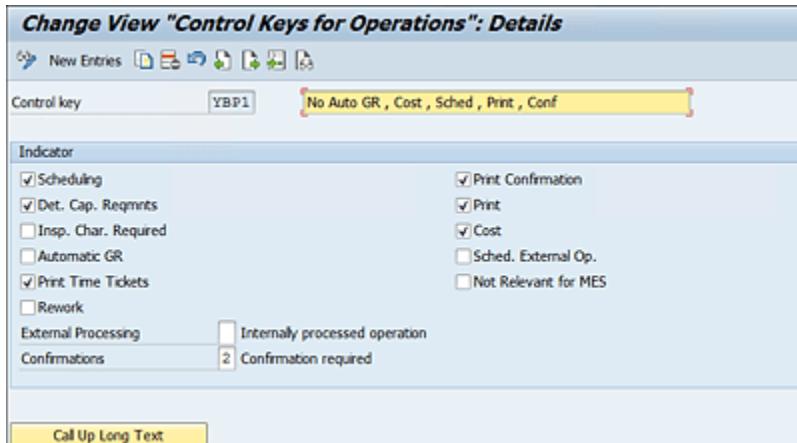


Figure 2.48 Control Key

The control key specifies which business processes are carried out for an operation in the planning and execution of orders. Various parameters in the control key determine whether an operation is relevant for scheduling and capacity planning, whether an operation is costing relevant, whether confirmation is required or optional, and whether it's an internally or externally processed operation. The control key is customized via Transaction OP67 or Transaction OPJ8.

[»] Note

With **Rework** indicator specifies an operation for rework. Automatic GR can't be posted for rework operations, so for rework quantities, the goods receipt should be posted manually. Rework

operations won't be taken into consideration for scheduling operations.

[»] Note

The settings in the control key for suboperations won't support the following fields: **Automatic GR** (automatic goods receipt), **Insp. Char. Required** (inspection characteristics required), **Rework**, and **Sched. External Op.** (scheduling externally processed operations).

Reference Operation Set

A reference operation set is used to create routings where some of the operations reoccur frequently. These can be referenced directly in the routings and are used to reduce administrative effort. The reference operation sets can't be used directly in production, however. If you change an operation in the reference operation set, the changes will affect all the routings wherever this reference operation set is used.

Reference operation sets can be created with Transaction CA11, changed with Transaction CA12, and displayed with Transaction CA13. A material can't be assigned to a reference operation set, and even though they have the same structure as a routing, only a standard sequence can be created for reference operation sets. Neither parallel nor alternative sequences are allowed. You can assign material components, PRTs and trigger points to an operation in a reference operation set. Whatever assignments you make in reference operation sets will be copied to the routing.

2.6.4 Subordinate Routing Objects

The following list describes the subordinate objects for routing:

- **Suboperations**

Suboperations are subordinate to an operation and are used for more detailed planning of the operation steps. They can be used for capacity planning and can be costing relevant. The standard values maintained in the suboperations will be cumulated in the corresponding operation. In the operation, you control whether to allow the suboperations to be copied to the production order or not. Make sure that the capacities and costs aren't calculated twice by selecting the appropriate control key.

[»] Note

Inspection characteristics, PRTs, and material components can't be assigned to suboperations; they can only be assigned to an operation.

- **Material component assignment**

Material components from the BOM can be assigned to individual operations so that they are available for the production process and component consumption. You can assign the components to operations in the operation overview by clicking **Allocation** (component allocation), as shown in [Figure 2.49](#), or by choosing **Goto • Allocation**.

You can assign, reassign, and delete the component assignment from the material component overview screen. You can set the **Backflushing** indicator for the components in the routing, material master, or work center. The **Backflushing** indicator maintained in the routing will always have the priority.

If not explicitly assigned, the components are always linked to the routing but not to any specific operation. But in the production process, the system assumes that all the components are needed at the start of the production and assigns all the components to the first operation. Then the staging of components will take place, and the production supply area assigned to the work center of the first operation will receive all the components.

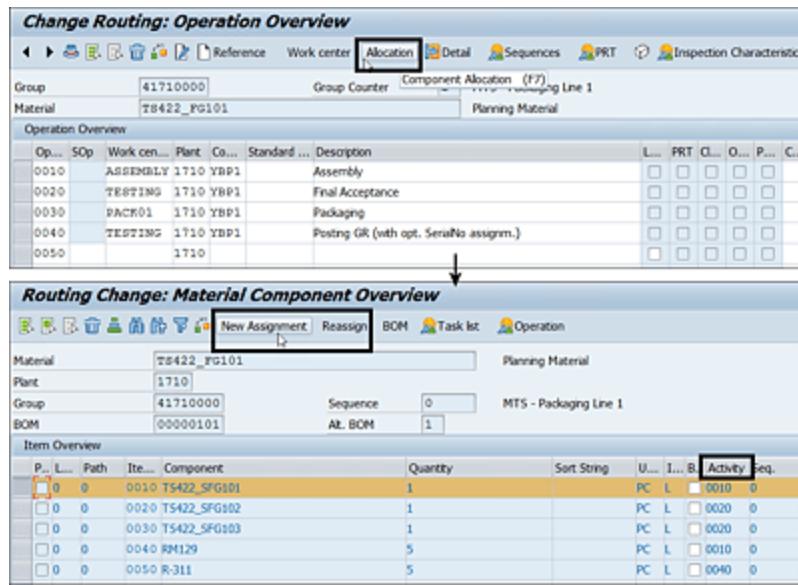


Figure 2.49 Operation: Component Allocation

- **PRT**

PRTs are used in the production process but won't be consumed. Some examples of PRTs are jigs, fixtures, or quality equipment used to test the material. If you need a PRT to perform an operation, then you must assign that PRT to the operation. There are several types of PRTs: PRT as equipment, PRT as a document, PRT as a material (material type FHMI), or PRT as a PRT master data (with Transaction CF01).

PRTs can be assigned to operations by accessing the **PRT** button from the menu. This assignment is like a component assignment

as discussed in the previous section. One marked difference is that the PRTs can be assigned to more than one operation.

- **Inspection characteristics**

What you want to inspect during an operation can be created as inspection characteristics in SAP S/4HANA. You can assign the inspection characteristics to an operation for which you want to perform the inspection. Use an appropriate control key that contains the **Inspection Characteristics Required** indicator for the operation. If you maintain this indicator, the system will include the operations in the quality management worklists for inspection results recording.

- **Trigger points**

Trigger points can be used to trigger certain functions in the production order such as releasing operations, inserting reference operation sets, creating an order by copying, and so on. You assign a standard trigger point to an operation. Standard trigger points can be created with Transaction CO31 or directly in the routing operation.

Mass Change and Routing Reporting

You can use Transaction CA85N to mass-replace work centers in routings. The system will copy the basic data, and, if the reference indicator is set, the default values, activity types, and key for performance efficiency rate will be copied to the routings.

Various reporting functions are available for routings, as shown in [Figure 2.50](#).

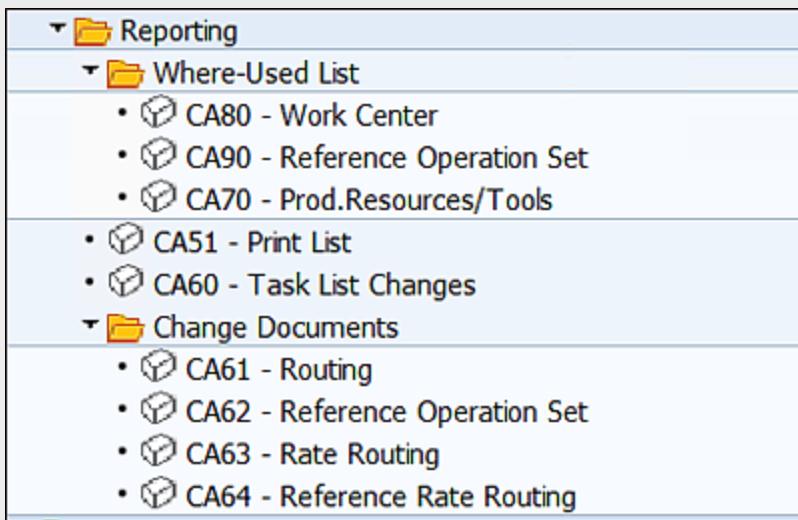


Figure 2.50 Routing Reporting Functions

2.7 Production Versions

The production version is a combination of BOM and routing/rate routing that determines the way a material is produced (see [Figure 2.51](#)). A material may have many BOMs, and each one requires different routing operation steps. With the production versions, the BOM and routing combination is defined. Production versions are mandatory with SAP S/4HANA. All the planning and execution objects (MRP, planned orders, and production orders) find the relevant BOMs and routings by way of a production version. This makes MRP sourcing simpler by having only one option to determine the BOM and routing. Because the PP-DS production version is mandatory, now the sourcing logic is similar and consistent both in MRP and PP-DS.

[»] Note

Production versions are the source of supply in SAP S/4HANA, which is discussed in detail in [Chapter 4](#).

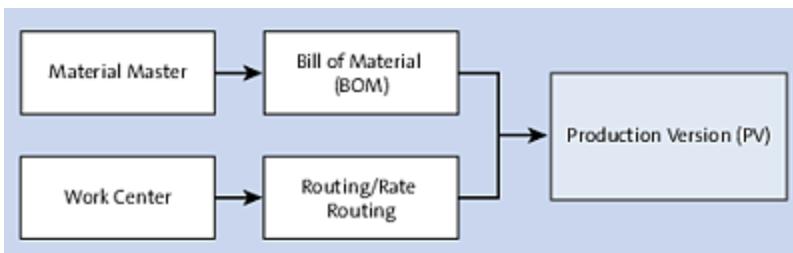


Figure 2.51 Production Version

Production versions can be created based on a specific quantity range and specific validity period. But if the system finds more than one production version, then the first available production version will be picked for assignment in the production order.

You can create production versions in the material master MRP 4 view, as shown in [Figure 2.52](#). An additional feature added to production versions in SAP S/4HANA is that you can now lock the production version for automatic sourcing. If you set this option (**Prod. Vers. locked**), then MRP can't select the production version automatically.

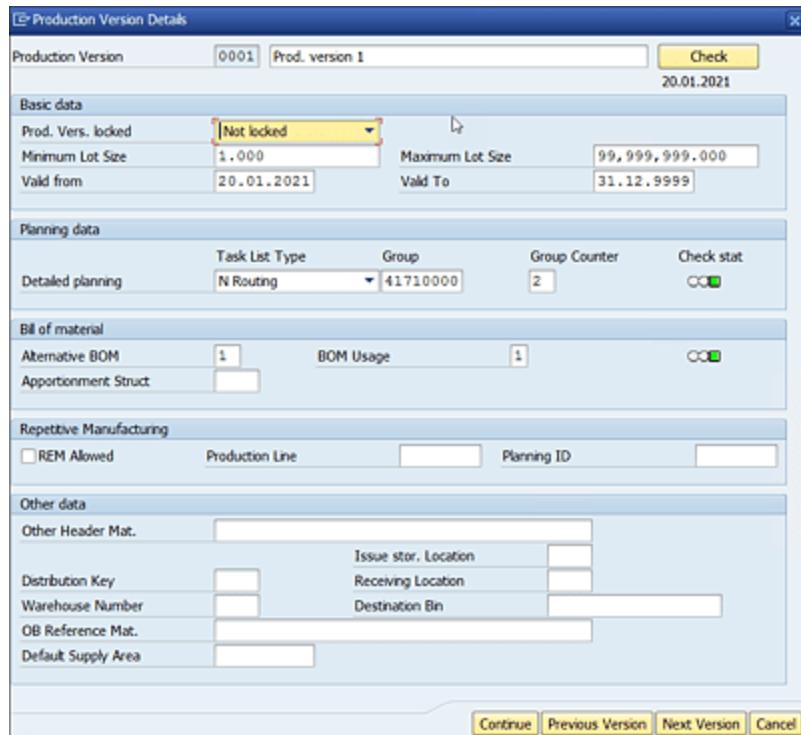


Figure 2.52 Production Version Maintenance

You can create production versions in mass with Transaction C223. The transaction also allows you to directly select and maintain the

values for many production versions related to many materials, as shown in [Figure 2.53](#).

| Production Version: Mass Processing | | | | | | | | | | | | | | | | |
|--|--------------------|-------|--------------------|----------------|------|-----------------|----------------------------------|----------------------------------|----------|---------------|------------------|------|-------------------------|-------------|--------|--|
| Selection Conditions | | | | | | | | | | | | | | | | |
| Plant | 1710 | Plant | Plant 1 US | | | | | | | | | | | | | |
| Material | | | MRP Controller | Task List Type | | | | | | | | | | | | |
| Key date | 10.04.2011 (Group) | | Production Line | | | | | | | | | | | | | |
| <input type="button" value="New"/> <input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="Copy"/> <input type="button" value="Print"/> <input type="button" value="Close"/> | | | | | | | | | | | | | | | | |
| Consistency Check | | | | | | | | | | | | | | | | |
| Assign Change Number | | | | | | | | | | | | | | | | |
| Document | | | | | | | | | | | | | | | | |
| Edit Master Recipe | | | | | | | | | | | | | | | | |
| Copy Range | | | | | | | | | | | | | | | | |
| ID / 00 | | | | | | | | | | | | | | | | |
| Production Versions | | | | | | | | | | | | | | | | |
| Plant | Material | Pvs. | Produktion Version | T. | Task | M., F., C., T., | Check date | Valid from | Valid To | From Lot Size | To Lot Size | Unit | Obj... S... Ap... Group | Obj... Type | | |
| 1710 | TK412_P0000 | 0001 | Prod. version 3 | No. | ▼ | | 00000000000000000000000000000000 | 20.01.2001 20.01.2001 30.12.9999 | | 1.000 | 99,999,999,000PC | 1 | 3 | 417100000 3 | W Ro.. | |
| 1710 | TK412_P0002 | 0002 | Prod. version 3 | No. | ▼ | | 00000000000000000000000000000000 | 20.01.2001 20.01.2001 30.12.9999 | | 1.000 | 99,999,999,000PC | 1 | 3 | 417100000 3 | W Ro.. | |
| 1710 | TK412_PP0100 | 0002 | Prod. version 2 | No. | ▼ | | 00000000000000000000000000000000 | 20.01.2001 20.01.2001 30.12.9999 | | 1.000 | 99,999,999,000PC | 1 | 3 | 500000218 3 | W Ro.. | |
| 1710 | TK412_PP0101 | 0002 | Prod. version 2 | No. | ▼ | | 00000000000000000000000000000000 | 20.01.2001 20.01.2001 30.12.9999 | | 1.000 | 99,999,999,000PC | 1 | 3 | 500000217 3 | W Ro.. | |
| 1710 | TK412_PP0102 | 0002 | Prod. version 2 | No. | ▼ | | 00000000000000000000000000000000 | 20.01.2001 20.01.2001 30.12.9999 | | 1.000 | 99,999,999,000PC | 1 | 3 | 500000218 3 | W Ro.. | |
| 1710 | TK412_PP0103 | 0001 | Prod. version 2 | No. | ▼ | | 00000000000000000000000000000000 | 18.03.2001 18.03.2001 30.12.9999 | | 1.000 | 99,999,999,000PC | 1 | 3 | 500000219 3 | W Ro.. | |
| 1710 | TK412_PP0103 | 0002 | Prod. version 2 | No. | ▼ | | 00000000000000000000000000000000 | 18.03.2001 18.03.2001 30.12.9999 | | 200.000 | 000,000PC | 1 | 3 | 6 3 | W Ro.. | |

Figure 2.53 Production Version: Mass Maintenance

2.8 Engineering Change Management

With engineering change management, you can make changes to the production planning master data objects (e.g., material masters, BOMs, task lists). You have the option of changing without history or changing with history. If you change without history, the old data is overwritten. This is mainly used when the product is still in development. By changing the objects with change history, you can document the changes that have further dependencies with other objects.

Creation of change masters (engineering change masters) can be performed with Transaction CC01, as shown in [Figure 2.54](#). The engineering change number (ECN) can be an internally generated number or an external number, which you can customize based on the requirement. You can create a profile and assign it to each change master, which will reduce the effort of maintaining the change master data fields such as **Change no. status** (change number status), **Object Type**, **Status Profile**, and so on. From the change master, you can manage all the object types (BOMs, task lists, documents, materials, etc.). With object management records, you can maintain the objects (specific BOMs, routings, materials, etc.), or the system will create these records automatically when you use the ECN for changing these objects. Each ECN will have an effectivity date.

When you create a change with reference to the change master, the system takes the change master valid from date (effectivity date) as the date for all the changes, which means the change is valid from that date for all the objects (BOMs, task lists, material masters, etc.). If a BOM component is changed from one component to another,

then the previous component's effectivity ends one day prior to the change number effectivity date.

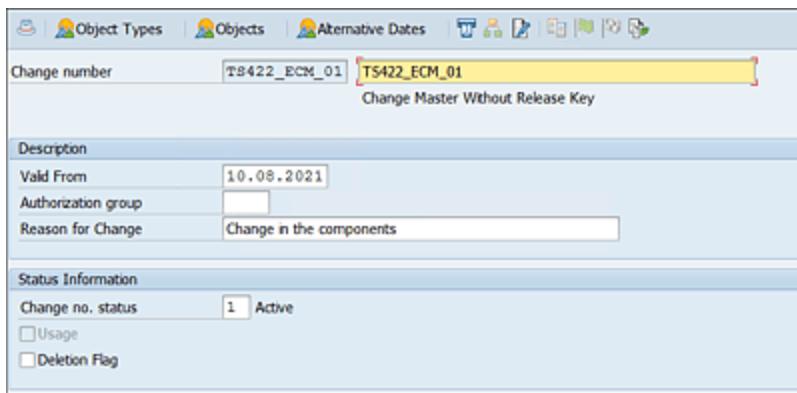


Figure 2.54 Engineering Change Management: Change Master

For BOM changes with change management, if you want to make the change master mandatory, you can manage the SAP authorization object C_STUE_NOH. In that case, the system will check for creation and change of BOMs, and, if a change master isn't used, then the system will stop the transaction with an error. In certain cases, it may be required to change a BOM without a change number. In that case, the same authorization object can be assigned to specific key users who are authorized to change the BOMs.

Using engineering change management for work centers isn't possible, but you can capture all the changes performed for a work center by activating the change documents per work center category in Transaction OP40. You can track the changes in Transaction CR10.

2.9 Important Terminology

In this chapter, the following terminology was used:

- **BOM**

A BOM is a structured list of all the components needed to produce an assembly/subassembly, which also contains the information on the item type, quantity, and UoM of the components.

- **Client**

The client is the highest organizational unit in SAP, which can be a company, a group of companies, or a group of subsidiaries.

- **Company code**

Company code is the legally independent company with one company code. It's a legal entity for which a complete set of accounts can be created.

- **Cost center**

A cost center belongs to a controlling area that determines where the costs are incurred.

- **Item category**

The BOM item category is a mandatory field which determines whether it refers to an object, whether it can be kept in stock, and so on.

- **Material master**

A material master is the central repository of information for manufacturing, procurement, sales, accounting, and so on.

- **Material type**

The material type determines the material master screen

sequence and number range maintenance, which determines various other properties of a material.

- **Plant**

A plant is an organizational unit, such as a manufacturing facility or a branch in a company.

- **Production version**

The production version is the combination of BOM and routing, which is mandatory master data for production planning in SAP S/4HANA

- **Rate routing**

A rate routing is a type of routing for repetitive manufacturing purposes. As the name indicates, the rate is maintained in the rate routing production.

- **Routing**

A routing contains the sequence of operations to be performed to produce the assembly.

- **Storage location**

A storage location is part of a plant where the inventory is stored.

- **Work center**

A work center is a place where specific work is performed.

- **Work center category**

The work center category is key to determining whether a machine, a production line, and so on is used; it also determines which data will be maintained.

2.10 Practice Questions

These questions will help you evaluate your understanding of the topics covered in this chapter. They are similar in nature to those on the certification examination. Although none of these questions will be found in the exam itself, they will allow you to review your knowledge of the subject. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers and only correct answers to receive credit for the question.

1. Which statements regarding material master numbering in SAP S/4HANA are correct? (There are three correct answers.)
 - A.** The material number is unique for a material.
 - B.** The maximum length of a material is 18 characters for an external number range.
 - C.** The maximum length of a material is 18 characters for an internal number range.
 - D.** It's required to activate and acknowledge the extended material length with Transaction FLETS.
 - E.** A template can be assigned to material numbers but without any additional characters.
2. BOM information is also used in what other activities in an organization? (There are three correct answers.)
 - A.** Sales orders
 - B.** Product costing
 - C.** Reservations and goods issue
 - D.** Material master maintenance
3. True or False: A BOM is always created as a single-level BOM.

- A.** True
 - B.** False
4. Which statements are correct regarding BOMs? (There are three correct answers.)
- A.** BOM usage controls which material types for BOM headers are allowed.
 - B.** When you create the BOM for the first time, it will have a blank technical type.
 - C.** It's not possible to allocate group BOMs to individual plants.
 - D.** You can create a BOM that is applicable to all the plants by maintaining special character “*”.
 - E.** Pipeline materials can't be assigned as a stock item in the BOM.
5. The production order default storage location for components can be defined in which of the following master data objects? (There are two correct answers.)
- A.** Material master of components
 - B.** Routing, in the component allocation
 - C.** Location field maintained in the work center
 - D.** BOM item details
6. True or False: Client is the smallest organizational unit for which self-contained accounts can be created.
- A.** True
 - B.** False
7. What statements are true concerning a plant? (There are three correct answers.)
- A.** A plant can belong to many company codes.

- B.** Several purchasing organizations can be assigned to a plant.
 - C.** Product costing can be performed across plants.
 - D.** A plant/division combination can be assigned to only one business area.
8. Which of the following statements are true regarding the material master? (There are two correct answers.)
- A.** It's always possible to change the industry sector of a material after you assign it.
 - B.** The material type determines the screen sequence, material number assignment, and procurement type.
 - C.** Maintaining the material master is a collective responsibility of different departments in an organization.
 - D.** It's possible to set the industry sector as default but not possible to set views and organization levels as default.
9. The material master can be created with which of the following transactions? (There are three correct answers.)
- A.** MM06
 - B.** MM11
 - C.** MMCC
 - D.** MM50
 - E.** MMAM
10. True or False: It's possible to change the base UoM of a material.
- A.** True
 - B.** False
11. How many variants can be created for a variant BOM?
- A.** 99

- B.** Up to 1,000
 - C.** 1
 - D.** Based on the number of components in the variant BOM
12. Which statements are correct with reference to BOMs? (There are two correct answers.)
- A.** Phantom assemblies will have the technical type P.
 - B.** The system will assign a low-level code for each material in the BOM structure.
 - C.** The BOM status shows which application areas the BOM can be used in.
 - D. Net ID** should be checked if the component is the same as the higher-level assembly.
13. During the greenfield implementation of SAP S/4HANA 2020, your key user informed you of the business requirement to capture electricity and water consumption confirmation of operations in the order, apart from setup, machine, and labor time. Which master data object will you set up for this purpose?
- A.** Work Center – Default values
 - B.** Work Center – Standard value with appropriate keys
 - C.** Work Center – Capacity categories for electricity and water consumption
 - D.** The electricity and water consumption costs can be captured as overheads with the management accounting component.
14. Which statements are correct with reference to work centers? (There are three correct answers.)
- A.** A cost center can be assigned with multiple work centers in a given time frame.

- B.** The capacity header can be created directly in the work center **Capacities** view.
 - C.** A factory calendar should mandatorily be maintained in the work center capacity header.
 - D.** Capacity with a capacity category will be used for scheduling calculations.
15. True or False: When you remove the reference indicator for a work center used in a routing, the default values from the work center aren't copied to the routing.
- A.** True
 - B.** False
16. What is the function of **Usage** in the routing header details?
- A.** The key specifies the areas in which the task list can be used.
 - B.** The usage describes the task list types used in PRT or work centers.
 - C.** The usage key identifies the processing status of a task list.
 - D.** You use this indicator to specify that the task list will be deleted with a deletion program.
17. Which of the following consists of interoperation times of an operation? (There are three correct answers.)
- A.** Queue time
 - B.** Setup time
 - C.** Processing time
 - D.** Wait time
 - E.** Move time
18. Which of the following can you assign to a routing operation?

- A.** Trigger points
 - B.** Material components
 - C.** PRTs
 - D.** All of the above
19. Which of the following is correct for reference operation sets? (There are three correct answers.)
- A.** Parallel and alternative sequences are allowed for a reference operation set.
 - B.** Operations that are standard for several task lists/routings can be defined as reference operation sets.
 - C.** You can assign PRTs to a reference operation set.
 - D.** Reference operation sets allow only the standard sequence.
20. You want to use suboperations in the routings for more detailed planning of the operation steps. You start investigating the best way to use the suboperations. Which of the following statements is correct with reference to suboperations? (There are two correct answers.)
- A.** The standard values maintained in the suboperations will be cumulated in the corresponding operation.
 - B.** It's possible to assign material components to a suboperation.
 - C.** Suboperations are always copied to the production order.
 - D.** There is a possibility that costs are calculated twice because of suboperations.
21. You're into an SAP S/4HANA greenfield implementation project and you're discussing the master data with the business team. Which of the following statements related to the production version are correct?

- A.** In comparison to SAP ERP, the production version is mandatory master data in SAP S/4HANA for in-house production and subcontracting.
 - B.** BOM will be selected for MRP based on the production version.
 - C.** Production versions can be created based on the specified quantity range and validity period.
 - D.** Sourcing logic is consistent for PP-DS and MRP.
 - E.** All of the above are true.
22. Which statements are correct for phantom assemblies? (There are three correct answers.)
- A.** Phantom assemblies are used to group components together.
 - B.** Phantom assemblies are planning relevant.
 - C.** Components in the phantom assemblies are aligned to the superior assembly.
 - D.** Special procurement key 50 is used to define a material as a phantom assembly.
 - E.** Phantom assemblies behavior can't be overwritten in the BOM.

2.11 Practice Answers and Explanations

1. Correct answers: **A, C, and D**

The material number is unique for a material; it can be an internal number or an external number based on the customization settings. With SAP S/4HANA, the length of material numbers is increased from 18 to 40 characters. But internal numbering is still 18 characters. If you want to use the extended material number length, you must activate and acknowledge that you understand the impact. A material master template can be assigned to material numbers, and the system considers the additional characters in the total length of the material number.

2. Correct answers: **A, B, and C**

The data stored in a BOM is used in different parts of the company. In the sales order, it helps with data entry. Sales-order-specific BOMs can be created. A BOM is an important piece of master data for calculating the costs of a product. Based on the BOM, reservations creation, material staging, and goods issue of the components takes place for orders.

3. Correct answer: **A**

A BOM is always created as a single-level BOM for the product. To produce a finished product, therefore, you define what subassemblies and components are needed as items in the BOM. For the subassemblies, its own BOM is created as a single-level BOM. If a subassembly has its own BOM, then the system will automatically link it internally. In addition, an

Assembly will be set for the item, which has its own BOM, as you can see in the BOM item overview.

4. Correct answers: **A, B, and E**

Allowed material types for BOM headers can be created in the customization for BOM usage in your company. When you create the BOM for the first time, the system won't assign any technical type for the BOM; it will be blank. If you create another alternative BOM, then the technical type will be **Multiple BOM**; if you create a variant BOM, the system will assign the **Variant BOM** technical type. The purpose of group BOMs is to allocate them to different plants. You can't create a BOM with "*" as a plant; system will throw an error. Pipeline materials aren't kept in stock, so you can't enter them as stock items in the BOM.

5. Correct answers: **A and D**

The default production storage location is defined in the component's material master **MRP 2** view and/or in the item details of the component in the BOM header material. The issue storage location maintained in the BOM item details will have higher priority than the material master. If the issue storage location is maintained in the BOM item, then it will be copied as the default issue storage location for the components; otherwise, the issue storage location will be copied from the material master of the component.

6. Correct answer: **B**

A client is the highest organizational self-contained unit in the SAP S/4HANA system. This can be a corporate group. The corporate group contain many company codes. Company codes represent a company within the corporate group (client).

It represents the legal unit for which a complete, self-contained chart of accounts can be created.

7. Correct answers: **B, C, and D**

A plant is the most fundamental organization unit for logistics. A plant belongs to only one company code. A company code can contain several plants. The remaining statements are correct statements.

8. Correct answers: **B and C**

An industry sector assignment is irreversible for a material master; once it's assigned, it can't be changed. It's possible to set the industry sector, views, and organizational levels as default. The material type also influences the quantity changes updates and financial value updates.

9. Correct answers: **B, C, and D**

Apart from Transaction MM01 (Create Material Masters – Immediately), the material master can also be created with transactions given in options **B, C, and D**:

- Transaction MM11: Create Material Master – Schedule
- Transaction MMCC: Material Master Copier. (With this transaction, it's possible to create, enhance, and change multiple material masters in one step. It's not possible to copy the classification data, MRP area data, or production version data, as this data is dependent on other data objects.)
- Transaction MM50: List Extendable Materials (It's possible extend material views for many materials with this transaction.)

- Transaction MM06 is for setting the deletion flag, and Transaction MMAM is for changing the material type.

10. Correct answer: **A**

Careful selection in deciding the base UoM is necessary, but if needed, it can be changed. If it's a newly created material without any dependent objects and data created, then it will be easy to change. Otherwise, various dependencies must be taken care of. If there are still dependent objects while changing the base UoM, the system will give warning/error messages. Based on that, you can address the issues.

11. Correct answer: **A**

It's possible to create 99 variants for a variant BOM with each variant having a different material number, so the answer is A. For a multiple BOM, the system will allow up to 1,000 alternatives with the same material number. However, the question is about variant BOMs, so the answer is A.

12. Correct answers: **B and C**

Phantom assemblies are imaginary in nature and are used to group materials logically. They are simple BOMs. There is no technical type "P" for BOMs. Low-level code is assigned to each material in the BOM structure and will be used during MRP. The BOM status defines which application areas use this BOM, such as MRP explosion, planned order release, and so on. The **Recursiveness Allowed** indicator should be checked if the component is the same as a higher-level assembly. Otherwise, the BOM explosion will fail due to the recursiveness check during the MRP run. The **Net ID** indicator should be selected if you use an operation scrap percentage.

13. Correct answer: **B**

With the **Work Center – Standard** value key, you can assign up to six value fields and keywords to the routing operation. Apart from setup, machine, and labor, you can also define two more keywords for electricity and water consumption, which in turn can be confirmed during the operation confirmation for an order. Answer D almost addresses the business requirement, but not fully, which can further be evaluated along with the management accounting (controlling) consultant to simplify the overall process.

14. Correct answers: **A, B, and D**

A work center can be assigned to only one cost center in a given time frame. The capacity header can be created directly in the work center **Capacities** view, or it can be created with Transaction CR11. Maintaining the factory calendar in the work center capacity header isn't mandatory. If it's not maintained, the system will adopt the plant calendar instead. Capacity with a capacity category will be used for scheduling calculations.

15. Correct answer: **A**

In the work center **Default Values** and **Costing** views, the reference indicators are available. When you set these indicators, the values can't be changed in the routing/task list. If you remove the indicator in the work center, which is used in a routing, the default values aren't copied back to the routing. If you want to maintain new default values in the routing, then either use the mass replacement function or manually changes these values in the routing. The reference indicator for **Keys of Performance Efficiency Rate** (in the standard values) will be set by the system internally.

16. Correct answer: **A**

The task list usage specifies in which area the task list can be used. So, the answer is **A**. Don't confuse the task list usage with usage of PRTs or work centers. The processing status of a work center is controlled with the **Overall** status. If you set the deletion flag, then the task list will be deleted with a deletion program.

17. Correct answers: **A, D, and E**

Interoperation time consists of queue time, wait time, and move time. Setup time, processing, and teardown time are operation execution times.

18. Correct answer: **D**

You can assign material components, trigger points, PRTs, and inspection characteristics to a routing operation.

19. Correct answers: **B, C, and D**

It's only possible to use the standard sequence in reference operation sets.

20. Correct answers: **A and D**

The standard values maintained in the suboperations are cumulated in the corresponding operation. It's not possible to assign material components, PRTs and inspection characteristics to the suboperations. You have the control in the operation to allow suboperations to be copied to the production order or not. While using suboperations, make sure that you use the appropriate control key so that costs and capacities aren't calculated twice.

21. Correct answer: **E**

With SAP S/4HANA simplifications, production version was made mandatory for in-house production. All planning objects find the BOM and routing from production versions. Because of this simplification, the sourcing logic is simpler and consistent between MRP and PP-DS.

22. Correct answers: **A, C, and D**

Phantom assemblies are imaginary in nature; they are never physically assembled and aren't planning relevant. Order reservations are created for all the components, and these components are aligned structurally to the higher assembly. To define a material as a phantom assembly, you must use special procurement type 50 (phantom assembly); if you want to use phantom assemblies only in certain cases, then you can define that in the specific higher-level BOMs. However, the phantom assembly behavior can be overwritten in the BOM item details.

2.12 Test Takeaway

This chapter is built on providing detailed information on the organizational elements and master data relevant for production planning. The focus was on providing detailed information on each master data object, customization dependencies, and relevancy to varieties of business situations. With this as a base, you must be able to explain various master-data-related options available in the SAP S/4HANA system to effectively map the business requirements to execute the business processes. You're expected to understand and analyze the possibilities and functionalities that can fit needs of the business.

2.13 Summary

In this chapter, we covered the master data objects related to production planning. The material master is a shared responsibility across the organization, but understanding some of the client-specific material master views, material types, material numbering, and various ways of handling the material masters and field level details of production planning relevant views is important for a consultant. The remaining objects such as BOM, work centers, and task lists are dependent on the material master. We discussed various types, features, and functionalities of these dependent objects. Master data is the lifeline of any organization, and a thorough understanding is vital to a smooth transactional flow and consistency in the results expected. We'll also cover master data objects in the coming chapters to understand how master data influences specific business processes. In the next chapter, we'll specifically discuss demand management.

3 Demand Management

Techniques You'll Master

- Demand management and demand planning
- Make-to-stock (MTS), make-to-order (MTO), and assemble-to-order (ATO) scenarios
- Strategies supporting the planning of components
- Different planning strategies associated with production types
- Differences between planned independent requirement (PIR) consumption and PIR reduction
- Reorganization or housekeeping of PIRs

The focus of this chapter is to explain demand planning and compare the different production methods in MTS, MTO, and ATO planning. It's important to understand how to troubleshoot and customize various planning strategies. Managing PIRs and various master data field-level information is also important during implementation situations.

Real-World Scenario

As a production planning consultant, you'll be required to understand the business of the customer, classify various products, and suggest appropriate planning strategies. You'll also set up the demand planning considering various sources of forecast that may be from other systems. The consultant should have a thorough understanding of demand management concepts

to discuss them and suggest those that suit the customer requirements.

In a manufacturing organization, different products or product groups may be classed under different production types. By asking the appropriate questions, you can find out how best the out-of-the-box SAP S/4HANA features or functionalities can be suggested and adapted to the business needs. If the demand management is implemented efficiently and effectively, then half the battle is already won during an SAP S/4HANA implementation.

If needed, the consultant should be able to undertake customization of new planning strategies by collaborating with sales and distribution consultants. This knowledge will be useful in managing support cases/issues also.

3.1 Objectives of This Portion of the Test

The objective of this portion of the certification is to test your knowledge in demand management and understanding of planning strategies with which you differentiate various production methods:

- Types of planning strategies and their differences
- Planning strategy to use in specific manufacturing environments
- Managing PIRs
- PIR consumption and reduction

- Influence of relevant fields in the material master on overall demand management.

[»] Note

The demand management topic makes up 8% of the total exam.

3.2 Consumption Process and Logic

Demand management is an important activity in an organization where the customer requirements are forecasted, reconciled, and adopted to make a meaningful demand program. An effective demand program is the backbone and key input for the production plan. It's not only a forecasting process for anticipated production to meet customer demands but also a mechanism to handle real customer demands or orders in an effective way. In the overall production program where demand quantities and dates for finished products are managed, the forecast is created and managed as a PIR. In SAP S/4HANA, the output of demand management is fed into material requirements planning (MRP).

Demand planning is a separate module in SAP Advanced Planning and Optimization and SAP Integrated Business Planning for Supply Chain (SAP IBP), and extensive functionalities are available to perform demand planning. The main aim of demand planning is to forecast the demand, which can be performed in the SAP S/4HANA system, other SAP systems, or by using any third-party tools. The forecast can be translated into PIRs in the SAP S/4HANA system.

To create a demand program, the finished products or assemblies are carefully classified and analyzed, and an appropriate planning strategy is assigned. Deciding on the planning strategy for a specific product involves deciding on the overall manufacturing philosophy of the organization, which involves how the product is planned, produced, or procured. This is where the decision of whether a product will be produced for make-to-stock (MTS), make-to-order (MTO), or any other strategy is determined.

In SAP S/4HANA, the consumption process is to compare PIRs and dates with actual customer requirements or sales orders. The consumption process is defined in the Customizing for each planning strategy.

As in [Figure 3.1](#), the consumption mode and consumption periods must be maintained in the MRP 3 view of the material master or in the customization for demand management. **Consumption mode** determines in which direction the sales orders consume the PIRs: there are four options available to select from backward, forward, or both consumption types. If the consumption mode is maintained as forward consumption, the system will consider the PIR quantity directly after the sales order in the time axis; if backward consumption, the system looks for the PIR quantity that exists before the sales order. The consumption period is maintained in workdays and is valid from the current date. Depending on the consumption mode, sales orders, dependent requirements, and material reservations will consume PIR quantities that fall within the consumption period.

The screenshot shows the SAP S/4HANA MRP 3 view for material TS422_FG100. The top navigation bar includes MRP 2, MRP 3 (selected), MRP 4, Advanced Planning, Forecasting, Work scheduling, and Plant data / stor. 1. The material details section shows Material: TS422_FG100, Descr.: Finished Product FG100, and Plant: 1010 Plant 1 SE. Below this are sections for Forecast Requirements (Period Indicator: W, Fiscal Year Variant: , Splitting Indicator:) and Planning (Strategy Group: 40, Consumption mode: 2, Fwd consumption per.: 30, Bwd consumption per.: 30, Mixed MRP: , Planning material: [empty], Planning plant: [empty], Planning matl BUUnit: [empty], Planning conv. factor: [empty]).

Figure 3.1 MRP 3 View: Consumption Mode and Consumption Periods

There are five options for consumption mode:

- Backward consumption only

- Backward/forward consumption
- Forward consumption only
- Forward/backward consumption
- Period-specific consumption (added in SAP S/4HANA; the other four options were available in SAP ERP also)

If you maintain the **Consumption mode** field but not the consumption periods, then the consumption of requirements will happen that are planned for the same day.

If you don't maintain a **Consumption mode** in the material master, the system uses the consumption parameters from the MRP group that is assigned to the material. If a consumption mode isn't specified in the MRP group also, the **Consumption mode** is set to **1** by default (backward consumption only) with a (backward) consumption period of 999 days.

[»] Note

Consumption will always happen even though the parameters aren't maintained in the material master.

In the standard SAP S/4HANA system, you must maintain the consumption mode to maintain consumption periods.

3.3 Planning Strategy

In this section, we'll provide an overview of the planning strategy and then cover different strategies for MTS production.

The planning strategy holds an appropriate procedure to plan and produce a material. This is the integration or link between the production planning and manufacturing module and sales and distribution module in SAP S/4HANA. The planning strategy is the place where the requirement types of PIRs (demand management) and the requirement types from customer requirements are combined in Customizing. [Figure 3.2](#) shows the planning strategy customization settings (Transaction OPPS) for planning **Strategy 40**.

The screenshot shows the SAP S/4HANA Planning Strategy Customization screen (OPPS) for Strategy 40. The top bar displays 'Strategy: 40 Planning with final assembly'. The main area is divided into sections:

- Requirements type of independent requirements:**
 - Reqmts type for Indep.reqmts: **VSF** *Planning with Final Assembly*
 - Reqmts class: **101** *Planning with assembly*
 - Consumption: **1** *Consume planning with assembly*
 - Planning Ind.: **1** *Net requirements planning*
- Requirements type of customer requirements:**
 - Reqmt type of customer reqmt: **KSV** *Sales Ord w. consumpt/Delivery*
 - Requirements class: **050** *SlsOrd w consu./Delv*
 - Allocation indicat.: **1** *Consume planning with assembly*
 - No MRP: *Requirement planned* *Availability check*
 - Acct Assgmt Cat: *Requirement transfer*
 - Settlement profile: *Req. Reduct.*
 - Results analysis key:
- Assembly order:**
 - Assembly type: **0** *No assembly order processing* *Online assembly:*
 - Order Type: *Capacity Check:*

Figure 3.2 Planning Strategy Customization

The requirements class of PIRs is linked to the requirement type of PIRs in Transaction OPM1; this customization node is available under **Production**.

In the customization area of sales and distribution, the requirement types of customer requirements defined in Transaction OVZG are combined with the requirement types of customer requirements in Transaction OVZH. Apart from these combinations, the planning strategy also holds the consumption indicator, availability check, assembly type and configuration, and so on.

The planning strategy must be assigned to a planning strategy group in the customization. In the planning strategy group, apart from the main strategy, it's also possible to assign up to seven alternative strategies, as shown in [Figure 3.3](#). In the standard SAP system, there are some out-of-the-box planning strategies where the main strategy and alternate strategy are also given. [Figure 3.3](#) shows planning strategy **41** where the **Main Strategy** is **40 (Planning with Final Assembly)** and the alternate **Strategy** is **20 (Make-to-order production)**. The other examples include planning strategy 31, 32, and 33.

The main strategy will be proposed during demand management or sales order processing. It's possible to change the main strategy and replace with other strategies maintained in the planning strategy group.

The planning strategy group is maintained in the material master MRP 3 view.

| | | |
|---------------------|----|--|
| Strategy Group: | 41 | Planning with final assem. with make-to-ord. |
| Planning Strategies | | |
| * Main Strategy: | 40 | Planning with final assembly |
| Strategy: | 20 | Make-to-order production |
| Strategy: | | |

Figure 3.3 Planning Strategy Group

3.4 Strategies for Make-to-Stock Production

The main aim of the MTS environment is to provide superior customer service and make the product available as and when the customer wants it. So, in anticipation of customer orders, the stock will be produced in advance; then, as and when sales orders arrive, these orders are fulfilled from the warehouse stock. It's important to have a demand plan for these kind of products to reduce inventory-carrying costs.

In the following sections, we'll discuss some of the important MTS planning strategies: net requirements planning (planning strategy 10), gross requirements planning (planning strategy 11), planning with final assembly (planning strategy 40), and production by lot size (planning strategy 30).

3.4.1 Net Requirements Planning (Planning Strategy 10)

With this strategy, only PIRs influence production or procurement, which means the main aim of following the demand plan will be achieved, and sales orders won't influence or impact the overall demand plan. Sales orders will be displayed in the stock/requirements list, but they won't be part of net requirements calculation in MRP. Because the sales orders aren't relevant for MRP, the consumption of PIRs won't take place in this strategy. The oldest PIRs will be reduced by goods issue for the sales order delivery. This planning strategy is useful in mass production environments and is often combined with repetitive manufacturing.

This strategy is useful for products with seasonal demand where production needs to be smoothed. It uses the following requirement

types:

- For independent requirements: LSF
- For customer requirements: KSL

As shown in [Figure 3.4](#), for net requirements planning, the MRP element IndReq has LSF as its requirements type. Even though there is a customer order, it's only for informational purpose.

| Date | MRP e... | MRP element data | Rescheduling... | ... Receipts/Requer... | Available Qty | Prev. Stor... |
|------------|----------|------------------|-----------------|------------------------|---------------|---------------|
| 21.01.2021 | Stock | | | | 0 | |
| 01.01.2021 | IndReq | LSF | | | 100- | 100- |
| 22.01.2021 | PltOrd | 0000000552/STOCK | 01.01.2021 | 20 | 100 | 0 0001 171A |
| 01.02.2021 | PltOrd | 0000000553/STOCK | | | 100 | 100 0001 171A |
| 01.02.2021 | IndReq | LSF | | | 100- | 0 |
| 01.03.2021 | PltOrd | 0000000554/STOCK | | | 100 | 100 0001 171A |
| 01.03.2021 | IndReq | LSF | | | 100- | 0 |
| 01.04.2021 | PltOrd | 0000000555/STOCK | | | 100 | 100 0001 171A |
| 01.04.2021 | IndReq | LSF | | | 100- | 0 |

Figure 3.4 Stock/Requirements List: Net Requirements Planning

[!] Warning

For this strategy, the oldest PIRs are reduced first, and consumption mode isn't relevant. However, if the sale from stock exceeds the total PIR quantity in the past because of unplanned sales orders, then PIRs in the future are reduced if a corresponding entry is maintained in the consumption period.

3.4.2 Gross Requirements Planning (Planning Strategy 11)

For this strategy, there are many similarities with planning strategy 10 (net requirements planning). The main difference is that on-hand stock isn't considered during MRP, which means only planned quantities are produced. This strategy is mainly used where it's not possible to stop production even though the stock is available. This

strategy is useful in cement, steel, or pig iron-making industries, where continuous production occurs, and shutdown of production isn't an option to optimize planning.

One additional master data parameter to be maintained for this planning strategy is setting the **Mixed MRP** field to **2 (gross requirements planning)** in the **MRP 3** view (refer to [Figure 3.1](#)). As in planning strategy 10, sales orders also won't have any influence on planning for this strategy, so there's no consumption of PIRs. Reduction of PIRs takes place during goods issue for production orders, planned orders (repetitive manufacturing), or purchase orders (trading goods). As shown in [Figure 3.5](#), there is a special segment in the stock/requirements list, **Gross Requirements Planning**, for all the relevant PIRs and procurement elements.

This strategy uses the following requirement types:

- For independent requirements: BSF
- For customer requirements: KSL

As shown in [Figure 3.5](#), for gross requirements planning, the **MRP element IndReq** has **BSF** as its requirements type. Even though a stock of 300 PC is available, the system planned for an additional 300 PC to fulfill PIRs.

| | Date | MRP e... | MRP element data | Rescheduling... | E... | ReceiptRequest | Available Qty | P... Planned Qty | St... Stock | Page | 1 / 1 |
|--|------------|----------|-------------------------|-----------------|------|----------------|---------------|---------------------|----------------|------|-------|
| | 21.01.2021 | Stock | | | | | 75- | 0 | | | |
| | 20.01.2021 | Cusd# | 0000000133/0000010/0001 | | | | 75- | 75- | | | |
| | 21.01.2021 |> | Gross Requirements plan | | | | | | | | |
| | 01.01.2021 | IndReq | ESF | | | | 100- | 100- | | | |
| | 22.01.2021 | PoOrd | 0000000558/SMOK | 01.02.2021 | 20 | | 100 | 0 | 0002 171A | | |
| | 01.02.2021 | PoOrd | 0000000557/SMOK | | | | 100 | 100 | 0002 171A | | |
| | 01.02.2021 | IndReq | ESF | | | | 100- | 0 | | | |
| | 01.03.2021 | PoOrd | 0000000558/SMOK | | | | 100 | 100 | 0002 171A | | |
| | 01.03.2021 | IndReq | ESF | | | | 100- | 0 | | | |
| | 01.04.2021 | PoOrd | 0000000559/SMOK | | | | 100 | 300 | 0002 171A | | |
| | 01.04.2021 | IndReq | ESF | | | | 100- | 0 | | | |

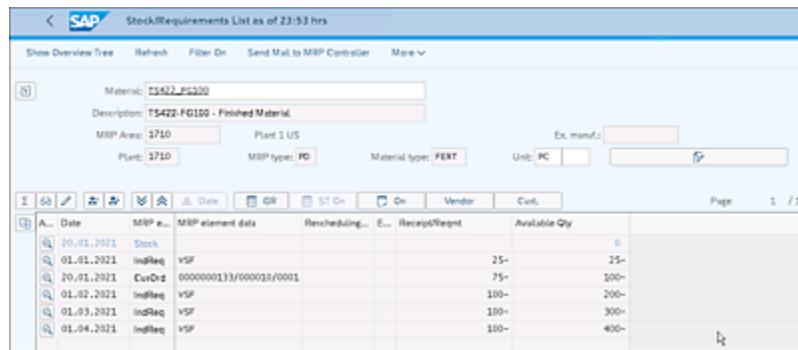
Figure 3.5 Stock/Requirements List: Gross Requirements Planning

3.4.3 Planning with Final Assembly (Planning Strategy 40)

Planning strategy 40 is the most widely used planning strategy. This strategy combines the features of both MTS and MTO strategies, where sales orders will have influence on planning. In this strategy, MRP will generate planned orders to cover the PIRs if existing stock or planned receipts don't cover the PIRs. MRP will also consider sales orders if they exceed the PIR quantity, meaning the maximum from sales orders or PIRs will always be planning relevant.

Incoming sales orders consume PIRs so that the planning situation is always adjusted to suit the current requirements and to avoid duplicate manufacturing. This consumption of PIRs is based on the parameters either maintained in the material master or from the parameters maintained in the customization of the MRP group. With this strategy, it's possible to react quickly to customer requirements.

In [Figure 3.6](#), the PIRs were maintained at 100 PC each on a monthly bucket from January to April. The incoming sales order consumed the PIR quantity, and the remaining PIR for the month of January is only 25 PC.



The screenshot shows the SAP Stock Requirements List interface. At the top, there are buttons for Show Overview Tree, Refresh, Filter On, Send Mail to MRP Controller, and More. Below this, a search bar shows 'Material: T5422-PC100' and a description 'T5422-FG100 - Finished Material'. It also displays MRP Area: 2710, Plant: 2710, MRP type: PD, Material type: FERT, Unit: PC, and Ex. manuf.: [empty]. The main table lists requirements for January 2021:

| A. | Date | MRP e... | MRP element data | Rescheduling... | E... | ReceiptWeight | Available Qty | Planned Qty |
|----|------------|----------|-------------------------|-----------------|------|---------------|---------------|-------------|
| | 20.01.2021 | Stock | | | | | 0 | 0 |
| | 01.01.2021 | IndReq | VSK | | | | 25- | 25- |
| | 01.01.2021 | CInvD | 0000000133/0000038/0001 | | | | 75- | 100- |
| | 01.02.2021 | IndReq | VSK | | | | 100- | 200- |
| | 01.03.2021 | IndReq | VSK | | | | 100- | 300- |
| | 01.04.2021 | IndReq | VSK | | | | 100- | 400- |

Figure 3.6 Stock Requirements List: Planning with Final Assembly

This strategy uses the following requirement types:

- For independent requirements: VSK (planning with final assembly)

- For customer requirements: KSV (sales order with consumption)

[»] Note

It's not required to have **Availability check** selected in the material master field in the **MRP 3** view while using this strategy, as this field won't impact the planning process of strategy 40.

3.4.4 Production by Lot Size (Planning Strategy 30)

Planning by lot size is only based on sales orders or sales scheduling agreements. Several sales orders can be grouped together for production collectively in a single lot. This can be achieved by lot size optimization or the rounding mechanism. As the production is purely based on sales orders, it will be challenging to anticipate the production volumes and the component requirements. Therefore, procurement of components can be performed by using planning strategy 70 (kanban components or consumption-based components). In some situations, or during production optimization, it's better to produce to a lot size, for example, for foundry operations or steel melting, where it's always economical to produce to full furnace capacity. This planning strategy is used where the production is for major customers, and the leftover stock will be sold in smaller quantities.

With this strategy, there is no need for PIRs because sales orders or schedule lines will be consumed by the deliveries. If any goods issue is made against a specific sales order, then the sales order quantity will be reduced by the system.

This strategy uses the following requirement types:

- For independent requirements: LSF (MTS production)

- For customer requirements: KL (sales order manufactured by lot size)

3.5 Strategies for Make-to-Order Production

If planning the finished product isn't possible or isn't required and based on only a specific customer requirement when the production is carried out, then this production method is MTO production. MTO production only starts when a sales order is received. Subsequently, in this section, we'll cover the MTO production (planning strategy 20), planning without final assembly (planning strategy 50), and planning with planning material (planning strategy 60) strategies.

3.5.1 Make-to-Order Production (Planning Strategy 20)

Production or procurement will only be initiated after receiving the sales order. The existing stock for the finished product won't be considered during planning. Each sales order is planned separately in an individual segment. As shown in [Figure 3.7](#), these stock segments are created automatically when a sales order is created. Products of high value or unique nature can be produced with this production type. This strategy is used when it's hard to predict or forecast the final product. There are no PIRs involved or needed for the finished product, but to reduce the overall lead times, components can be planned with appropriate strategies separately. The sales order quantity and the requirements will be reduced with the goods issue to the order. In the MTO production, sales orders and receipts (planned orders and then production orders) are linked; that is, they have fixed pegging. When the goods receipt to production order is posted, it will be posted to the like sales order and line item's special stock. The production quantities can't be exchanged between the sales orders.

Starting from the sales order at the finished product level, the MTO production can extend to as many levels of the bill of materials (BOM) as needed. This can be achieved by maintaining the **Individual/Coll.** field in the material master **MRP 4** tab as **1-Individual Requirements Only**. It will be planned under sales order special stock.

This strategy uses the following requirement types:

- Requirements type for independent requirements: blank
- Requirements type for customer requirements: KE (individual sales order without consumption)

The screenshot shows the SAP Stock Requirements List (MTO Production) for material T5427-FG150. The top header includes fields for Material (T5427-FG150), Description (T5427-FG150 - Finished Material), MRP Area (1710), Plant (1 US), Ex. manuf. (blank), and Unit (PC). The MRP type is PD. The Material type is FERT. The table below lists requirements with columns for Date, MRP E., MRP element data, Rescheduling, Receipt/Reqmt, Available Qty, Prep., and Start. The data shows several entries for January 2023, mostly for Stock requirements (CustDr), with some for Planned Requirements (PlaDr).

| | Date | MRP E. | MRP element data | Rescheduling | E... Receipt/Reqmt | Available Qty | Prep... | Start... |
|--|------------|--------|-------------------------|--------------|--------------------|---------------|-------------|----------|
| | 21.01.2023 | Stock | 0000000142/0000010 | | | 0 | | |
| | 21.01.2023 | CustDr | 0000000142/0000010/0001 | | | 0 | | |
| | 22.01.2023 | PlaDr | 0000000958/50 | | | 85- | 85- | |
| | 21.01.2023 | CustDr | 0000000143/0000010 | | | 0 | | |
| | 21.01.2023 | CustDr | 0000000143/0000010/0001 | | | 75- | 75- | |
| | 22.01.2023 | PlaDr | 0000000956/50 | | | 75 | 0 0001 171A | |
| | 21.01.2023 | CustDr | 0000000144/0000010 | | | 0 | | |
| | 21.01.2023 | CustDr | 0000000144/0000010/0001 | | | 150- | 150- | |
| | 22.01.2023 | PlaDr | 0000000957/50 | | | 150 | 0 0001 171A | |

Figure 3.7 Stock Requirements List: MTO Production

3.5.2 Planning without Final Assembly (Planning Strategy 50)

Planning with planning material is one of the most widely used planning strategies in MTO scenarios. The main aim of this planning strategy is to allow planning of components and delay the final assembly until the receipt of the sales order. In this strategy, with reference to the PIRs entered for the finished product, the system creates planned orders of order type VP, which are nonconvertible; they are relevant for production only after the receipt of the sales order. We'll see a special planning segment called **Preplanning** in the stock/requirements list for these planned orders. This type of

planned order is created so that the BOM can be exploded, and the dependent requirements are passed on to the components.

The assemblies or components are produced or procured and placed in stock well before the sales order for the final product is entered. Final assembly is triggered after the sales order has been received. The incoming sales order consumes the PIRs, which reduces the nonconvertible planned order quantity.

In this strategy, an availability check is performed only based on PIRs. A finished product is considered available if an unconsumed PIR is available for that material. The **ATP Check** indicator in the material master isn't relevant because the availability checks according to available-to-promise (ATP) logic doesn't take place.

This strategy uses the following requirement types:

- For independent requirements: VSE (planning without final assembly)
- For customer requirements: KEV (MTO with consumption)

3.5.3 Planning with Planning Material (Planning Strategy 60)

Usage of the strategy planning with planning material is justified if one or more of the components are shared between many finished products and similarities in the manufacturing process. In this strategy, all the common parts are grouped together under a planning material. This planning material is never produced, but it will pass on the dependent requirements from the finished product to the components belonging to the planning material.

As shown in the [Figure 3.8](#), both the finished product and the planning material should have the planning **Strategy Group** maintained as **60**. The finished product should contain the **Planning**

Material, Planning Plant, and Plng conv. factor (planning conversion factor) maintained. In the planning material, the appropriate consumption parameters should be maintained.

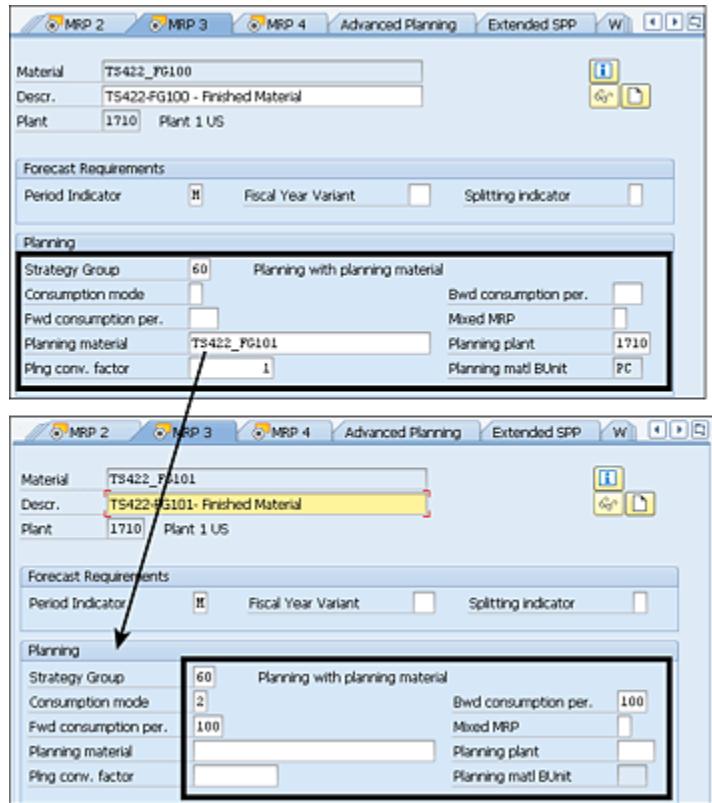


Figure 3.8 Material Mater Settings for Both the Finished Material and the Planning Material

In this strategy, PIRs are created for planning material. Planned orders of type VP are created in the subsequent planning run, and the dependent requirements are passed on to the components for the early procurement and to reduce the overall lead time for production or procurement purposes. The VP planned orders are nonconvertible or can't be changed manually. As shown in

Figure 3.9, when the sales orders are received for the finished product, the planning material PIRs will be consumed.

| Date | MRP e... | MRP element data | Rescheduling... | E... | Receipts/Requ... | Available Qty | Pro... | Stor... |
|------------|---------------------------------|----------------------------|-----------------|------|------------------|---------------|--------|---------|
| 21.01.2021 | Stock | CustOrd 0000000141/0000010 | | | | 85- | 85- | |
| 21.01.2021 | CustOrd 0000000141/0000010/0001 | | | | | | | |
| 29.01.2021 | | | | | | 85- | | |
| 22.01.2021 | PlnOrd 0000000560/50 | | | | | 85 | 0001 | 171A |

| Date | MRP e... | MRP element data | Rescheduling... | E... | Receipts/Requ... | Available Qty | Pro... | Stor... |
|------------|-------------------------------|------------------|-----------------|------|------------------|---------------|--------|-----------|
| 21.01.2021 | Stock | | | | | 0 | | |
| 21.01.2021 | -----> PrepTanning w/o Assemb | | | | | | | |
| 01.01.2021 | PlnOrd 0000000561/INDR | | | | | 15 | 15 | 0001 171A |
| 01.01.2021 | IndReq VSEV | | | | | 15- | 0 | |
| 01.02.2021 | PlnOrd 0000000562/INDR | | | | | 100 | 100 | 0001 171A |
| 01.02.2021 | IndReq VSEV | | | | | 100- | 0 | |
| 01.03.2021 | PlnOrd 0000000563/INDR | | | | | 100 | 100 | 0001 171A |
| 01.03.2021 | IndReq VSEV | | | | | 100- | 0 | |
| 01.04.2021 | PlnOrd 0000000564/INDR | | | | | 100 | 100 | 0001 171A |
| 01.04.2021 | IndReq VSEV | | | | | 100- | 0 | |

Figure 3.9 Stock Requirements List: Planning with Planning Material

This strategy is like planning strategy 63 (planning with a planning material and without MTO). The only difference is that the planned order type will be MTO in the scenario. It uses the following requirement types:

- For independent requirements: VSEV (planning the planning material)
- For customer requirements: KEVV (individual customer with planning material consumption)

3.6 Planning for Components

The main purpose of planning for components is to produce or procure the components well in advance so that the overall lead time can be reduced or customer requirements can be reacted to quickly.

In SAP S/4HANA, various planning strategies are available for planning for components, planning at the assembly level (strategy 70), planning at the phantom assembly level (strategy 59), and planning without final assembly at the assembly level (strategy 74). Planning at the assembly level is the most commonly and widely used strategy, so we'll focus on that in this section.

All these strategies can be used in MTS and MTO environments. If you want to make use of a strategy for an MTS planning of components in an MTO environment, maintain the **Individual/coll.** indicator (**MRP 4** screen) as **2**.

Planning strategy 70 is one of the most widely used planning strategies for planning for components. This strategy can be used when the component can be more reliably planned than the finished product. Even though this strategy can be used in all manufacturing environments, it's predominantly combined with MTO or ATO environments so that the needed components' availability can be ensured beforehand and customer demand can be quickly reacted to.

The material master setup for this strategy is shown in [Figure 3.10](#). Maintain the material master with planning **Strategy Group** as **70**

**(Planning with final assembly) and the Mixed MRP field set to 1
Subassembly planning with final assembly.**

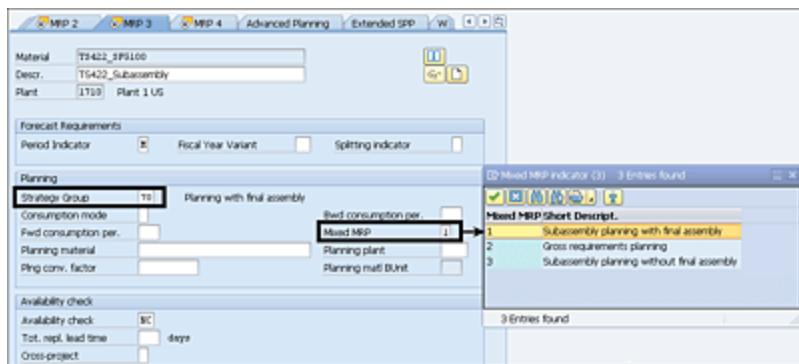


Figure 3.10 Planning at the Assembly Level: Material Master Setup

This strategy is like planning strategy 40 (planning with final assembly). In this strategy, PIRs are created for the components. The dependent requirements or order reservations from the finished products will consume the PIRs of the components.

[+] Tip

This strategy can be used for both semifinished materials and raw materials, which means the material can be produced in-house or procured externally.

3.7 Assemble-to-Order Production

ATO production is a special type of MTO production where the main components are produced or procured well in advance, and the final assembly step will commence only after the receipt of the sales order for finished product. This strategy was pioneered by the computer manufacturing industry and then proliferated into many other industries.

As shown in [Figure 3.11](#), various planning strategies are available for ATO in SAP S/4HANA, but the most widely used planning strategy is assembly processing with production orders (strategy 82).

| Strategy | Planning strategy description | Reqs-DM | Reqs-Cu. |
|----------|--|---------|----------|
| 81 | Assembly processing with planned orders | | KMSE |
| 82 | Assembly processing w. production orders | | KMFA |
| 83 | Assembly processing with networks | | KMNP |
| 84 | Service orders | | SERA |
| 85 | Assembly processing with network/project | | KMPN |
| 86 | Filling with process orders "Assembly" | | KMPA |
| 89 | Assembly proc. w. characteristics plng | VSE | KMSE |

Figure 3.11 ATO Planning Strategies (Transaction OPPS)

With planning strategy 82, when a sales order is created, a production order will be created automatically, creating a 1:1 link between sales order and production order. Because of the link, if there is any change in sales order quantities, it will immediately reflect in the production order also.

In the SAP S/4HANA system, production order type PP04 is predefined for assembly with production orders and is assigned in **Reqmts class** (requirements class) **201**, as shown in [Figure 3.12](#).

| | | | |
|--------------------|-------------------------------------|--------------------|-------------------------------------|
| Reqmts class: | 201 | Assembly: | prod.order |
| Requirements | | Assembly | |
| Avail. Check: | <input checked="" type="checkbox"/> | Assembly type: | 2 |
| Req. transfer: | <input checked="" type="checkbox"/> | Order costing: | <input type="checkbox"/> |
| Allocation Ind.: | <input type="checkbox"/> | Automatic pinning: | <input type="checkbox"/> |
| Prod.allocation: | <input type="checkbox"/> | Special Stock: | E |
| Ind.req.reductn: | <input type="checkbox"/> | Order Type: | PP04 |
| No MRP: | <input type="checkbox"/> | Avail.components: | <input checked="" type="checkbox"/> |
| Configuration | | Type comp.check: | <input type="checkbox"/> |
| Configuration: | <input type="checkbox"/> | Online assembly: | 3 |
| Cons.of config.: | <input type="checkbox"/> | Capacity check: | <input type="checkbox"/> |
| Costing | | No update: | <input type="checkbox"/> |
| Costing: | <input type="checkbox"/> | OCM: | <input type="checkbox"/> |
| Account assignment | | | |
| Costing: | <input type="checkbox"/> | Acct Assgmt Cat: | M |
| | | Valuation: | M |

Figure 3.12 Requirements Class 201: For Assembly with Production Order

3.8 Creation of Demand Plan

Forecasting is the first step in the production planning flow. S&OP (available in SAP S/4HANA or SAP IBP) or any other tool is used to create the forecast. The forecast can be fed in the SAP S/4HANA system via demand management, which produces PIRs as output. The PIRs can be created by various means—manually entering the quantities, copying from PIRs of other materials, copying the results of S&OP, and so on—so the precursor activity to MRP is the creation of a demand plan that can span many periods.

The demand plan can be created by using the SAP GUI Transaction MD61. With SAP S/4HANA 1909 on, there is an SAP Fiori app called Maintain PIRs, as shown in [Figure 3.13](#).



Figure 3.13 Maintain PIRs App

This is a simplified app in comparison to SAP GUI Transaction MD61. As shown in [Figure 3.14](#), Maintain PIRs shows various key figures, such as **Accuracy - Current Period**, **Accuracy -Last Week**, **Accuracy - Last Month**, and so on. The accuracy is

measured in percentage of PIRs consumed/reduced by an actual demand.

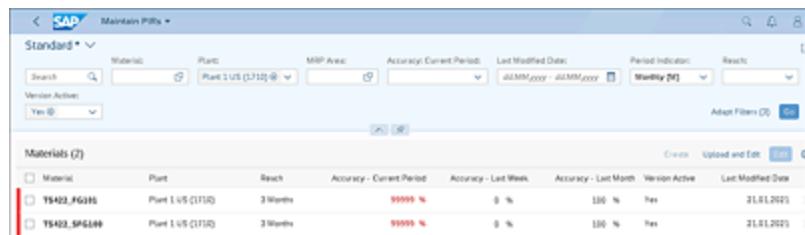


Figure 3.14 Maintain PIRs App: Key Figures

The PIRs can be uploaded or edited with this app. The upload functionality isn't available in SAP ERP. With this app , PIRs of up to 50 materials maximum can be created, monitored, or mass-maintained at a time either in months or weeks for up to 12 months or 52 weeks.

[»] Note

If more than 50 materials are selected in the initial screen, the system displays a dialog box informing that it has limited the selected materials to 50.

Other SAP Fiori apps are also available, including Schedule Copying of Total Forecast Runs, Analyze PIR Quality, and Schedule PIR Reorganization Runs.

Forecasts are rarely accurate, which means many PIRs will still be available that aren't reduced by actual sales orders. It's a best practice to clean out PIRs by executing reorganization runs periodically via scheduled periodic background jobs. With the Schedule PIR Reorganizing Runs app, PIR reorganization runs can be performed as background jobs. This app offers three job templates, as shown in [Figure 3.15](#):

- **PIR Reorganizing - Adjusting Requirements**

The quantities of all the selected PIRs will be matched with requirements. If there is no requirement to consume the PIR, then the PIR quantity will be set to zero.

- **PIR Reorganizing - Delete History and PIRs**

The history and header of the PIR will be deleted (if there are no PIRs).

- **PIR Reorganizing - Delete Old PIR Records**

All the PIRs with zero quantity will be deleted.



Figure 3.15 PIR Reorganization Run: Job Templates

SAP GUI Transactions MD74, MD75, and MD76 are available for PIR reorganization. SAP Note 135807 provides good generic information on the PIR reorganization.

3.9 Important Terminology

In this chapter, the following terminology was used:

- **Exception message**

Exception messages indicate the exception situations as part of the results of an MRP run.

- **Individual/Coll. indicator**

The requirements quantities of the dependent materials are stated individually or grouped together, or both can be determined with this setting

- **Mixed MRP indicator**

The **Mixed MRP** indicator is used in conjunction with some of the planning strategies and is used only in case of gross requirements planning and subassembly planning:

- Mixed MRP 1: Subassembly planning with final assembly – Planning strategy 70, 59 (Planning at Phantom Assembly Level)
- Mixed MRP 2: Gross requirements planning – Planning strategy 11
- Mixed MRP 3: Subassembly planning without final assembly – Planning strategy 74

- **MRP group**

The **MRP Group** groups material from the MRP point of view to allocate them control parameters for planning. The control parameters include the strategy group, the planning horizon, and the creation indicator for the planning run. For overall planning, the creation indicator parameters maintained in the MRP group will be prioritized over the creation indicator in the overall planning

initial screen. **MRP group** is maintained in the **MRP 1** view of the material master.

- **MRP list**

This list shows the static planning situation of a material or group of materials, and the list is generated after completion of the planning run. This is only created for classic MRP.

- **PIR consumption and PIR reduction and PIR reduction**

For planning strategy 40 (planning with final assembly), the incoming sales orders consume the PIRs, which is an example of consumption. PIRs are reduced at goods issue for delivery. For planning strategy 10 (net requirements planning), where sales orders don't have any influence, the oldest PIR is reduced first, which is an example of reduction. The consumption settings are maintained in Transaction OMPO (Maintaining Requirements Classes for PIRs). The PIR reduction is maintained in Transaction OMJJ.

- **Planning strategy**

The planning strategy represents a planning procedure for planning a material.

- **Stock requirements list**

This is a dynamic list that shows the current status of requirements of a material.

- **Total replenishment lead time**

The total replenishment lead time is the time needed to have all the BOM components available considering in-house production time and/or planned delivery time of externally procured components of the longest production path.

3.10 Practice Questions

These questions will help you evaluate your understanding of the topics covered in this chapter. They are similar in nature to those on the certification examination. Although none of these questions will be found in the exam itself, they will allow you to review your knowledge of the subject. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers and only correct answers to receive credit for the question.

1. Which of the following planning strategies are make-to-stock (MTS) strategies? (There are three correct answers.)
 - A. Production by lot size
 - B. Planning with final assembly
 - C. Planning at assembly level
 - D. Planning without final assembly
2. Which indicator in the material master record determines whether a component is procured for a specific sales order stock?
 - A. Availability check of the finished product
 - B. MRP type of components
 - C. Individual/coll. requirement of the component
 - D. Mixed MRP indicator of the finished product
3. The production is based on the forecast for finished product, and the stock is expected to be available in inventory before the customer order. You want to quickly react to the customer requirement by increasing the production. Which planning strategy should be selected?

- A.** Planning strategy 50: Planning without final assembly
 - B.** Planning strategy 20: Make-to-order production
 - C.** Planning strategy 40: Planning with final assembly
 - D.** Planning strategy 70: Planning at assembly level
4. A material is planned with planning strategy 70 (planning at assembly level). The consumption mode maintained was backward with a consumption period of 30 days. Starting from when are the 30 days counted backwards? (There are two correct answers.)
- A.** From the scheduled line date in the case of repetitive manufacturing
 - B.** From the dependent requirement date of the material
 - C.** From the sales order requirement date of finished product
 - D.** Goods issue date for the production order
5. The **Mixed MRP** indicator is used in conjunction with which of the planning strategies? (There are two correct answers.)
- A.** Net requirements planning
 - B.** Gross requirements planning
 - C.** MTO planning
 - D.** Subassembly planning strategies
6. The stock/requirements list for a material using which MTS strategy shows the special stock segment?
- A.** Net requirements planning: Strategy 10
 - B.** Gross requirements planning: Strategy 11
 - C.** Production by lot size: Strategy 30
 - D.** Planning without final assembly and without MTO: Strategy 52

7. With reference to MTO planning strategies, which of the following statements are correct?
- A.** MTO strategies should always be combined with lot-size key EX (lot-for-lot).
 - B.** Rounding values should not be used.
 - C.** Only answer A is correct.
 - D.** Both A and B are correct.
8. True or False: In anonymous MTS production, the oldest planned independent requirement (PIR) is reduced first.
- A.** True
 - B.** False
9. For planning strategy 40 (planning with final assembly) , if you don't maintain the consumption parameters, what happens to the PIRs? (There are two correct answers.)
- A.** The customer requirements won't consume PIRs.
 - B.** The customer requirements will consume the PIRs first in the past and then switch to future.
 - C.** If no consumption parameters are maintained, the system will check the consumption parameters in the MRP group assigned to the material.
 - D.** If no consumption parameters are maintained, then the default setting is backwards consumption for 999 days.
10. A configurable material is a material for which different variants are possible. Identify all the planning strategies for configurable materials. (There are multiple correct answers.)
- A.** Planning variants with a planning material (Strategy 65)
 - B.** MTO production with configuration (Strategy 25)
 - C.** Planning variants without final assembly (Strategy 55)

- D.** MTO production for material variants (Strategy 26)
11. In the stock requirements list, planned orders created within the **Preplanning** segment have a special type VP. Which planning strategies are associated with this special planned order type VP? (There are multiple correct answers.)
- A.** Planning without final assembly (Strategy 50)
 - B.** Planning without Final Assembly and without MTO (Strategy 52)
 - C.** Planning with a planning material (Strategy 60)
 - D.** Planning with a planning material and without MTO (Strategy 63)
12. True or False: PIR reorganization will clear all the PIRs.
- A.** True
 - B.** False

3.11 Practice Answers and Explanations

1. Correct answers: **A, B, and C**

Option D, planning without final assembly (50) is an MTO strategy. The remaining strategies are MTS strategies

2. Correct answer: **C**

The **Individual/coll.** indicator in the **MRP 4** view controls how the dependent requirements are managed in individual segments specific to a sales order produced/procured collectively or planned in the same way as in the higher-level assembly.

3. Correct answer: **C**

These are the characteristics of planning strategy 40 (planning with final assembly). As indicated in the question, the production is based on a forecast of the finished product, so answers A, C, and D are incorrect.

4. Correct answers: **A and B**

For planning strategy 70 (planning at assembly level), PIRs are consumed by production order or planned order requirements or schedule lines in repetitive manufacturing and not by requirements of sales orders.

5. Correct answers: **B and D**

The **Mixed MRP** indicator is only used for subassembly planning strategies such as planning strategy 11 (gross requirements planning), 59 (planning at phantom assembly)

level), 70 (planning at assembly level), and 74 (planning without final assembly at assembly level).

6. Correct answer: **B**

Strategy 11 (gross requirements planning) is the only MTS planning strategy that will have a special segment in the stock/requirements list, which is used for planning purposes only. If the **Mixed MRP** indicator in the **MRP 3** view isn't maintained, then it won't be possible to maintain PIRs in Transaction MD61, as the requirements type BSF needs this indicator to be maintained.

7. Correct answer: **D**

The master data to be maintained for all the MTO strategies discussed in the question relates to MTO production (strategy 20) , planning without final assembly (strategy 50) , and planning with planning material (strategy 60) . The lot-size key maintained should always be EX (lot-for-lot), and rounding values should not be used. Even if you maintain other lot-size keys or rounding values, these values don't take effect in MTO strategies.

8. Correct answer: **A**

In anonymous MTS production, the oldest (first in, first out [FIFO]) PIR is reduced first. If there are no PIRs left in the past, then the PIRs in the future will also get reduced, if reduction is permitted. The settings for reduction are maintained in Transaction OMJJ. During assembly planning, the PIRs are reduced when goods are issued for the production order.

9. Correct answers: **C and D**

If you don't maintain a consumption mode in the material master, the system uses the consumption parameters from the MRP group that is assigned to the material. If a consumption mode isn't specified in the MRP group also, the **Consumption mode** is set to **1** by default (backward consumption only) with a (backward) consumption period of 999 days.

10. Correct answers: **A, B, C, and D**

All the given options are correct for planning strategies for configurable materials. With these strategies, it's possible to plan almost an unlimited number of combinations of characteristics and combination value keys.

11. Correct answers: **A, B, C, and D**

All the options given are correct. In the stock requirements list, planned orders created within the **Preplanning** segment have a special type VP. They are created so that the BOM can be exploded, and dependent requirements can be passed to the components. These planned orders with order type VP aren't convertible or manually changeable, and they will be used only to pass the demand to the components.

12. Correct answer: **B**

It's a best practice to periodically run PIR reorganization to clear out old PIRs that weren't reduced by actual sales orders. PIR reorganization is executed in three different steps with these transactions and programs: Transaction MD74 (program RM60RR20), Transaction MD75 (program RM60RR30), and Transaction MD76 (program RM60RR40). In SAP S/4HANA, for this purpose, there is also an SAP Fiori app called PIR Reorganization Run.

3.12 Test Takeaway

You've gained good knowledge in this chapter about demand management and demand planning, different production types, and associated planning strategies, including how the requirement types for PIRs and customer requirements interact and together form the basis for planning strategy customization. Although it's possible to create new planning strategies, care should be taken and existing options should be evaluated first. With decades of experience, SAP has already incorporated many planning strategies out of the box in SAP S/4HANA, considering most of the business scenarios in view. Managing PIRs in SAP Fiori apps and reorganizing them is an important activity. SAP has listened to the industry and provided the ability to upload PIRs with SAP Fiori apps.

As you start gaining experience with various planning strategies, by looking into stock/requirements of a material, you can quickly identify what kind of planning situation a material is undergoing and if there are any issues you can quickly troubleshoot.

You should be familiar with and have a good understanding of the material master fields that are important for demand management. Consider this chapter as the heart of production planning and manufacturing. A support or implementation consultant with thorough knowledge of the concepts discussed in this chapter will provide a good value to SAP S/4HANA implementation projects.

3.13 Summary

Demand management is the fundamental building block required for effective implementation of the SAP S/4HANA solution in a customer environment. By now, you must have internalized different production types and associated planning strategies and how the standard SAP S/4HANA system supports many business scenarios.

In the next chapter, we'll discuss MRP in detail, including the major improvements and innovations implemented in SAP S/4HANA.

4 Material Requirements Planning

Techniques You'll Master

- Material requirements planning (MRP) overview and MRP procedures
- Master data parameters relevant for MRP
- Planning runs with classic MRP and MRP Live
- Simplifications in MRP with SAP S/4HANA
- MRP parameters configuration
- Evaluating MRP results with SAP Fiori apps

The focus of this chapter is to explain material requirement planning (MRP) in SAP S/4HANA. In comparison to SAP ERP, many simplifications were introduced with SAP S/4HANA, so it's important for you to understand them in detail. As we progress with this chapter, these topics will be introduced.

Tremendous improvements in MRP were added starting with SAP S/4HANA release 1511, which is when SAP S/4HANA simple logistics were introduced, and each subsequent release of SAP S/4HANA added new topics and enhanced existing topics. The basic concepts around MRP are predominantly the same with a few new additions, including demand-driven MRP and predictive material and resource planning (pMRP), which we'll cover in [Chapter 9](#). For this chapter, the focus will be on MRP procedures, planning process, master data that supports the planning process, critical differences

between classic MRP and MRP Live, and evaluation of MRP results with various SAP Fiori apps.

Real-World Scenario

MRP is the core component of SAP S/4HANA, and many organizations are implementing MRP Live or migrating traditional MRP capabilities to run on SAP HANA. MRP Live opens the door for many capabilities offered by SAP S/4HANA. As a consultant or planner, it's important to understand the core capabilities and process steps of MRP, the simplifications made, and the fundamental changes in the SAP HANA platform that enable making "One MRP" a reality. Most importantly, the enhanced capabilities for evaluating MRP results, KPI monitoring, and decision-making capabilities available in the new platform are inspiring confidence and adoption in the industry. The main function of MRP is to ensure material availability; this requires understanding the requirements holistically, as well as configuring and implementing planning functionalities, which are skills that are always in demand and expected from consultants.

4.1 Objectives of This Portion of the Test

The purpose of this portion of the certification exam is to test your knowledge in material requirements planning (MRP), the especially consumption-based planning with SAP S/4HANA. For the certification, you need to have a good understanding of the following topics:

- Process steps in MRP
- Various master data parameters that influence the MRP results

- “One MRP” capabilities and various tools available for evaluation
- Carrying out planning runs with classic MRP and MRP Live
- Business challenges, capabilities, and business benefits with MRP Live on SAP HANA

[»] Note

The MRP in SAP S/4HANA topic makes up 8%–12% of the total exam.

4.2 Material Requirements Planning Procedures

MRP has been used in the manufacturing industry for more than 60 years. The MRP concept has grown larger into MRP II and enterprise resource planning (ERP) by including other organization areas such as materials management, sales and distribution, and finance. In SAP ERP also, MRP has been the central component from its initial releases.

With the release of SAP S/4HANA 1511, major innovations were included around MRP, especially the improved performance in the execution of MRP runs by completely rewriting MRP to suit the SAP HANA database. This improved MRP is called *MRP Live*. The previous MRP offering and the transactions in SAP ERP are now called *classic MRP*. There is no change in the business logic between classic MRP and MRP Live.

Classic MRP was written in the ABAP language (the same language used to develop SAP ERP), and the business logic is written such that the code is executed in the application layer by fetching the data sequentially from the database, and the process continues for each and every planning element. The MRP run is a performance-intensive process that is usually executed in the background and takes a long time. But with MRP Live, the MRP logic and the algorithms were written directly in the SAP HANA database in SQL. The execution of business logic, calculations, aggregation of data, and so on are performed in the SAP HANA database itself. This drastically reduces the data traffic between the database and the application layer, substantially improving the performance of MRP runs.

The aim of MRP is to guarantee the material availability as and when needed. To achieve this, the first thing is to assign an MRP type to the material master. The MRP type determines which MRP procedure to use to execute MRP. In the next sections, more details about MRP types will be covered as part of master data.

The SAP S/4HANA system is delivered with many MRP procedures, as shown in [Figure 4.1](#). MRP procedures are an integral part of MRP type definition, and you can't create new MRP procedures.

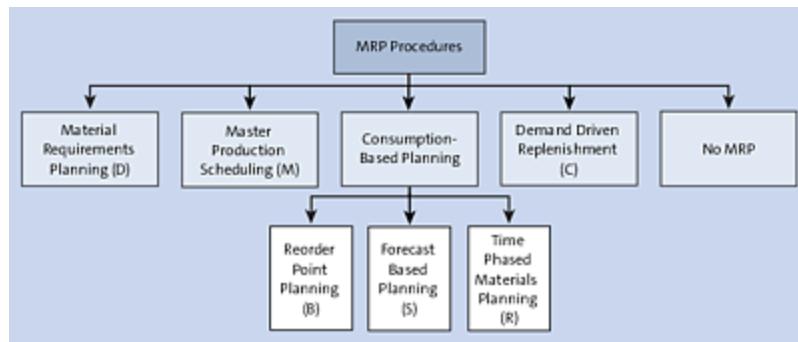


Figure 4.1 MRP Procedures

The MRP procedures are described here:

- **Material requirements planning (D)**

Sales orders or sales forecasts (planned independent requirements [PIRs]) are the main input to MRP. Apart from these two requirements, the system also considers production orders, firmed planned orders, material reservations, dependent requirements, and comparisons with existing (on-hand) stock to calculate the next requirements. If the on-hand stock isn't enough to fulfill the requirement quantities, then MRP generates procurement proposals.

For in-house-produced materials, planned orders will be generated irrespective of classic MRP or MRP Live. These generated planned orders can be converted to production orders

(for the repetitive manufacturing [REM] environment, production can be started with planned orders, which we'll cover in [Chapter 6](#)).

For externally procured materials, only purchase requisitions will be created while planning with MRP Live. With a classic MRP run, the planner will have the option either to create a planned order or directly create a purchase requisition. The created planned order must be converted to a purchase requisition so that it can be further converted to a purchase order for all practical procurement purposes.

MRP Live always creates delivery schedule lines for all the materials with valid scheduling agreements. Further details of the planning process will be discussed in the next section.

- **Master production scheduling (MPS) (M)**

Master production materials are high-value materials or materials that require critical resources in a company. These can be raw materials, semifinished materials, or finished materials, which have a higher influence on the supply chain. The purpose of MPS is to have greater control on the cost-intensive materials and to have the bottleneck resources planned appropriately well in advance so that the overall planning process for the organization is conducted and executed smoothly. MPS is also one type of MRP, and the logic is like MRP.

An MPS run is executed separately for all materials where the MRP type is set appropriately in the material master **MRP 1** view. In classic MRP, there is a set of transaction codes available for execution of MPS runs.

After an MPS run, it's always advisable to execute capacity leveling so the bottleneck resources are appropriately leveled,

enabling subsequent MRP runs to yield good results in keeping with the overall production plan and with execution as close to reality as possible.

[»] Note

Deterministic replenishment procedures consider the customer requirements or independent requirements to create the replenishment elements, for example, MRP. Consumption-based planning procedures are also called *stochastic replenishment procedures*.

- **Consumption-based planning**

Consumption-based planning uses past consumption data to predict future requirements via material forecasts or statistical methods. The requirements determination is triggered by forecast requirements calculated using historic consumption values or the on-hand stock falling below a reorder point quantity.

Various consumption-based planning methods were used before the MRP era and are still widely used in the industry. Various methods are also available with SAP S/4HANA. These methods are usually used to plan for relatively inexpensive materials or operating supplies in manufacturing industries.

There are various MRP procedures used in consumption-based planning. **Reorder Point Planning (B)** is one of the popular methods in which a reorder point is set manually in the material master in conjunction with the appropriate MRP type. In this method, when the actual stock falls below the reorder point, the system includes this material in the next planning run. Similarly, there are other MRP types for automatic calculation of reorder point. **Forecast Based Planning Procedure (S)** is one more type

of planning procedure where the forecast run must be executed periodically to determine the future forecast values based on historical data. Forecast parameters are maintained in the **Forecasting** view of the material master. You can either maintain the forecast model directly or have it determined automatically. Another MRP procedure is **Time-Phased Materials Planning (R)**, which can be used if a material is planned periodically or in a regular cycle. If a vendor delivers a material on a certain day of the week, it's better to plan the material following this cycle. A planning calendar is used as a planning cycle, so defining an appropriate planning calendar is a prerequisite.

- **Demand-driven replenishment (C)**

Demand driven replenishment (DDR), or demand-driven MRP (DDMRP), was introduced in SAP S/4HANA with release 1709. New MRP type D1 was introduced as well to perform DDMRP, which comprises elaborate steps to perform. We'll cover DDMRP in detail in [Chapter 9](#).

DDMRP was first introduced by the Demand Driven Institute (DDI), and it gained lot of interest in the manufacturing industry. Demand-driven concepts are introduced only in SAP Fiori, so usage of SAP Fiori is mandatory.

- **No MRP**

If a planner decides to exclude some materials from the planning, the appropriate MRP type is no planning (ND). Even though the material may not be relevant for planning purposes, the other logistical processes, such as creation of a sales order or a production order, are still possible for these materials if other necessary data is maintained.

4.3 Planning Process

The planning process developed in SAP S/4HANA is a fixed algorithm that is executed every time you plan a material with MRP. This is true with classic MRP and MRP Live. The planning steps are shown in [Figure 4.2](#). In the next subsections, we'll discuss the planning process steps. You can expect questions in the certification exam to check your understanding of these planning steps.

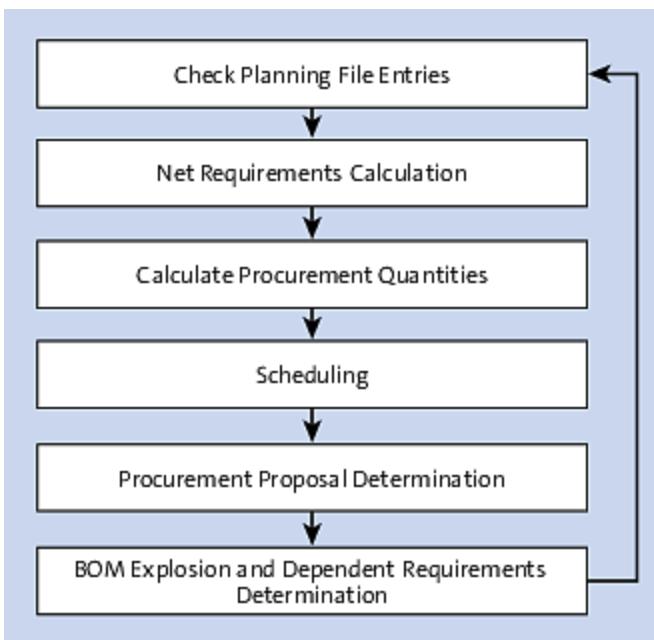


Figure 4.2 Process Steps in MRP

4.3.1 Checking Planning File Entries

The first thing MRP checks during the planning is the availability of material in the planning file. Whenever a planning-relevant change happens to a material, the material is marked in the planning file, and the material will be part of the next planning run. The planning file entry is automatically created for a material if MRP views are maintained and the appropriate MRP type is selected. There are

approximately 50 different actions that can cause planning-relevant changes, for example: posting of goods movements or stock updates, creation of sales orders, reservations, production orders, and purchase orders. Master data changes also cause planning file entries for the materials, for example, material master field-level changes that impact the planning run. Bill of materials (BOM) changes will cause the activation of the **Explode BOM** indicator in the planning, but routing changes won't have any impact on the planning file. If routing is changed, the system won't set the planning file entry **Explode BOM** for this material. If you want to include this change in the planning run, then select planning mode **2 (Delete and Recreate Planning Data)** in your MRP run.

The low-level code of each material is also stored in the planning file, which will be copied from the material master. The MRP run will check the low-level code of each material and plan accordingly. In the BOM structure, the highest-level material will have the lowest-level code, which means the finished product at the top of the BOM structure will have low-level code of 000, materials in the next level in the BOM structure will receive 001, and so on. Planning always starts with the 000 code level and progresses to the next level to ensure that the components will never be planned before their parent materials.

Materials that will be planned should be considered in the planning run. As the MRP run is resource intensive, not all the materials are always required to be planned. If any planning-relevant change happens, only the material must be planned, which is why check planning file entries is the first step in MRP run. When MRP is executed in SAP S/4HANA, you can choose between two planning run types: *regenerative planning run*, where all the materials are considered in the planning run, and the *net change planning*, where only the materials with planning file entries marked will be planned.

As shown in [Figure 4.3](#), the **NChge plng** (net change) flag and **ExplodeBOM** flag are active for this material. Therefore, if there is a change in the BOM for this material, the BOM will be exploded during the next planning run, and the dependent requirements will be recalculated because of the change in the BOM. After the MRP run, both flags will be unchecked. If there is a planning-relevant change that happens for this material, then only this material will be part of the next planning run; otherwise, the MRP run won't consider this material for the net change planning run.

There are also checks related to other planning procedures such as the **MPS ind.** and time-phased materials.

You can also create planning file entries manually with Transaction MD20. This is to ensure that the material is included in the next planning run. For SAP S/4HANA, the planning file is simplified and enhanced for better performance. Planning file entries are saved to table `PPH_DBVM`. To set up the planning file entries and for consistency checks, you can use report `PPH_SETUP_MRPRECORDS`.

| Display planning file entries | | | | | | |
|---|---------------|----------|--|--------------------------|-----------|------------|
| | | | | | | |
| Plan. file entries | | | | | | |
| Material | TS422_SF032 | Plnk | 1730 | No. of entries | 1 | |
| | | | <th>NETCH planning file ent.</th> <td>1</td> <th></th> | NETCH planning file ent. | 1 | |
| | | | <th>NETPL planning file ent.</th> <td>1</td> <th></th> | NETPL planning file ent. | 1 | |
| Current data from 24.02.2021 At 13:34 Tim | | | | | | |
| R-Cde | Material | MRP Area | MPS Ind. | NChge plng | NChgePhr. | ResetProps |
| 1730 | TS422_SF032 | 1730 | <input type="checkbox"/> | X | X | X |
| ExplodeBOM | Planning date | | | | | |

Figure 4.3 Display Planning File Entries: Transaction MD21

[»] Note

View SAP Note 553746 for additional information on planning file entries.

4.3.2 Net Requirements Planning

After checking the planning file for material entries, the MRP run performs a calculation to check whether the requirements can be covered with the existing stock and fixed receipts, such as production orders, purchase orders, and so on. If there is a shortage quantity for requirements dates, procurement proposals will be created.

The requirements elements are sales orders, customer independent requirements, PIRs, dependent requirements, material reservations, and forecast requirements. The fixed receipts also include firmed planned orders or firmed purchase requisitions.

Safety stock also plays a role in the net requirements calculations. If a safety stock will be managed for a material, the system also prioritizes the safety stock.

The net requirements calculation slightly differs for materials planned with reorder point planning where the system ignores safety stock in the calculation. If the stock falls below the safety stock, an appropriate exception message is given. Plant stock plus the firmed receipts are considered as the total plant stock in this case. If this total stock falls below the reorder point, a procurement proposal will be created. For forecast-based planning, the system only considers forecast requirements. The other requirements, such as sales orders or production orders, aren't considered in the calculation.

[»] Note

For a make-to-order (MTO) strategy, the plant stock isn't considered in the net requirements calculation.

For a make-to-stock (MTS) strategy with gross requirements calculation, the plant stock is also ignored for net requirements calculation.

4.3.3 Procurement Quantity Calculation

After the net requirements calculation, when there is a shortage quantity to be fulfilled, the system checks for the following information and processes to determine the procurement quantities, that is, production and purchasing quantities:

- **Lot sizing**

The lot-sizing procedure is maintained in material master **MRP 1** view. The system adjusts the shortage quantities to the lot-size requirements and arrives at the lot size for procurement.

- **Rounding**

If a rounding value or rounding profile is maintained, the system rounds off the lot size and determines the procurement quantity.

- **Scrap quantity**

If the scrap quantity is maintained in the material master or in the BOM, it will also be taken into consideration, and total procurement quantity will be calculated. The rounding values also influences the scrap quantity calculation and overall lot size to determine the final quantities for procurement.

We'll go into more details about these topics next.

Lot sizing specifies the quantity the system should propose when it identifies a quantity shortage of a material. The SAP system delivers

standard lot-sizing procedures that are ready to be assigned in the material master **MRP 1** view, as shown in [Figure 4.4](#).

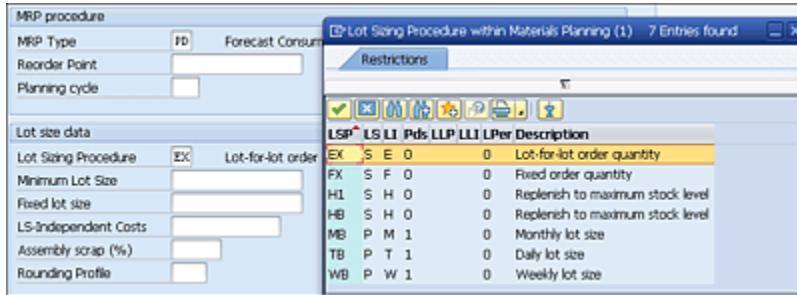


Figure 4.4 Lot-Sizing Procedure in the Material Master

The lot-sizing procedures can be divided into the following categories:

- Static lot-sizing procedures
- Period lot-sizing procedures
- Optimum lot-sizing procedures

The static lot-sizing procedure is further categorized as lot-for-lot or exact lot sizing, fixed lot sizing, and replenish to maximum stock level. The most-used lot-sizing procedure is the lot-for-lot procedure (EX), in which the system creates procurement proposals that correspond exactly to the shortage quantities.

[+] Note

For the lot-for-lot (EX) order quantity, the system groups requirement quantities for the same day together in one procurement.

If you use the fixed lot-sizing procedure (FX) by maintaining the **Fixed lot size** quantity in the material master **MRP 1** view, the system will create the procurement proposals with this quantity. If the

shortage can't be covered with the quantity, then a multiple of the fixed quantity will be calculated, and procurement proposals will be created.

Periodic lot-sizing procedures combine all the requirements in the period and propose a single replenishment proposal. The periods can be day, week, month, or flexible using a planning calendar. If you want to have a single replenishment proposal per day, then you can use the daily lot-sizing procedure (TB). Similarly, the weekly lot-sizing procedure (WB) and monthly lot-sizing procedure (MB) are available if you want to combine the requirements per week or per month, respectively, and to have a single procurement proposal.

In the optimum lot-sizing procedure, the system tries to group together the shortage quantities so that the storage costs, setup costs, or ordering costs can be minimized. There are various optimum lot-sizing procedures available, but they are seldom used.

There are additional settings in material master, such as **Minimum Lot Size** and **Maximum Lot Size**, which can be used to ensure that the replenishment quantities will never fall below the minimum lot-size quantity or exceed the maximum lot-size quantity, respectively.

During various stages of production, if a scrap quantity is generated, then the scrap quantity can be planned, excess quantities can be ordered in advance to accommodate the additional component or assembly needs. and the production costs can be calculated. Three types of scrap can be managed in SAP S/4HANA:

- **Assembly scrap**

Assembly scrap refers to the unusable assemblies or subassemblies produced during production. To plan for the assembly scrap quantity, you can input the assembly scrap as a percentage in the **Assembly scrap (%)** field in the **MRP 1** view of

the material master, as shown in [Figure 4.5](#). During the planning run, the assembly scrap quantity increases the total order quantity; because of the increase, the dependent requirement quantities will also be increased. For example, if the assembly scrap is maintained as 10%, then for an order quantity of 100 PC, the calculation will be $(100 + 100 * 10\%) = 110$ PC.

| Lot size data | |
|----------------------|----|
| Lot Sizing Procedure | EX |
| Minimum Lot Size | |
| Fixed lot size | |
| LS-Independent Costs | |
| Assembly scrap (%) | 10 |
| Rounding Profile | |
| Maximum Stock Level | |
| Storage Costs Code | |
| Takt time | |
| Rounding value | |

Figure 4.5 Assembly Scrap in the MRP 1 View

- **Component scrap**

For various reasons, the component scrap may be generated during production. Component scrap quantity can be maintained in the **MRP 4** view, as shown in [Figure 4.6](#). When a component scrap is maintained, the scrap quantity will increase the order quantity of the dependent requirements of the components. If an assembly scrap quantity is maintained for the higher-level assembly, the overall procurement of the component quantity will also increase.

| BOM explosion/dependent requirements | |
|--------------------------------------|-------------------------------------|
| Individual/coll. | 2 |
| Version Indicator | <input checked="" type="checkbox"/> |
| | |
| Component Scrap (%) | 5 |
| Requirements group | |
| MRP dep.requirements | |

Figure 4.6 Component Scrap in the MRP 4 View

The component scrap can be maintained in the BOM also, as shown in [Figure 4.7](#).

- **Operation scrap**

Operation scrap can be maintained in the BOM, as shown in

Figure 4.7. If the value of the component is higher, then it's advisable to maintain the operation quantity rather than the assembly quantity. Apart from the **Operation scrap in %** field, you must also select the **Net ID** indicator.

| Quantity Data | |
|----------------------|-------------------------------------|
| Quantity | 1 |
| Operation scrap in % | 2 |
| Fixed Quantity | <input type="checkbox"/> |
| Component Scrap (%) | 5 |
| Net ID | <input checked="" type="checkbox"/> |

Figure 4.7 Component Scrap and Operation Scrap in the BOM

4.3.4 Scheduling

The main question of when to procure/produce the required materials is determined during the *scheduling* process. MRP determines the shortage date on which the materials are needed, and this shortage date is the end date of the replenishment proposal. With backward scheduling, considering the lead times maintained in the material master determines the start date of the replenishment proposal. It may happen that the replenishment start date determined by backward scheduling falls in the past. In that situation, the system will switch to *today scheduling*, and MRP will switch to *forward scheduling* to calculate the replenishment finish date.

For reorder point planning, the system will always consider the forward scheduling. When the on-hand stock falls below the reorder point, MRP considers this material in the planning run and determines the availability date.

For in-house production, there is a distinction between basic date scheduling and lead-time scheduling. In both cases, the latest finish date is the last date on which the material should be produced and available, and the earliest start date of the production is the start

date on which the order should start. The two scheduling methods are described here:

- **Basic date scheduling**

The system considers in-house production time, GR processing time, and the opening period defined in the scheduling margin key from the material master to determine the order dates. For backward scheduling, these three periods are deducted from the requirements date to determine the order start date. For forward scheduling, the system doesn't consider the opening period, and the order start date is considered as today's date.

- **Lead-time scheduling**

The system considers the data maintained in the routing to calculate the order dates and times. Order quantity, standard values maintained in the routing operations, and scheduling formulas maintained in the work centers are part of the calculation and dates determination.

For external procurement of components, the system considers planned delivery time, GR processing time maintained in the material master, and the purchasing processing time maintained in the customization. With MRP Live, for external procurement, the system always creates purchase requisitions, so the opening period from the scheduling margin key isn't relevant in this case. For external procurement, only the basic date scheduling is relevant.

4.3.5 Determining the Procurement Proposal

After determining scheduling requirements, MRP finds out what type of procurement proposal will be created. The procurement proposal made by the MRP is dependent on the **Procurement Type** maintained in the material master **MRP 2** view, which is a mandatory

field. There are three possible procurement types, as shown in [Figure 4.8 ①](#):

- E: In-house production
- F: External procurement
- X: Both procurement types

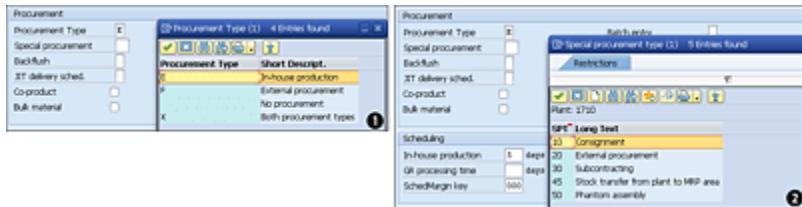


Figure 4.8 Material Master MRP 2 View: Procurement Type and Special Procurement Type

In fact, a fourth procurement type is also available called **No Procurement**, which is of no significance and can't be selected from the dropdown menu.

Based on the procurement types, MRP creates appropriate procurement elements. For in-house-produced materials, MRP will always create planned orders. These planned orders are converted to production orders or process orders for production execution. For REM, production execution can commence based on the planned orders, which are run schedule quantities of order type PE, which can't be converted to production orders.

For external procurement, MRP creates purchase requisitions, which are converted to purchase orders for procurement activities. If the materials are procured with a long-term agreement with the suppliers, then scheduling agreements are created for these materials. Based on the scheduling agreements, during the MRP run, schedule lines (delivery schedules) are created.

For semifinished products, for example, that are produced in-house generally but due to capacity constraints are procured externally, you choose **Both procurement types**. In this case, MRP will create planned orders. Based on the situation, planned orders can be converted to either production/process orders or purchase requisitions (which are in turn converted to purchase orders).

MRP will also check if any value is maintained for the **Special procurement** field in the material master, as shown in [Figure 4.8](#) ②. **Special procurement** is maintained in conjunction with **Procurement Type** and forms a special scenario of planning with MRP. Some of the special procurement types are **Consignment**, **Subcontracting**, and **Phantom assembly**; we'll cover some of these topics at the end of this chapter.

In determining the procurement proposals, source of supply determination is the next step. For in-house-produced materials, the production version is the source of supply. Depending on which BOM and routing are used or if a material can be produced on different production lines, then you can use the production version and quota arrangement to determine partial production quantities in different production lines. For externally procured materials, the system can determine the source of supply with the source list, purchase info records, scheduling agreement, and quota arrangement.

4.3.6 Determination of Source of Supply

Sourcing is simplified in SAP S/4HANA, as shown in [Figure 4.9](#), and can be internal procurement or external procurement. For in-house-produced materials and subcontracting, the production version is mandatory. Based on the production version only the BOM is

selected. It will also consider quota arrangement, if maintained, to determine a specific production version.

For an external procurement, the system will always create purchase requisitions. The system first checks if any quota arrangement is available; if so, sourcing will be performed based on the quota arrangement. Next in priority is the source list for a given period. The system checks for a scheduling agreement and creates schedule lines/delivery schedules. Contract will have a higher priority than purchase info records.

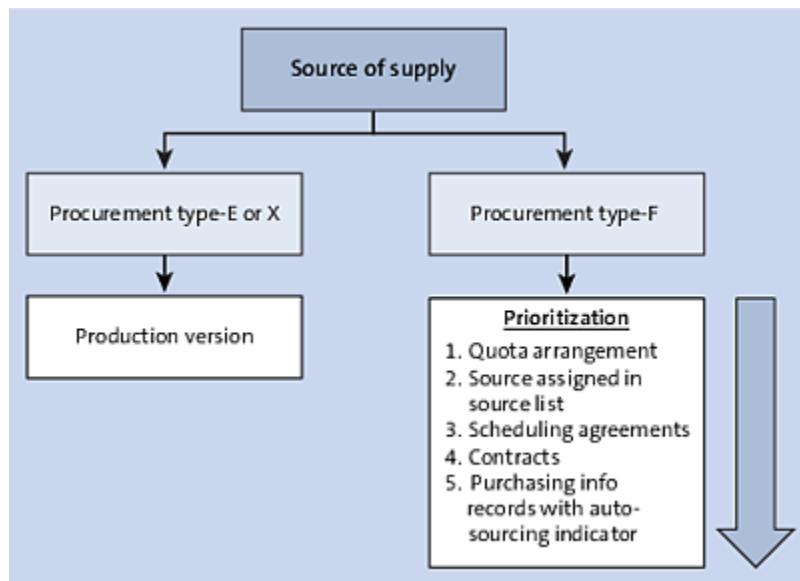


Figure 4.9 Source of Supply Determination

[»] Note

Refer to SAP Note 2614920, which explains that the system will create an entry in table `CDS_M_PUR_SOS_B` if a purchasing document (scheduling agreement, contact, purchasing info record, etc.) is created and will assign the priority from 1 to 12. The MRP run will consider and select the source of supply appropriately.

4.3.7 BOM Explosion and Determining Dependent Requirements

For in-house-produced materials, as discussed in the previous section, the source of supply is determined based on the production version selected. With the appropriate production version, the BOM will be selected for the creation of planned orders.

MRP will also go into the details of the BOM and find the BOM components, which are the dependent requirements for the materials. As discussed in the “Checking Planning File Entries” section, the system will check the planning file of the component materials sequentially and consider in the planning run the appropriate planning elements to create. This BOM explosion process continues for all levels of materials.

In the MRP run, while finding the appropriate dependent materials, the first thing to check is whether the component is relevant for production, as the MRP run only considers components that are relevant for production. The **Production Relevant** indicator is maintained in the **BOM Item** details. MRP also checks if there are any alternate items maintained for the BOM components, which will be considered in the planning run. In addition, if any material is maintained for discontinuation, these materials will also be taken into consideration.

The next check is whether an assembly/subassembly is maintained as a phantom material; if so, MRP won’t consider this phantom material in the MRP run, but all the components in or related to this phantom will be considered in the planning run. For calculating the dependent requirements date, the system checks whether a distribution key is maintained and the lead-time offset to determine the date.

MRP determines the issue storage location for the BOM components as well, which is important to maintain in the planned order. You can see the **Issue Storage Location** Information updated in the **Components** overview of the planned order. The system follows this series of checks:

1. First, the system checks in the BOM item details, and if not maintained, moves to the next step.
2. Next, the system checks in the MRP group customization for the assembly to determine the issue storage location (it follows a stepwise strategy based on MRP group customization settings), if this MRP group customization is missing or MRP group isn't maintained for the assembly, the system moves to the last step.
3. At the end, the system checks the production storage location of the components and considers it as the issue storage location.

4.3.8 Exception Messages Creation

During the planning process, if MRP encounters any situation that needs to be brought to the attention of the MRP controller, MRP will create exception messages. In general, MRP controllers can take care of the exceptions, but, in certain situations, the MRP run will be terminated for a material, and an appropriate message will be issued. The most common exception messages are rescheduling messages, that is, rescheduling in or rescheduling out (postpone process).

Exception messages are grouped together and can be seen in the **Stock/Requirements List** in the SAP S/4HANA system or in the **Manage Material Coverage** Fiori app.

4.4 Master Data for Material Requirements Planning

Material master **MRP** views control the planning process. Most of the fields maintained in **MRP 1** to **MRP 4** views and a few fields from the **Work Scheduling** view are important for the planning process.

Production planning and detailed scheduling (PP-DS) is embedded in the SAP S/4HANA system, so the **Advanced Planning** view of the material master is also important for the MRP run. We'll discuss this material master view in [Chapter 9](#). In this section, we'll go through the most important sections of the **MRP** tab pages and relevant sections.

The **MRP 1** view carries the most important planning-related data, such as MRP group, MRP Type, lot size data, and MRP areas. The **MRP 2** view holds information related to procurement and special procurement, which we discussed earlier, as well as scheduling and net requirements calculation data. The **MRP 3** view contains planning and planning-strategy-related information (in [Chapter 3](#), we discussed in detail various planning strategies and related field-level settings of the other dependent fields). This view also contains availability check information, which we'll cover in upcoming chapters. The **MRP 4** view contains BOM explosion/dependent requirements, discontinuation of parts, and REM-related information. We'll discuss some of the topics in the following list here, and the other topics will be covered in the next section of this chapter:

- **MRP type**

How a material is planned is determined by the MRP type. As discussed earlier in “[Section 4.2](#),” the standard SAP S/4HANA system provides various out-of-the-box MRP types for usage, as shown in [Figure 4.10](#). The code for the MRP types for MPS and

MRP starts with “M” and “P”, respectively. Planning results can be firmed in the planning time fence, based on the type of different firming MRP types are created. For example, **MRP Type P1** means the planning proposals are automatically firmed if they are at least one day inside the planning time fence, and the new planning proposals will be moved out to the end of the planning time fence. MRP won’t change the firmed planned orders. This is to protect the master plan for execution, so that the production operations can be stable, and the new orders won’t impact the production plan. The planning time fence is maintained in workdays in the material master **MRP 2** view.

Apart from the standard available MRP types, you can also customize the MRP types based on the business need via **Production • Material Requirements Planning • Master Data • Check MRP Types** or Transaction OMDQ.

| MRP Type | MRP Type Description |
|----------|---|
| D1 | Demand-Driven Replenishment, fixing type -1- |
| M0 | MPS, FCST Consumption, No Firming |
| M1 | MPS, FCST Consumption, Auto Firming, New Ords after PTF |
| M2 | MPS, FCST Consumption, Auto Firming, No New Ords in PTF |
| M3 | MPS, FCST Consumption, Manual Firming, New Ords after PTF |
| M4 | MPS, FCST Consumption, Manual Firming, No New Ords in PTF |
| ND | No planning |
| P1 | Forecast Consumption, Auto Firming, New Ords after PTF |
| P2 | Forecast Consumption, Auto Firming, No New Ords in PTF |
| P3 | Forecast Consumption, Manual Firming, New Ords after PTF |
| P4 | Forecast Consumption, Manual Firming, No New Ords in PTF |
| PD | Forecast Consumption, No Planning Time Fence |
| R1 | Time-phased planning |
| R2 | Time-phased w.auto.reord.point |
| RE | Replenishment plnd externally |
| RF | Replenish with dyn.TargetStock |
| RP | Replenishment |
| RR | Time-phased replenishment with dynamic target stock |
| RS | Time-phased replenishment planning |
| V1 | Manual reord.point w. ext.reqs |
| V2 | Autom. reord.point w. ext.reqs |
| V8 | Reorder-Point Planning |
| VI | Vendor Managed Inventory |
| VM | Automatic reorder point plng |
| VS | Seasonal MRP |
| VV | Forecast-based planning |
| X0 | W/O MRP, with BOM Explosion |

Figure 4.10 MRP Types (Customization)

- **MRP controller**

The MRP controller is the person or group of persons responsible for planning materials and resolving any planning-related issue or handling of exceptions. Various planning-related evaluations can be performed based on the MRP controller, and while executing MRP Live, you can select the relevant materials based on the MRP controller. MRP controllers are also known as planners. **MRP controller** is a mandatory field and must be maintained if the material is relevant for planning. So, if you select the **MRP Type** as **ND No planning**, then the MRP controller doesn't need to be maintained.

MRP Controller can be created with the customized menu path **Production • Material Requirements Planning • Master Data • Define MRP Controllers** or with Transaction OMD0.

- **MRP area**

For an effective planning process and to improve the overall effectiveness and simplicity, many simplifications were undertaken in SAP S/4HANA compared to SAP ERP. The improvements are growing with each SAP S/4HANA release. One of the main simplifications is the increased prominence of MRP areas. MRP areas were available in SAP ERP, but their usage is mandatory in SAP S/4HANA. MRP areas are also organizational units like storage locations and plants. MRP can be executed specific to an MRP area.

In SAP ERP, it was possible to plan a material separately at a storage location level. But with SAP S/4HANA, this feature was removed and simplified with MRP areas. So, if you want to plan a material at a storage location or set of storage locations, and then plan materials for subcontracting, you can use MRP areas. In other words, if a material isn't assigned to any storage location MRP or subcontracting MRP, then this material is assigned to a

plant MRP area. Plant MRP areas include all the storage locations and subcontracting stock.

MRP areas can be assigned to a material in the **MRP 1** view, as shown in the [Figure 4.11](#). With MRP areas, the materials will almost all be MRP-relevant fields and can be planned extensively, including advanced planning with PP-DS. After a material is assigned to an MRP area, the system will automatically set the **MRP Area exists** checkbox.

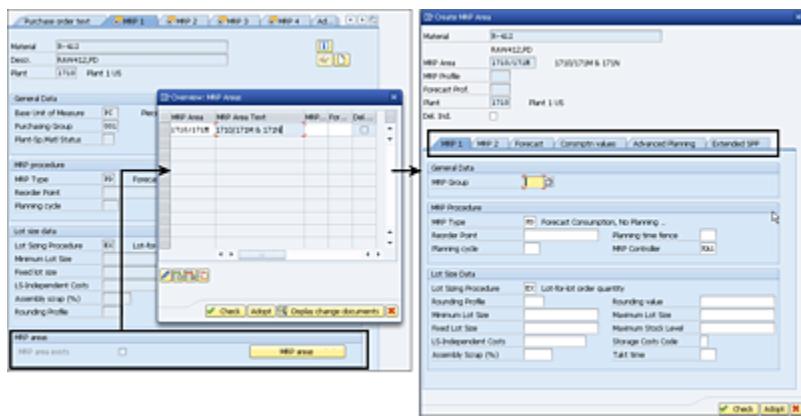


Figure 4.11 MRP Areas in the MRP 1 View

When the material is assigned to an MRP area, the material will be planned separately at the storage location MRP area level. As shown in [Figure 4.12](#), the net change planning is activated at the storage location MRP area level.

| Display planning file entries | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------|--------------------------|-------------------------------------|------------|------------|----------------|---------------|-------------------------|---------------|-------------------------|------|--------------------------|-------------------------------------|---|---|--|--|-------------|-----------|--------------------------|-------------------------------------|--|--|--|--|
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plan. file entries | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>Material</td><td>R-412</td></tr> <tr> <td>Plant</td><td>1710</td></tr> <tr> <td>No. of entries</td><td>2</td></tr> <tr> <td>NETCH planning file ent</td><td>1</td></tr> <tr> <td>NETPL planning file ent</td><td>1</td></tr> </table> | | Material | R-412 | Plant | 1710 | No. of entries | 2 | NETCH planning file ent | 1 | NETPL planning file ent | 1 | | | | | | | | | | | | | | |
| Material | R-412 | | | | | | | | | | | | | | | | | | | | | | | | |
| Plant | 1710 | | | | | | | | | | | | | | | | | | | | | | | | |
| No. of entries | 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| NETCH planning file ent | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| NETPL planning file ent | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Current data from 29.03.2021 At 19:07 Tim | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>R-Cde/Material</th> <th>MRP Area</th> <th>MPS Ind.</th> <th>NChgePlng</th> <th>NChgePhor.</th> <th>ResetProps</th> <th>ExplodeBOM</th> <th>Planning date</th> </tr> </thead> <tbody> <tr> <td>R 003 R-412</td> <td>1710</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>B 003 R-412</td> <td>1710/1710</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | R-Cde/Material | MRP Area | MPS Ind. | NChgePlng | NChgePhor. | ResetProps | ExplodeBOM | Planning date | R 003 R-412 | 1710 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | X | X | | | B 003 R-412 | 1710/1710 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | | | | |
| R-Cde/Material | MRP Area | MPS Ind. | NChgePlng | NChgePhor. | ResetProps | ExplodeBOM | Planning date | | | | | | | | | | | | | | | | | | |
| R 003 R-412 | 1710 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | X | X | | | | | | | | | | | | | | | | | | | | |
| B 003 R-412 | 1710/1710 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |

Figure 4.12 Storage Location MRP Area and Planning File Entries

There is a new feature with SAP S/4HANA 2020 release, you can automatically assign the storage location MRP area to a material, when this material is extended to one of the storage locations in this MRP area. This also comes with some default values specified to the MRP fields. For this defining an MRP area profile and assigning this profile in the MRP area customization, which we'll cover with MRP customization in [Section 4.5](#).

- **Planning calendar**

Time-phased materials planning is used to align with the delivery cycle of a supplier if the supplier delivers a material on a certain day. This planning cycle is maintained in the **MRP 1** view and can be defined as a planning calendar. This planning cycle (i.e., planning calendar) is defined in Transaction MD25. This activity creates a transport request, so it's a customization activity.

There is one more useful feature of the planning calendar, which is maintained in the **MRP 2** view of a material. This is used in conjunction with the periodic lot-sizing procedure, especially **Period lot size according to planning calendar PK**. This lot-sizing procedure is used when daily/weekly/monthly lot-sizing procedures aren't suitable and follows a specific period pattern based on your own requirements or based on the delivery from vendors (e.g., the period pattern is every Tuesday and Thursday).

In [Figure 4.13](#), you can see a few options for the planning calendar, which you can use either in the **Planning cycle** field (in the **MRP 1** view) or **Planning calendar** field (in **MRP 2** view).

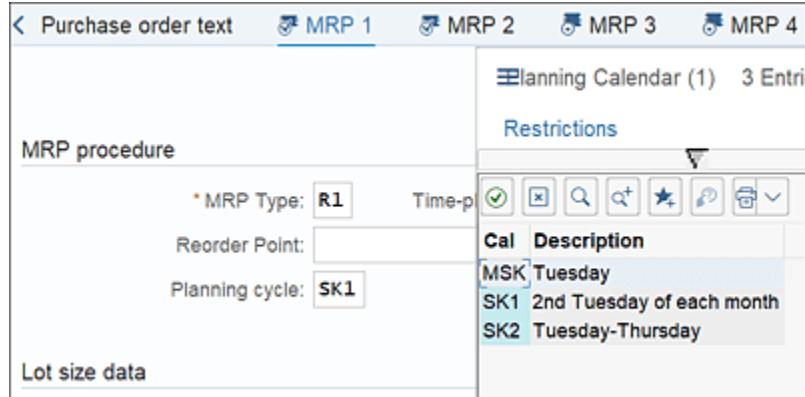


Figure 4.13 Planning Cycle/Planning Calendar

4.5 Material Requirements Planning Customization

In this section, we'll cover the most important MRP-related customizations and start with customization of the overall plant parameters and MRP groups. Then, because we just discussed the MRP areas in the previous section, we'll customize MRP areas. We've already covered some of the other important customizations such as MRP type, MRP controller, and so on in the earlier sections. The aim of this section is to introduce you to the most important customizations as opposed to all of the possible customizations.

[»] Note

When creating the plant code, the system will automatically set the planning relevancy active for the plant, so you don't need to maintain the planning relevancy, and it isn't required in SAP S/4HANA. If this setting is missed, however, it's still possible to maintain the plant planning relevancy in Transaction OMDU.

4.5.1 Maintain Plant Parameters

This one customization combines most of the MRP-relevant topics covered into one transaction. The overall maintenance of plant parameters is maintained at the plant level, and these parameters form the default parameters for planning. These parameters at the plant level can be overruled by other settings such as MRP group and material master settings.

To access the overall maintenance of plant parameters, use
Production • Material Requirements Planning • Plant Parameters

- Carry Out Overall Maintenance of Plant Parameters or Transaction OPPQ. The **Maintain Plant Parameters** screen is shown in [Figure 4.14](#).

New plants are generally created by copying the existing plant. In that case, these plant parameters will also be created for the new plant, so explicit maintenance may not be needed. But a cross-check of the maintained settings in each area is required to validate whether the available settings are indeed the required settings or if any change is needed. In the following, we'll discuss further details of the customization settings. If the details are maintained for a specific section or object, the system will show it as **Maintained**; if not, it will appear as **Initial**.



Figure 4.14 Maintain MRP Parameters

4.5.2 Maintain Environment

In the **Maintain Environment** section, as shown in [Figure 4.15](#), there are three important settings:

- ① Number Ranges
- ② Check Rule: Backorders
- ③ Reporting

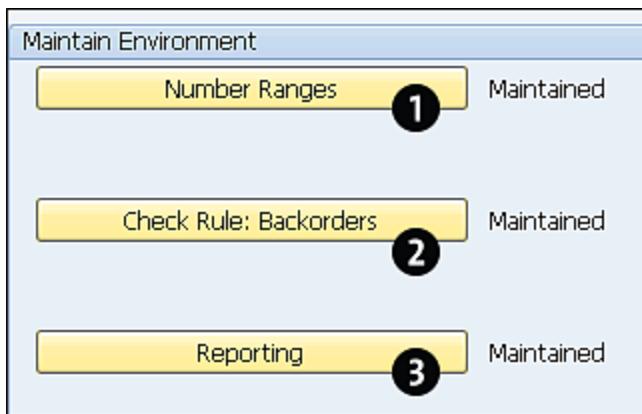


Figure 4.15 Maintain Environment

These settings are discussed in more detail in the following list:

- **Number Ranges**

The number ranges for the objects created during the MRP run are shown in [Figure 4.16](#). These number ranges should always be internal. If you want to maintain or create new number ranges, use Transaction OMI2. These number ranges are used by MRP while planning. However, if you want to make a distinction between automatically created objects and manually created objects, for example, for planned orders, purchase requisitions and so on,

then you can have separate number ranges for manually processed order objects via Transaction OMI3.



Figure 4.16 Maintain MRP Number Ranges

You can also distinguish the number ranges between planned orders created by MRP and simulative planned orders created by MRP. The standard setting is to have both share the same number range, but you can change this setting to distinguish between them.

- **Check Rule: Backorders**

The checking rule for backorder processing is updated for Backorder Processing CO06.

- **Reporting**

This customization is related to the MRP evaluations, as shown in [Figure 4.17](#). With the **Grouping periods** setting, you can specify

which periods will be displayed for period totals in the **Stock/Requirements List** and **MRP List**. The **Receipt days' supply** setting will display the receipt elements that will be used for receipt days' supply calculation. With the **Evaluation Prof.** setting, you can select the evaluation profile for a range of coverage data.

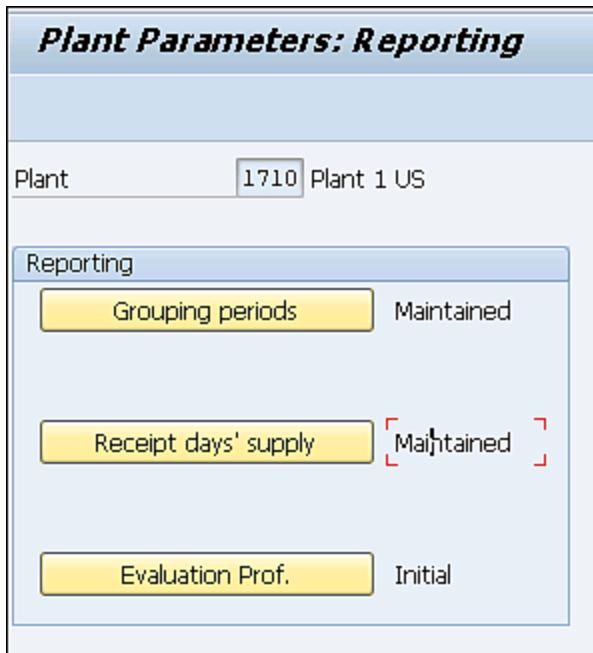


Figure 4.17 Plant Parameters: Reporting

4.5.3 Maintain Master Data

As shown in [Figure 4.18](#), **Maintain Master Data** contains the **MRP Controllers**, **Special Procurement**, and **FLOATS** buttons. We've

already discussed MRP controllers as part of master data, so we'll focus on the details for special procurement **1** and floats **2**.

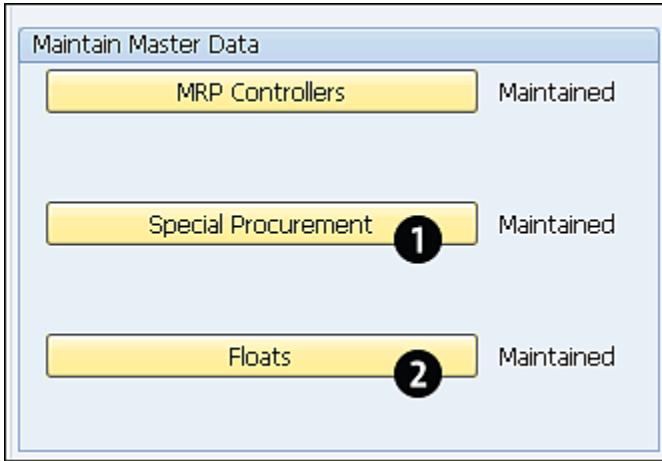


Figure 4.18 Maintain Master Data

With **Special Procurement**, you can define the procurement much more precisely than with the procurement type. For in-house production, a phantom assembly can be special procurement, and for external procurement, consignment can be special procurement.

Phantom assembly settings are shown in [Figure 4.19](#). Phantom assemblies are used to simplify BOM maintenance. If you want to maintain a phantom assembly, then the assembly should be maintained with **Procurement type** in the material master as **E In-**

house production, and special procurement type (Sp.Pr.Type) in the header area should be set as **50 phantom assembly**.

The screenshot shows the SAP Fiori interface for configuring a special procurement type. The top section displays the plant (1710) and special procurement type (50, highlighted in yellow). Below this, the 'Procurement type' is set to 'In-house production'. The 'Special Procurement' section is expanded, showing 'Special procurement' set to 'In-house production' and 'Plant' set to a blank field. The 'As BOM Component' section is also expanded, showing several checkboxes: 'Phantom item' (checked), 'Direct Production', 'Direct Procurement', 'Withdr.altern.plant', and 'Multil. Subcontr.'. The 'Issuing Plant' field is also present.

Figure 4.19 Special Procurement: Phantom Assembly

One of the more predominantly customized special procurement types is related to **45 Stock Transfer from Other Plant**. You can create additional special procurement types based on business needs.

Floats are used to determine the basic dates of the planned order. A schedule margin key represents the floats and is assigned to the material master. As the name indicates, these floats are the buffers at various stages of operating planning. Opening period (**Op**) is the buffer given to MRP controllers or planners for converting the planned orders; likewise, there is a float before production (**Fl Bef.**),

float after production (**Fl After**), and for the release period (**Rel. Per.**), as shown in [Figure 4.20](#).

| Change View "Floats for Scheduling": Overview | | | | | | | |
|---|------------|-------|--------|---------|----------|-----------|--|
| Plnt | Name 1 | Ma... | Op.... | Fl Bef. | Fl After | Rel. Per. | |
| 1710 | Plant 1 US | 000 | | | | | |
| 1710 | Plant 1 US | 001 | 10 | 2 | 1 | 5 | |
| 1710 | Plant 1 US | 002 | 2 | 1 | | 1 | |
| | | | | | | | |

Figure 4.20 Floats for Scheduling

4.5.4 Maintain Planned Orders

The **Maintain Planned Orders** section is where the planned orders to production orders, process orders, and purchase requisitions maintenance is managed, as well as the availability for dependent requirements. [Figure 4.21](#) shows these two options with the **Conversion** button ① and **Dep. Reqmt Availability** (dependent requirements availability) button ②.

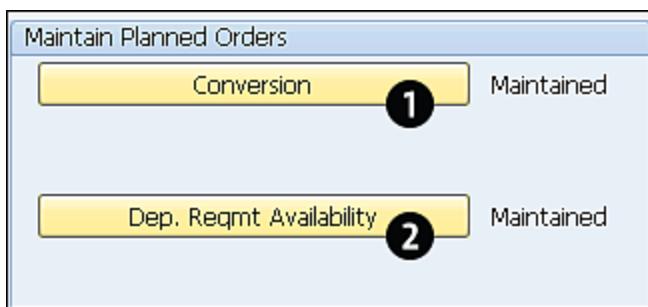
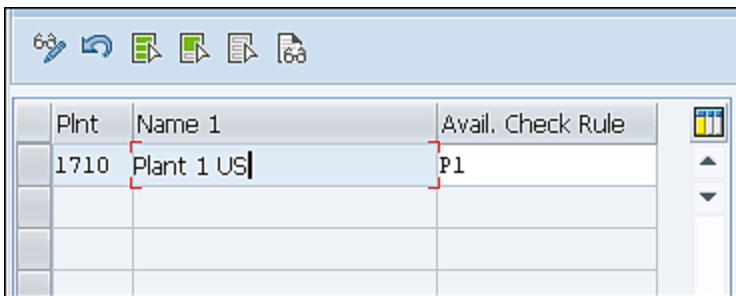


Figure 4.21 Maintain Planned Orders

The **Conversion** button allows you to define the default settings for production or process order types, while converting from planned orders is maintained. This default setting is used while converting from the **Stock/Requirement List**. This is the order type considered while collectively converting the planned orders. The next setting,

which is the maximum number of planned orders to be selected for conversion to purchase requisitions, is also defined.

The **Dep. Reqmt Availability** button defines the availability check rule for planned orders, as shown in [Figure 4.22](#). This works along with the availability checking group maintained in the material master.



A screenshot of a SAP application window showing a table of availability check rules for planned orders. The table has columns: Plnt (Plant), Name 1 (Name), and Avail. Check Rule (Availability Check Rule). A red box highlights the 'Avail. Check Rule' column. The first row shows '1710' in the Plant column and 'Plant 1 USL' in the Name 1 column. In the same row, the 'Avail. Check Rule' column contains 'P1'. The table has a header row and several empty rows below it. The window includes standard SAP navigation buttons at the top.

| Plnt | Name 1 | Avail. Check Rule |
|------|-------------|-------------------|
| 1710 | Plant 1 USL | P1 |
| | | |
| | | |
| | | |
| | | |

Figure 4.22 Availability Check Rule for Planned Orders

4.5.5 Maintain Planning Run

The most important MRP-related settings are maintained in this section of the **Maintain Plant Parameters** screen, as shown in [Figure 4.23](#).



Figure 4.23 Maintain Planning Run

These settings are described in the following list:

- With SAP S/4HANA simplifications, there are some changes to the **BOM/Routing Selection** settings. The sourcing logic for MRP is the production version, so the production version determines the BOM selection. In this setting, the BOM selection ID in combination with BOM usage are prioritized for MRP. The routing selection will be based on the production version only.
- BOM Explosion** defines the control parameters for BOM explosions. There are various options available for selection, as

BOM explosion will be based on **Order start date**, **Order finish date**, **BOM explosion number/order start date**, and so on. This setting also defines whether to create dependent requirements for **Bulk Materials** or not. If this field isn't selected, then during MRP, dependent requirements will be created for bulk materials only for informational purposes. They won't be part of the net requirements calculations. The other settings are related to whether the sales order/WBS BOM is active or not. If the selection is made, the system will check and select sales order BOM or WBS BOM during the MRP run.

- **Parameters for DS** is where detailed scheduling parameters are maintained in this setting. For lead-time scheduling to happen, routing maintenance is required. The order dates are determined in combination with the floats maintained in the scheduled margin key. Apart from these, the following are also defined here: how dates are adjusted during scheduling; whether to use forward scheduling, backward scheduling, or current date scheduling; and how the reduction should happen. The detailed scheduling parameters are maintained at the plant, planner orders' order type, and production scheduler. [Figure 4.24](#) shows the detailed scheduling settings for stock order (**Order type LA**) for **Plant 1710**.

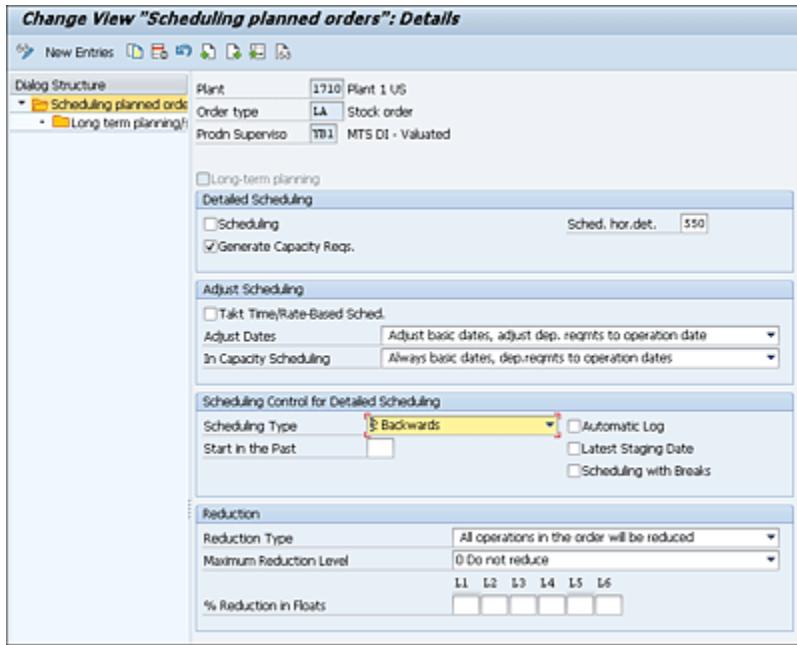


Figure 4.24 Parameters for Detailed Scheduling of Planned Orders

- With the **External Procurement** settings, you can define the purchasing processing time in workdays that procurement planners take to convert purchase requisitions to purchase orders. Substitute purchasing groups can also be maintained with this setting. The **Purchase Processing Time** field will be used if the **Purchase Group** field in the **Purchasing** view of the material master isn't maintained.
- The **Rescheduling** check is carried out during the planning run. In this setting, the **Rescheduling horizon** is maintained in workdays, and the appropriate firmed receipt elements are selected, as shown in [Figure 4.25](#). When there is a requirement, during the planning run, MRP checks in the rescheduling horizon of 30 days (as in the settings) whether any firmed receipt elements can fulfill this requirement. If so, the system will create an MRP exception message for the MRP controller to reschedule this receipt element to suit the requirement. The other settings available in this customization are **Tolerance value forward** and

Tolerance value for displacement. These fields are also maintained in workdays. Based on these tolerance values, the system won't create any rescheduling exception messages for firm receipt elements if they are too close to the requirements date.

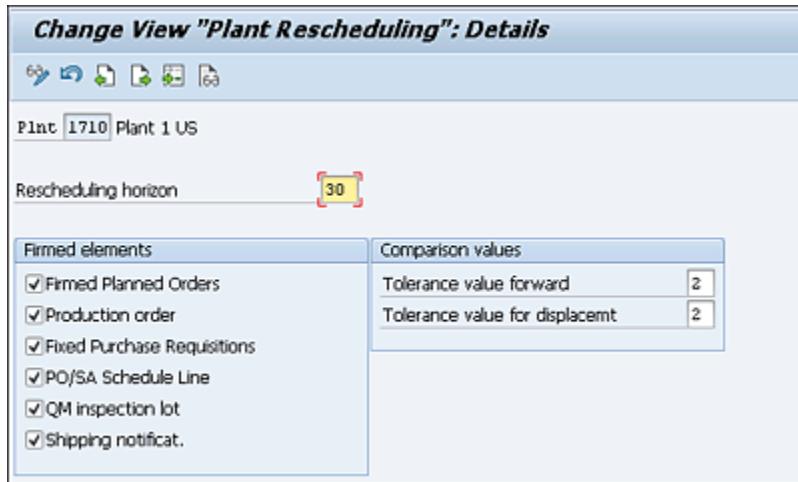


Figure 4.25 Rescheduling

- The **Available Stocks** setting defines whether the net requirements calculation of MRP run should consider the mentioned stocks as well as available stock. Based on the business requirement, you can select or deselect specific stock types; if you deselect a stock type, then it won't be considered available stock for MRP calculations. Following are the stock types:
 - Stock in transfer
 - Blocked stock
 - Restricted use-stock
- **Direct Procurement** settings, as shown in [Figure 4.26](#), can be handy when dealing with nonstock components or if a component is maintained as relevant to direct procurement via the special

procurement type in the material master. This setting influences when direct procurement is triggered, that is, either during the MRP run or while creating the production order.

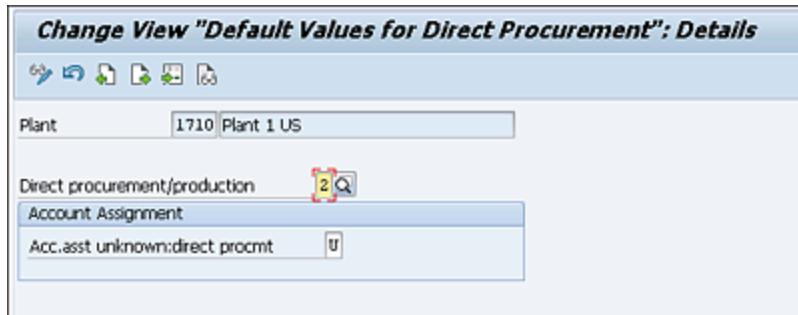


Figure 4.26 Default Values for Direct Procurement

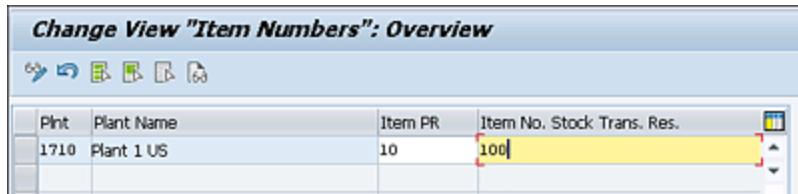
- **Error handling** is useful for overall planning run performance. This setting determines the number of purchasing proposals to not exceed per day or the maximum number of proposals per day. If MRP finds and tries to create more purchasing proposals than specified in this setting, then the MRP run will be terminated, and an appropriate exception message will be triggered. In addition, you can maintain the substitute MRP controller in case the system doesn't find the MRP controller from the material master. **MRP controller** is a mandatory field in the material master, so if an MRP controller isn't available during MRP, this is a clear case of data inconsistency. As shown in [Figure 4.27](#), the maximum number of proposals per day is maintained as **50**.

| Change View "Error Handling in the Planning Run": Overview | | | | |
|--|------------|----------------|-------|--------------------|
| Plant | Plant Name | Max. Proposals | Subs. | Controller name |
| 1710 | Plant 1 US | 50 | 001 | MRP Controller 001 |
| | | | | |

Figure 4.27 Error Handling in the Planning Run

- During the planning run, MRP creates purchase requisitions and stock transfer reservations. With the **Item Numbers** setting, you

can define line-item numbers for these two receipt elements, as shown in [Figure 4.28](#). By default, the line-item number for purchase request (Item PR) is 10 and for stock transfer reservation (Item No. Stock Trans. Res.) is 100. The system creates each element with the line-item number as specified.



| Plant | Plant Name | Item PR | Item No. Stock Trans. Res. |
|-------|------------|---------|----------------------------|
| 1710 | Plant 1 US | 10 | 100 |

Figure 4.28 Define Line-Item Numbers

- **Start in Past** allows you to set the start date in the past (see [Figure 4.29](#)). If a requirement exists, then MRP will consider this requirement date as the basic finish date and perform backward scheduling to find out the order start date. If this order start date is in the past, then it automatically switches to forward scheduling with today's date as the order start date. If you enable this setting, the system won't switch to forward scheduling to find out the basic dates, but always plans by using backward scheduling even though the basic start date is in the past.
- The **Performance** setting in this customization is related to buffering of BOMs, as shown in [Figure 4.30](#). BOMs are read for processing from the database tables, but if you enable the **Buffering** checkbox here, then instead of database tables, the

system will fetch the BOM data from the shared buffer. This will enhance system performance.

| Change View "Order Proposals in the Past": Overview | | | |
|---|------------|--------------------------|--|
| | | | |
| Plant | Name 1 | Start in Past | |
| 1710 | Plant 1 US | <input type="checkbox"/> | |

Figure 4.29 Order Proposal in the Past

| Change View "Performance: BOM Buffering in Shared Buffer": Overview | | | |
|---|--------|-----------|--|
| | | | |
| Performance: BOM Buffering in Shared Buffer | | | |
| Plant | Name 1 | Buffering | |

Figure 4.30 Performance: BOM Buffering

4.6 Carrying out Planning Run (Classic MRP)

The MRP run available in SAP ERP is also available in the SAP S/4HANA system. Transactions MD01/MD02/MD03 (MRP execution in the background) are still available and can be used in the SAP S/4HANA system also. Due to the simplifications to improve performance, effectiveness, and flexibility in SAP S/4HANA, new Transaction MD01N (MRP Live) was introduced. So, to make a distinction, when referring to an MRP run, process, or transaction codes related to the old SAP ERP system, this is called classic MRP. For all practical purposes, the new MRP is referred to as MRP Live.

Classic MRP isn't outdated; in fact, in some situations, classic MRP produces better results. In addition, there are still some restrictions with MRP Live; if these exception situations arise, MRP Live automatically switches to classic MRP and executes the planning run for those materials without any intervention from the planner/MRP controller. MRP Live is continuously evolving to close the gap with the existing exceptions and is in line with the new architecture. Therefore, no more improvements can be performed with the classic MRP transactions. We'll discuss more features of MRP Live in the next section.

[»] Note

Following are the transactions that can be used to execute classic MRP depending on the planning run scope:

- Transaction MD01: Total Planning Online
- Transaction MDBT: Total Planning – As a Background Job
- Transaction MD02: Single-Item Multilevel Planning

- Transaction MD03: Single-Item Single Level Planning
- Transaction MD43: Single-Item Interactive Planning
- Transaction MD50: Sales Order Planning Multilevel
- Transaction MD51: Project Planning Multilevel

As mentioned previously, there are various options to execute classic MRP in SAP S/4HANA, so before going into specific transactions, we'll discuss the various parameters in detail. This will form the base for different options in the classic MRP run and a good starting point for further understanding of MRP Live.

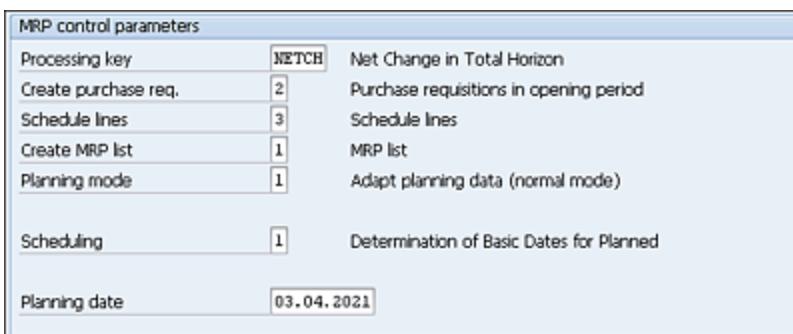


Figure 4.31 Control Parameters for Classic MRP

The various control parameters available are shown in [Figure 4.31](#) and described here:

- **Processing key** determines which materials will be planned during the planning run in SAP S/4HANA. There are two options available:
 - **NETCH (Net Change in Total Horizon)**: This is the most widely used processing key. With this key, you can plan only those materials that have undergone a planning-relevant change. For total planning, MRP will check the planning file entries and include all those materials that have the NETCH indicator

active. With this planning, the load on the system will be reduced. Generally, for the periodic MRP run in the background (daily etc.), this is the processing key used.

- **NEUPL (Regenerative Planning)**: This is used when you want to plan all the materials in the plant and is the processing key used while planning for the first time. The system won't check the planning file entries for this material; all the materials that are relevant for MRP are planned with this processing key. If there are any inconsistencies in the planning process, then it's good to have the planning run with this processing key so that all the MRP-relevant materials will be planned.
- With the creation indicators **Create purchase req.** and **Schedule Lines**, you define how these receipt elements will be created during the planning run. Both these indicators are considered only for externally procured materials. The creation indicator for purchase requisitions controls whether purchase requisitions only will be created, planned orders only in the opening period, or purchase requisitions in the opening period and planned orders after the opening period. Similar logic is used with **Scheduling Agreement – Schedule Lines** creation also. These options are defaulted from the MRP group customization. With the **Create MRP list** indicator, you define whether to create MRP lists or not, as well as the MRP list to be created during some exceptional situations.

[»] Note

For the creation indicators, there is different logic for total planning and single item planning:

- **Total planning**

The system first checks the MRP group creation indicator

parameters, and, if selected, adopts it. If not, the system considers the data entered in the initial screen of the total planning run.

- **Single item planning**

The MRP group parameters won't have any impact on the planning run; the system always adopts the settings from the initial screen of the planning run.

- **Planning mode** determines how the planning run influences the procurement elements/receipts created during the last planning run and whether the unfirmed procurement elements from the last planning run can be reused. In classic MRP, there are three options available:
 - **Adapt planning data (normal mode)**: As the name suggests, the system reuses the already existing planning proposals wherever applicable. If there is a change in the requirement quantities/dates or a BOM change, then the system only considers the material in the planning. It's recommended to use this planning mode in the daily planning run.
 - **Reexplode BOM and routing**: The system explodes the BOM and routing, even though it's not required. In this case, the system adopts the same planning proposal and explodes the BOM, and a new planned order won't be created.
 - **Delete and recreate planning data**: All the planning data (unfirmed procurement proposals) will be deleted and recreated with this setting.

Options **2 (Reexplode BOM and routing)** and **3 (Delete and recreate planning data)** aren't recommended to be used on a regular basis. Both these options will have a large impact on the

MRP run and drastically reduce system performance. Option 1 is enough for general daily planning. The planning file is a power reference for the MRP run based on the **Explode BOM** and **Reset Procurement Proposals** indicators. With planning 1, the system will reexplode the BOM or recreate procurement proposals on an as-needed basis.

- There are two options for planned order scheduling with **Scheduling** indicator. With the basic date scheduling option (**Determination of Basic Dates for Planned Orders**), the system uses the in-house production time maintained in the material master to determine the basic dates of planned orders. If you want to use lead-time scheduling (**Lead Time Scheduling** and **Capacity Planning**) so that capacity requirements will be determined for capacity leveling of planned orders, the system uses routing data and arrives at the precise dates of operations.

[»] Note

Customization changes or routing changes won't have an impact on the planning file entries and in turn on the planning run. If required, use **Planning Mode 2** or **3** in exceptional situations.

All the planning run transactions use the same control parameters, and depending on the planning run, the level and mode of planning run changes. We'll go through some of the classic MRP planning runs in the following list:

- **Total planning**

For total planning as shown in the [Figure 4.32, Scope of planning](#) is an important parameter that defines whether the planning run is to be carried out for a single plant or set of plants and MRP areas. This planning considers all the relevant materials

and plans the multilevel MRP run. For **Total planning – Online**, Transaction MD01 is used. This transaction is rarely used because you're executing the MRP at the plant or scope of planning level online, which will cause performance issues if it's used at the wrong time of the day. So, to mitigate the performance issues, the **Total Planning – As a Background Job** can be executed in the background with Transaction MDBT (with program RMMRP000), generally as a job run during the night.



Figure 4.32 Classic MRP: Total Planning Run (MD01)

While using total planning, another important parameter is **Parallel processing** with which you can execute the MRP run on several application servers or on the same server with various sessions. Parallel processing is carried out based on low-level code. If you want to execute the planning run for a specific MRP controller only, specific MRP groups, or for a specific procurement type, then you have an option to implement the user exit, which

SAP provides for this specific purpose, where you can implement your own logic. The **User exit key** and **User exit parameter** are used to select and determine the logic for selections of materials for planning.

[»] Note

Scope of planning is defined in Transaction OM0E, but this step is only required for classic MRP; MRP Live logic determines the planning sequence of plants automatically.

Parallel processing is defined in Transaction OMIQ, but this step is only required for classic MRP; the MRP Live system performs the parallel processing automatically if the server groups are defined.

- **Transaction MD03 : Single-Item Single Level Planning**

With this planning, only a single material is planned, and replenishment elements are created. If BOM components are available, then dependent requirements are created for them, but they won't be planned.

- **Transaction MD02 : Single-Item Multilevel Planning**

In this planning type, the system will plan for the material that you're planning. The system explodes the BOM, creates dependent requirements, and plans all levels of materials (multilevel) until the components are reached. With this planning, you can avoid any shortages, and the system will generate all the needed replenishment elements.

- **Transaction MD43 : Single Item Interactive Planning**

This planning can be performed interactively, and any exception messages such as rescheduling proposals can be taken care of intuitively. To save the planning run, you must click the **Planning** button. This transaction can be used for a single material or a

product group. Because there is only a single item and single level, planning for the dependent requirements created won't be planned further.

- **Transaction MD50: Sales Order Planning Multilevel/further
MD51 – Project Planning Multilevel**

If you want to plan for a specific sales order or for a project, these transactions can be used. They are multilevel, and the system will also plan for the dependent requirements. There are a few additional options available on the selection screen.

4.7 Carrying out Planning Run Using MRP Live

As discussed earlier, with MRP Live, the performance of the MRP run is drastically improved, so the total time taken to complete the MRP run in general is in minutes rather than hours (data and scenario dependent). With the performance improvement, there are various benefits; for example, if any shortage is identified, the MRP run can be executed immediately without waiting for the batch job run during the night. Because the shortages are visible up front, the overall stock keeping is reduced. Apart from the performance improvement, handling of the MRP run and analysis of MRP results are simplified with SAP Fiori apps. SAP Fiori apps bring their own advantages to business users with role-based intuitive interface, which we'll cover more in the next section.

Even though the MRP Live program can handle large sets of data and is fast, there are some restrictions. Some materials must be planned with classic MRP, and a few, for example, time-phased planning or seasonal MRP (see SAP Note 1914010, MD01N Restrictions for Planning in MRP Live on HANA), can be referred for further details on the restrictions. MRP logic can handle which materials to plan with MRP Live, classic MRP, or advanced planning (PP-DS) with the same single planning run. For materials planned on PP-DS, MRP Live checks the **Advanced planning** flag and won't plan those materials with MRP Live logic.

MRP Live can be executed in the background with program PPH_MRP_START

[+] Tip

If you want to force a material to always be planned with classic MRP, then you can use Transaction MD_FORCE_MRP_CLASSIC.

In comparison to a classic MRP run, there are many simplifications implemented with MRP Live (see [Figure 4.33](#)).

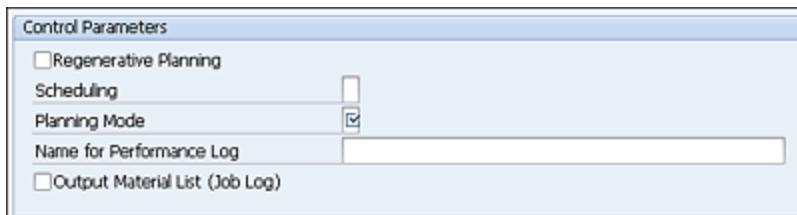


Figure 4.33 Control Parameters for MRP Live

In comparison to the classic MRP control parameters, the system always creates purchase requisitions. with MRP Live for externally procured materials. If schedule agreements are maintained for a material, then the system will always create schedule lines by default. MRP Live won't create MRP lists. So, these three indicators (**Create purchase req**, **SA Deliv. Sched. lines**, and **Create MRP list**) aren't available in the control parameters of MRP Live ([Figure 4.33](#)).

By default, MRP Live will execute processing key NETCH (Net Change Planning). If you want to use regenerative planning, then check the **Regenerative planning** flag in the control parameters. The scheduling parameters are the same as classic MRP. There is a simplification implemented for **Planning Mode**, and the **Reexplode BOM and Routing** option is removed, so there are only two options available for MRP Live:

- **Planning Mode 1 (Adapt Planning Data):** The system will adopt the planning data (unfirmed receipts) if there are no changes to requirements. If there is any change, the system will delete the planning data and recreate it altogether.
- **Planning Mode 3 (Delete and Recreate Planning Data):** The system deletes and recreates all the unfirmed replenishment proposals.

Output Material List (Job Log) can be checked if you want to have the material list after the background MRP Live run in the spool list.

MRP Live run can be performed with both SAP GUI and with SAP Fiori apps. MRP Live execution is flexible and has many options in the same transaction code. The MRP Live selection screen is shown in [Figure 4.34](#).

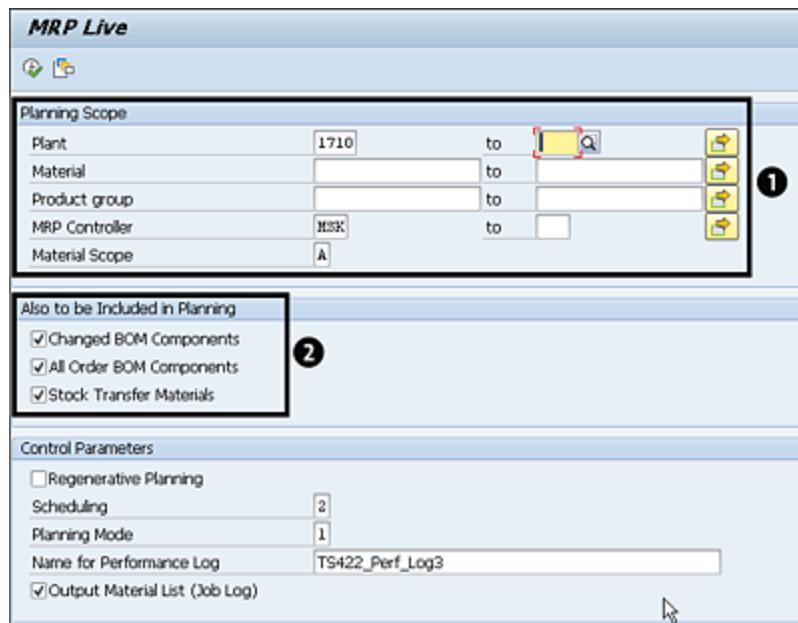


Figure 4.34 MRP Live Selection Screen

With MRP Live, there is only one transaction code for executing the planning run: Transaction MD01N. This transaction is highly flexible and eliminates the need for many transaction codes for a planning

run unlike classic MRP. Some practical considerations in MRP Live are as follows:

- **Planning Scope**

As shown in ①, a flexible planning scope is available. Scope of planning isn't required to be configured for MRP Live. Based on the selection criteria, the system intuitively plans the sequence of materials based on the receiving plant and supplier plant, if materials are selected with the special procurement key and stock transfer requirement.

In the planning scope, at least one out of the five fields (**Plant**, **Material**, **Product group**, **MRP Controller**, and **Material Scope**) is required to be filled—that's the only requirement. Otherwise, various permutations and combinations in the selection can be adopted. For example, if the **Plant** field isn't filled, the system will plan for all the plants; if the **Material** field isn't filled, the system will plan for all the materials, and so on.

Although MRP can be executed for multiple plants, the MRP run will be separate internally for each plant. In multiplant MRP Live runs, the system won't combine any requirements or receipts across plants.

MRP Live can plan MRP, MPS, or a combination of both MRP and MRS materials together.

- **Also to be Included in Planning**

This section is mainly for selecting multilevel BOM explosions and planning.

- As shown in ②, if you want to include components in the MRP Live run, select these checkboxes. If you select **Changed BOM Components**, the system will include all the BOM components related to the materials selected under the planning scope.

Therefore, for a daily MRP Live run, selection of this option is enough.

- By selecting **All Order BOM Components**, the system will include all the components, irrespective of changes to BOM components.
 - If you select **Stock Transfer Materials**, the system will include those materials and plants in the MRP run where MRP generates stock transfer requirements from the supplier plant. This is based on having appropriate authorizations for planning in the supplying plant.

After the planning run is complete, the system displays the performance log. You can also review MRP Live runs with report MD_MRP_PERFLOG. If you've included a name in the **Name for Performance Log** field in the selection screen of Transaction MD01N, then that name will be saved in the performance log. Specific performance log details are shown in [Figure 4.35](#).

Figure 4.35 MRP Live Performance Log

You can schedule MRP Live with the Schedule MRP Runs app tile in SAP Fiori. MRP Live runs can also be started with various monitor apps:

- Monitor Material Coverage – Net Segments
 - Manage Material Coverage
 - Manage External Requirements

- Manage Internal Requirements
- Manage Production or Process Orders

[»] Note

When you use any of the monitor apps for the MRP run, the system will always plan the material with single-item/single-level planning. The settings are hard-coded in the planning run with net change planning always using **Planning Mode 1 (Adapt Planning Data)** and **Basic Date Scheduling**. Components won't be selected, and both MRP and MPS materials will be selected.

4.8 Evaluating MRP Results

The main aim of MRP is to guarantee material availability. While resolving issues during an MRP run, MRP generates exception messages for resolution by manual intervention. In general, MRP controllers are authorized to check and resolve these issues.

In this section, we will go into details about some of the important MRP transactions and SAP Fiori apps used for evaluating MRP results.

4.8.1 Stock/Requirements List

Stock/requirements list is the most widely used MRP evaluation transaction for MRP controllers and other alike. This is Transaction MD04, which is available for both classic MRP and MRP Live. You can access the stock/requirements list in SAP Fiori also, as shown in [Figure 4.36](#), by typing “MD04” in the search field or searching for “Monitor Stock/Requirements List.” The stock requirements list can be accessed for an individual material with Transaction MD04, or you can access for a wider selection of materials with the Transaction MD07.

The stock/requirements list shows the current and most updated requirements, receipts, and stock situations at the time of accessing the transaction. When there is an MRP-relevant change, the system updates the stock/requirements list. This change can be viewed by accessing the list or by refreshing the screen. For this reason, it is also called a *dynamic list*. The list is arranged in columns with the planning date. This list also includes MRP elements (planned orders, production orders, PIRs, reservations, sales orders, etc.) and

corresponding MRP elements data (such as order number, reservation number, PIR type, etc.), rescheduling date, exception message key, receipt/requirement quantity, planned warehouse stock (available quantity), and various other details. You can also add further columns by implementing a BAdI.

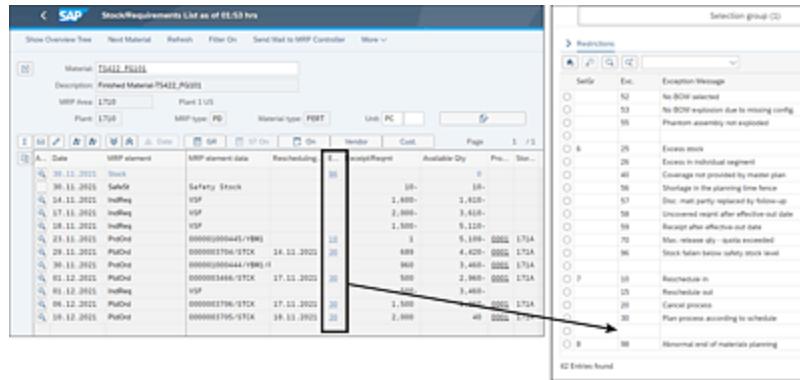


Figure 4.36 Stock/Requirements List – Individual Access

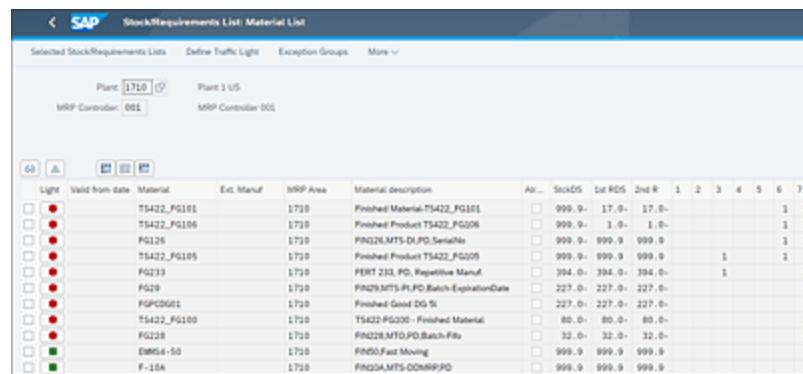
The system generates the exception messages, and the message key is displayed in the **Exception Message** column. By double clicking on the exception message number, you can see the exception message description at the bottom of the screen. The exception messages are grouped into various selection groups. The most common exception messages are rescheduling messages such as rescheduling in or rescheduling out. If there is a shortage, MRP tries to create a replenishment proposal or changes existing unfirmed proposal or receipt. If there is a firmed receipt (for example, a production order or a firmed planned order), then the system cannot change this planning element. The system then suggests to either reschedule in (**Exception Message – 10**) or reschedule out (**Exception Message – 15**), creates appropriate exception, and proposes the date, which is visible in the rescheduling date column.

With display filter, you can filter the view to show only certain options, such as receipts or requirements and stock. You have

options and groupings to enhance and optimize the stock/requirements list to suit the individual needs of the MRP controllers and users for evaluation of MRP results. By accessing the individual MRP element, you can either display the MRP element or make changes to it.

There are also other options for evaluating MRP results:

- If you want to access the stock/requirements list for a wider selection of materials, then you can access Transaction MD07, which displays the *collective access* of stock/requirements, as shown in [Figure 4.37](#). You have other selection options, such as MRP controller, product group, vendor, and production line. Further selections, like material type and procurement type, are also available when filtering the list. The range of coverage data fields, such as **Days' Supply**, **First Receipt Days' Supply**, and **Second Receipt Days' Supply** are important, as they are used in defining the traffic lights.



The screenshot shows the SAP Stock & Requirements List - Material List interface. At the top, there are navigation links: Selected Stock/Requirements Lists, Define Traffic Light, Exception Groups, and More. Below that, there are filters: Plant (1710), MRP Controller (001), and MRP Controller (005). The main area is a grid table with columns: Light, Valid from date, Material, Ext. Manuf, MRP-Area, Material description, Alt..., StockDS, 1st RDS, 2nd R, 1, 2, 3, 4, 5, 6, 7. The data rows show various material entries with their descriptions and supply status across different areas and dates.

| Light | Valid from date | Material | Ext. Manuf | MRP-Area | Material description | Alt... | StockDS | 1st RDS | 2nd R | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------------------------|-----------------|-------------|------------|----------|--------------------------------------|--------|--------------------------|---------|--------|--------|---|---|---|---|---|---|
| ● | | T5422_PG101 | | 1710 | Finished Material-T5422_PG101 | | <input type="checkbox"/> | 999.9- | 17.0- | 17.0- | | | | 1 | 5 | |
| ● | | T5422_PG106 | | 1710 | Finished Product T5422_PG206 | | <input type="checkbox"/> | 999.9- | 1.0- | 1.0- | | | 1 | 1 | | |
| ● | | PG126 | | 1710 | FIN212.MTS-DI.PD.SerialNr | | <input type="checkbox"/> | 999.9- | 999.9 | 999.9 | | | 1 | 3 | | |
| ● | | T5422_PG105 | | 1710 | Finished Product T5422_PG205 | | <input type="checkbox"/> | 999.9- | 999.9 | 999.9 | 1 | | | 1 | | |
| ● | | PG233 | | 1710 | FERT 233. PD. Repetitive Manuf. | | <input type="checkbox"/> | 394.0- | 394.0- | 394.0- | | 1 | | 4 | | |
| ● | | PG29 | | 1710 | FIN29.MTS-PL.PD.Batch-ExpirationDate | | <input type="checkbox"/> | 227.0- | 227.0- | 227.0- | | | 1 | | | |
| ● | | PGC0601 | | 1710 | Finished Good DG Si | | <input type="checkbox"/> | 227.0- | 227.0- | 227.0- | | | 1 | | | |
| ● | | T5422_PG100 | | 1710 | T5422_PG200 - Finished Material | | <input type="checkbox"/> | 80.0- | 80.0- | 80.0- | | | 1 | | | |
| ● | | PG228 | | 1710 | FIN228.MTS.PD.Batch.Fita | | <input type="checkbox"/> | 32.0- | 32.0- | 32.0- | | 1 | | | | |
| ■ | | EM054-50 | | 1710 | Fin050.Fast Moving | | <input type="checkbox"/> | 999.9 | 999.9 | 999.9 | | | | | | |
| ■ | | F-1EA | | 1710 | FIN20A.MTS-DO.MRP.PD | | <input type="checkbox"/> | 999.9 | 999.9 | 999.9 | | | | | | |

Figure 4.37 Stock/Requirements List – Collective Access

- Another list that can be used for evaluation is the MRP list. This can be accessed individually or collectively. Unlike the stock/requirements list, the MRP list is a static report that shows the results from the last MRP run. The output of the report is same until the next MRP run. Individual access to the MRP list can be

executed with Transaction MD05. The collective list can be executed with Transaction MD06.

The MRP list is obsolete in the case of MRP Live, as MRP Live will not generate MRP lists. If you are using classic MRP for some of the materials, then you can use MRP lists for them in SAP S/4HANA.

4.8.2 SAP Fiori Apps for Evaluation of MRP

SAP Fiori apps provides real-time stock visibility. MRP controllers can personalize their reports based on their materials and shortages. The system proposes an available solution if a shortage is detected. You can also check and evaluate the solution before it is applied.

SAP standard customizations are available with the “monitor” and “manage” apps for MRP evaluation and can be accessed with the customization menu path **Production • Material Requirements Planning • Apps for Material Requirements Planning • General Settings**, as shown in [Figure 4.38](#). The **Define Material Shortage Profile** view shows both the supply profile and demand profile.

The Monitor and Manage Material Coverage – Net and Individual Segments app is the most widely used app by MRP controllers. An overview of this app is shown in [Figure 4.39](#). With this app, you can access the real time shortage of the materials. Using the adjustments to the time horizon, you can restrict the number of materials displayed. You can use the **Time Til Shortage** filter to

check the coverage within a specified timeframe. This app can be used for MTS, MTO, and ATO scenarios.

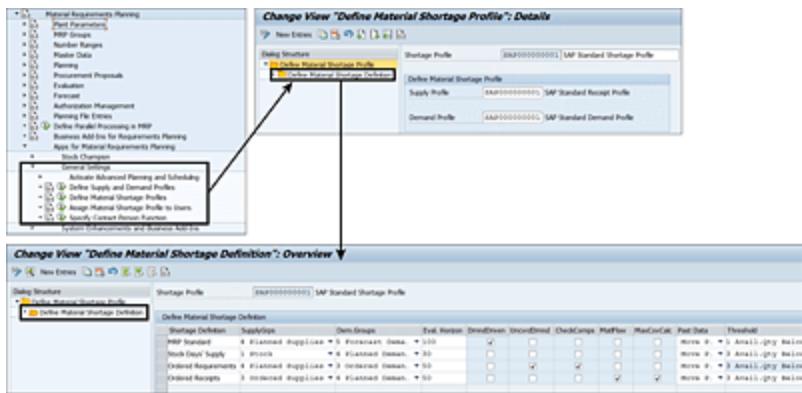


Figure 4.38 Material Shortage Profile and Definition

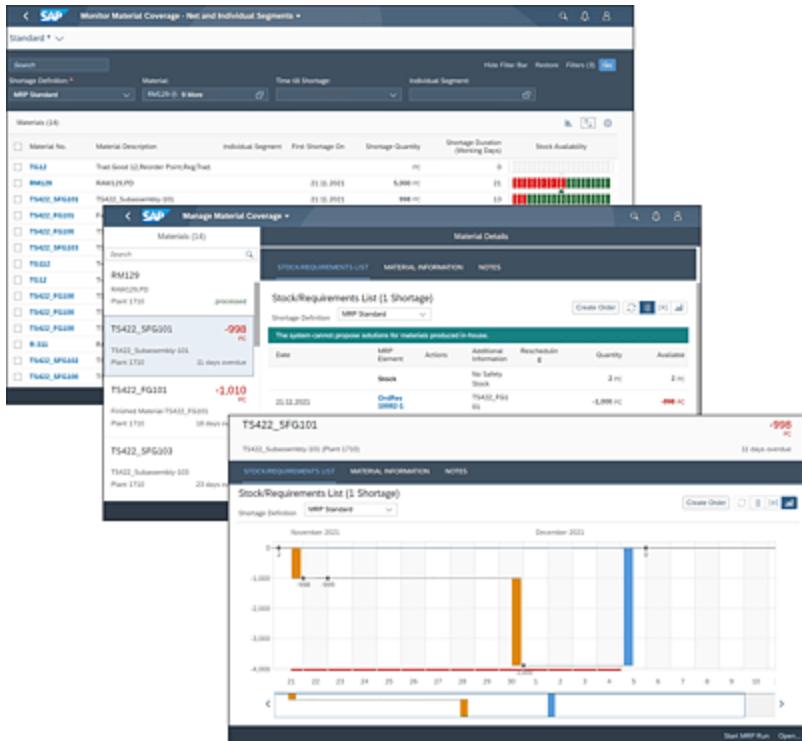


Figure 4.39 Monitor and Manage Material Coverage – Net and Individual Segments App

One or more materials can be selected and navigated to the Manage Material Coverage – Net and Individual Segments app. With this view, you can access the stock requirement list, access material information, or add a material note in the app. You can also access

the chart view. By accessing the chart view, you can view a graphic of the stock situation for next 21 days. The system will propose best solution options only for externally procured materials. (This feature is not available for in-house produced materials.) In this app, directly you can edit the procurement proposals and execute the MRP. Internal MRP control parameters are hardcoded when you execute from this app.

Based on the specific requirements, there are other MRP apps available:

- Monitor External Requirements
- Manage External Requirements
- Monitor Internal Requirements
- Manage Internal Requirements

These apps function in predominantly the same way as the Monitor and Manage Material Coverage – Net and Individual Segments app.

[+] Tip

If the solutions proposed by the system are not feasible, you can click on the **Accept Shortage** button. With this button, the shortage will not be considered for this material and the material will go to the bottom of the evaluation list.

4.9 Important Terminology

In this chapter, the following terminology was used:

- **Classic MRP**

MRP is written in ABAP, which is available in SAP ERP, and all the different transactions available are known as classic MRP. These transactions are still available in SAP S/4HANA.

- **Dependent requirements**

These requirements are caused by higher-level materials. During the planning for production, dependent requirements are created for all the components necessary for production of higher-level material.

- **Exception messages**

During the planning process, if any situation arises that should be brought to the attention of the MRP controller, the system generates messages called exception messages.

- **GR processing time**

This is the time required after production and goods receipt when the material is available for consumption. This is maintained in working days.

- **In-house production time**

This is the time required to produce a material in-house in the plant. It's represented in number of days.

- **MRP area**

The MRP area is an organizational unit for which a separate MRP run can be performed.

- **MRP controller**

This is the person or group of persons responsible for planning

materials and resolving any planning-related issue or handling of exceptions.

- **MRP group**

This is a key that represents a grouping of materials with special control parameters for MRP.

- **MRP Live**

MRP Live is the new MRP available in SAP S/4HANA, which is written on SAP HANA to take advantage of the various capabilities to drastically improve performance.

- **MRP procedure**

The MRP procedure determines how a material is planned by MRP. Some of the examples of MRP procedures are MRP, reorder point planning, MPS, and demand-driven replenishment.

- **MRP type**

The MRP type determines how a material is planned. Each MRP type is to be assigned to an MRP procedure in customization and, in turn, assigned to the material master.

- **Net requirements calculation**

MRP is a big calculator, which runs a calculation to check whether the requirements can be covered by the existing stock and fixed receipts

- **Opening period**

This is the number of working days between order creation and planned start date. During this time, the MRP controller can convert the planned order to a production order or purchase requisition. For external procurement, MRP Live always generates purchase requisitions.

- **Planning file**

This is a special table where planning relevancy, low-level code,

and so on of a material are captured. Whenever a material is set with a valid MRP type, an entry is generated in the planning file. Whenever there is a planning-relevant change to a material, then further entries are made into this file. Checking the planning entries is the first step in an MRP run.

- **Plant parameters**

These are MRP-relevant customizations where many parameters are maintained in one transaction. This forms the basis for default planning parameters for a plant.

- **Procurement type**

This is a key in the material master that determines whether a material is procured externally, produced in-house, or both.

- **Scheduling**

When to start procuring or producing a material is determined by scheduling with scheduling start and finish dates of orders.

- **Source of supply**

Source of supply can be in-house production or external procurement, and one of the tasks of MRP is to determine the source of supply. Many simplifications have been introduced in this area in SAP S/4HANA.

- **Stock/Requirements list**

This list presents up-to-date (time) information on stock, requirements, and receipts situation of a material at the plant/MRP area level.

- **Stock transport orders**

With this type of purchase order, a plant can request another plant in the same enterprise to supply materials.

4.10 Practice Questions

These questions will help you evaluate your understanding of the topics covered in this chapter. They are similar in nature to those on the certification examination. Although none of these questions will be found in the exam itself, they will allow you to review your knowledge of the subject. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers and only correct answers to receive credit for the question.

1. Which statements are correct for MRP Live? (There are two correct answers.)
 - A.** MRP Live creates MRP lists.
 - B.** Project planning and make-to-order planning for sales orders aren't optimized for MRP Live.
 - C.** All materials for all the plants can be planned.
 - D.** SAP S/4HANA simplifications eliminated planning file entries, so they aren't relevant for MRP Live.
2. Which statements are correct for an MRP Live planning run?
 - A.** MRP Live executes net change planning when regenerative planning option isn't selected.
 - B.** With simplifications to SAP S/4HANA, in a regenerative planning run, MRP plans only the materials that have undergone planning-relevant changes.
 - C.** Stock net-off across plants is one of the benefits of an MRP Live run.
 - D.** Unlike a classic MRP run, an MRP Live run won't store the information related to planned materials and messages.

3. When you execute an MRP Live run from various MRP monitoring apps, which of the following statements are correct? (There are two correct answers.)
- A.** MRP will always plan materials with single-item/single-level planning.
 - B.** Net change planning is executed.
 - C.** Regenerative planning is always used to make sure that the material is always planned.
 - D.** Only MRP materials are considered; MPS materials are out of scope with monitoring apps.
4. Which are the possible restrictions of MRP Live? (There are two correct answers.)
- A.** Production version only considers the first BOM alternatives for planning in MRP Live on SAP HANA.
 - B.** Time-phased planning isn't yet supported in MRP Live on SAP HANA.
 - C.** Configurable materials aren't supported in MRP Live on SAP HANA.
 - D.** Using the **Advanced planning** flag enables select materials in embedded PP-DS to be treated separately in MRP Live on SAP HANA.
5. True or False: If you want to force certain materials to be planned with classic MRP, then use Transaction MD_FORCE_MRP_CLASSIC.
- A.** True
 - B.** False
6. True or False: The planning run always considers the sequence determined by low-level codes. The system determines which

materials can be planned with MRP Live for the first low-level code and plans them.

- A.** True
- B.** False

7. In comparison between classic MRP and MRP Live, which planning mode is removed in MRP Live?

- A. Adapt Planning Data (Normal Mode)**
- B. Reexplode BOM and Routing**
- C. Delete and Recreate Planning Data**

4.11 Practice Answers and Explanations

1. Correct answers: **B and C**

MRP Live doesn't create MRP lists; it's not required to have outdated MRP lists because the MRP apps determine materials with shortages in real time. A separate planning run isn't needed for project planning with Transaction MD51 and make-to-order planning with Transaction MD51. If needed, the classic MRP transactions are still available, and they can be used. The advantage with MRP Live is the flexible planning scope. A material in all the plants can be planned, as MRP Live determines the sequence in which a material is to be planned across many plants.

2. Correct answer: **A**

By default, MRP Live will consider net change planning, where all the materials have undergone planning-relevant changes. If you select the regenerative planning run, then MRP Live will consider all the selected materials whether they have undergone any change relevant to planning or not. Even though a single material can be planned for all the plants in the same planning run, stock net-off between the plants isn't a capability of MRP Live. You have the option to have a log of planned materials and messages with an MRP Live run. The system generates a spool list

3. Correct answers: **A and B**

When you use any of the monitor apps for an MRP run, the system will always plan the material with single-item/single-level planning. The settings are hard-coded in the planning run by

always using **Net Change Planning with Planning Mode 1 (Adapt Planning Data)** and **Basic Date Scheduling**.

Components won't be selected, and both MRP and MPS materials will be selected.

4. Correct answers: **B and C**

In SAP S/4HANA, the production version determines the BOM. You can create multiple production versions based on a BOM alternative. With embedded PP-DS, advanced planning materials don't need to be handled separately in MRP Live, as they are planned with advanced planning. Configurable materials and time-phased planning aren't yet supported in MRP Live on SAP HANA; they are planned using classic MRP.

5. Correct answer: **A**

There are some restrictions with MRP Live. If you already know that due to special planning situations some of the materials are always planned with classic MRP, then use Transaction MD_FORCE_MRP_CLASSIC.

6. Correct answer: **A**

The statement is correct. In continuation of the statement, as a second step, the system determines which materials have the same low-level code with MRP Live and immediately switches to classic MRP.

7. Correct answer: **B**

The difference between classic MRP and MRP Live with reference to planning mode is the **Reexplode BOM and Routing** setting, which isn't available in MRP Live. In classic MRP, with this setting, the system explodes the BOM and routing, even though it's not required. In this case, the system

adopts the same planning proposal, explodes the BOM, and a new planned order won't be created.

4.12 Test Takeaway

This chapter described the various planning procedures available in SAP S/4HANA and the differences between them. You should be able to explain the one MRP run, which includes classic MRP, MRP Live, and PP-DS. You should be familiar with and be able to explain the logic built in for planning process steps, the simplifications introduced (e.g., determination of source of supply, MRP areas, planning file entries, etc.). You should be able to describe the execution of MRP runs, both classic MRP and MRP Live, and enumerate and evaluate the planning results with SAP Fiori apps.

4.13 Summary

To take advantage of SAP HANA features, SAP S/4HANA is built for faster MRP execution runs. We discussed the planning process steps that will be executed internally and how the MRP logic is written such that these steps will happen iteratively to find the solution to cover the actual or forecasted requirements. With an MRP Live run, the system will identify and plan the materials appropriately with classic MRP, with advanced planning with PP-DS, or with MRP Live in SAP HANA. This happens without any user intervention. In fact, end users won't recognize any difference in the output. We discussed the various planning parameters needed for MRP execution. We covered the various tools and SAP Fiori apps available for evaluation of the planning results so you can take appropriate actions to fulfill various requirements. The output of the MRP run that is relevant for in-house production is the planned order. In the next chapter, we'll discuss discrete manufacturing.

5 Production Orders

Techniques You'll Master

- Structure and overview of production orders
- Configuration related to production orders
- Master data relevant for production orders
- Steps in production order preparation
- Production order execution, including planned and unplanned goods issue and good receipt posting
- Various confirmation possibilities
- Production order settlement and completion
- Production order statuses, their importance, and their influence on process steps
- Archive and deletion of production orders

In the previous chapter, we discussed the output of the MRP Live run as planned orders. The next logical step in the production planning process is to convert/create and execute the production orders, perform order settlement, and finally archive and delete the orders. Many of the other production process steps, intricate details, and customization settings are covered in this chapter.

Real-World Scenario

As a consultant, you should understand the client business processes and evaluate if the processes can be mapped to

discrete manufacturing. When you're certain that the production order scenarios will be implemented, then you need to detail the system settings required to map the business processes into the SAP S/4HANA system. In general, for a given business process, there will be more than one way to map the process in SAP S/4HANA, so the consultant is responsible for adopting the best fitting standard SAP solution. To justify the expectations, the consultant should have a thorough understanding of the standard available options in SAP S/4HANA, including the influence of master data on the production process, various profiles, customizations settings to map the process, and various options to manage the end-to-end process in SAP S/4HANA. SAP S/4HANA production planning and manufacturing is tightly integrated with other logistics and management accounting modules, so having an understanding of these integrations will also be helpful.

5.1 Objectives of This Portion of the Test

The purpose of this portion of the certification exam is to test your knowledge in production order management and execution steps, which includes configuration as follows:

- Various master data objects and their interdependencies, including how they are selected during creation of production orders
- Structural elements and details of a production order
- Scheduling and availability checks
- Releasing production orders
- Printing of shop floor papers

- Material staging and goods issue (GI) of components for production orders
- Various options available for confirmations
- Goods receipt (GR) posting
- Planned cost, actual cost, order settlement, and completion
- Archiving and deleting production orders

[»] Note

The production orders in SAP S/4HANA topic makes up > 12% of the total exam.

5.2 Process Overview

Production orders specify what to produce, when to produce by using what resources, and how much it costs to produce the material. [Figure 5.1](#) specifies the process flow of production-order-specific manufacturing, which is also known as discrete manufacturing. The production orders come under the shop floor control subcomponent of production planning in SAP S/4HANA. As discussed in the previous chapters, the first step in the manufacturing process is to have customer demand or a reliable forecast to check the components and other resources for availability to start the production process. The output of the planning process is the planned orders; the planned orders can also be created interactively. Production orders are created by converting the planned orders (production orders can also be created interactively). During the production order creation, the master data is selected based on the production version. The bill of materials (BOM) is copied from the planned orders or exploded while creating the production order. Reservations are generated for the components held in stock. The order is scheduled, and capacity requirements are generated for the work centers. The next step is to check the availability of resources, which includes components, production resource tools (PRTs), and work center capacities. Planned costs are calculated at this stage as well.

The actual production execution process can start when the production order is released. After the release only, all the production execution steps commence. Production order papers/shop floor papers are printed, staging is started for all the needed components, and the components are consumed for the production order. To have the transparency of production progress and control, confirmations

must be processed accurately and promptly. With confirmations, automatic goods movements (backflush of components and automatic GR) are also processed. At the end of the production process, the produced goods are placed in the warehouse or sent for subsequent processing for a higher assembly, which performs the GR against the production order.

Work in process (WIP) calculation, variance calculation, and order settlement are related to management accounting steps performed periodically. After all the processes are completed for the production orders, they can be archived and deleted to free up database space.

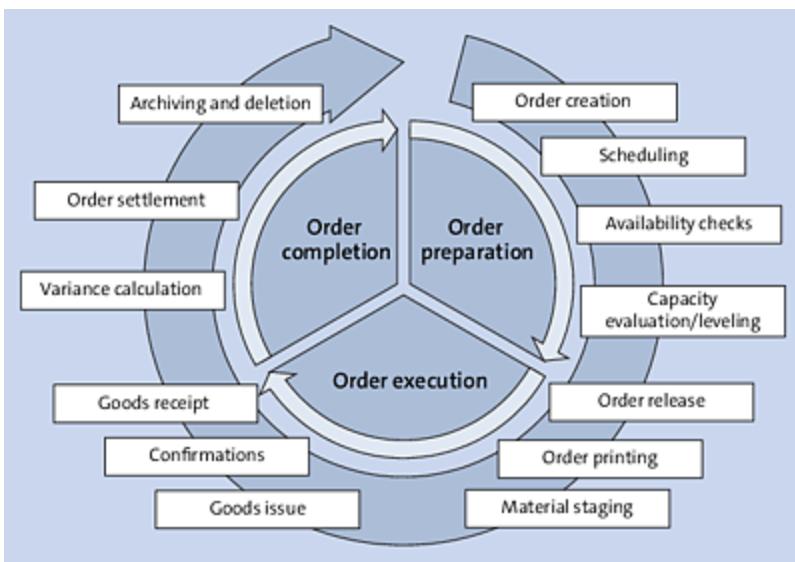


Figure 5.1 Production Orders: Process Flow

The production order comprises the following:

- **Header data**

The initial screen for the header data of the production order is

shown in [Figure 5.2](#).

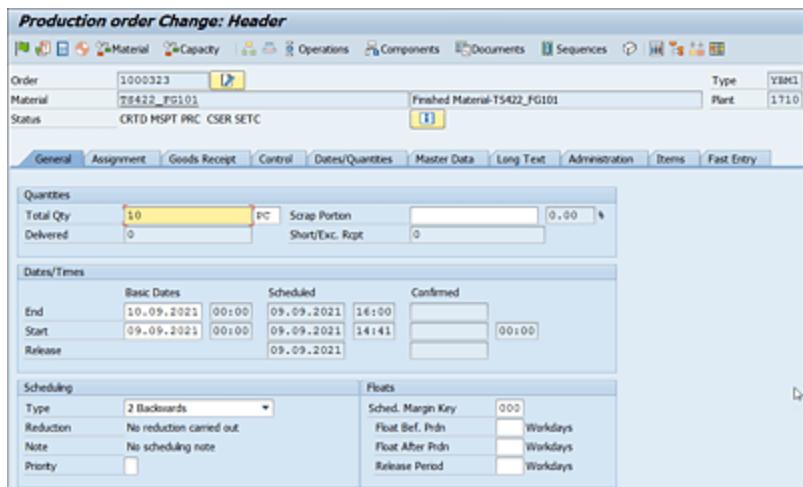


Figure 5.2 Production Order: Header Data

The header data includes the order number, plant, order type, material to be produced, and data related to the entire order. The header data is divided into various tab pages. The **General** data contains information on the quantity, the scrap quantity expected in the order, the basic dates, the scheduled dates from finite scheduling, scheduling margin key information, and the floats. In the **Assignments** tab, the MRP controller, production supervisor, profit center, and other assignments-related information is available. The **Goods Receipt** tab comprises information related to the stock type when the final GR happens, such as whether the GR for header material is valued or nonvaluated, tolerances (under delivery/overdelivery/unlimited), and the production storage location where the GR will be posted. The **Control** tab contains the information related to costing, scheduling (creation of capacity requirements, breaks, and automatic scheduling in the event of any changes relevant to scheduling), production scheduling profile, and serial number profile. The **Dates/Quantities** tab contains information related to planned and actual dates and quantities. Production version, routing, and BOM information is

available in the **Master Data** tab. You can also trigger the **Read Master Data** function from this tab.

- **Operation data**

The **Operation Overview** screen lists the production steps required to produce the product. The operations are copied into the production order from the routing. The scheduled operation details along with the operation number, work center, control key, and status of the operation are displayed in this screen. You can navigate to the **Operation - Details** screen by double-clicking on the operation number, as shown in [Figure 5.3](#).

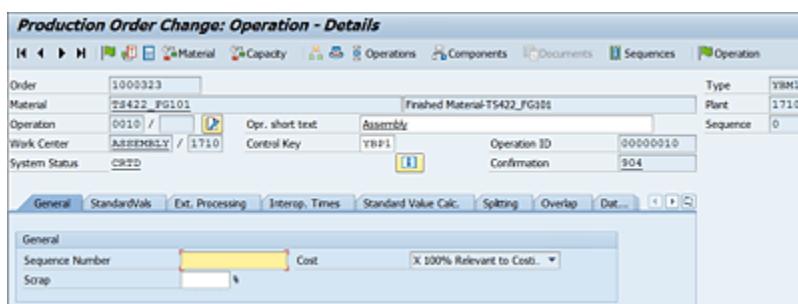


Figure 5.3 Production Order: Operation Data

Some of the important tabs in the **Operation - Details** screen are as follows: The **General** tab contains information on scrap percentage, shop floor papers to be printed, HR data, setup data, and costing relevancy information. The **StandardVals** tab includes information on the default values copied from the routing and the values corresponding to the operation quantity. The **Ext. Processing** tab contains information on the externally processed operations, that is, subcontracting. The control key determines if an operation is processed externally or internally. In this view, the purchasing-relevant data is captured, such as purchasing info records. The **Interop. times** tab comprises information on transportation time, that is, the times that influence outside the execution time, such as wait time, queue time, move time, and

reduction strategy. The **Splitting** tab covers how and when an operation is split during the scheduling. The **Overlapping** tab addresses whether overlapping is allowed, and, if so, what the overlapping time will be during scheduling. This is considered only if the operation control key considers scheduling. The **Dates/Times** tab contains the results of scheduling the operation. The information on earliest dates, latest dates, and duration of the operation segments (setup time, processing time, teardown time, and wait time) are calculated.

[»] Note

The system determines the earliest dates and times by considering the minimum queue and wait time. For the latest dates and times, the system considers normal queue and wait times.

In the other tab pages, confirmed quantities, activities, and actual processing dates are captured.

- **Component data**

From the production order header data screen, you can navigate to the **Component Overview** screen. BOM data will be read by the system to copy the components into the production order. These components will be assigned to an operation in the production order. If the components are already assigned to an operation in the routing, then the same relationship will also continue in the production order. The unassigned components are automatically assigned to the first operation in the production order. You can assign the components from one operation to another operation. One limitation is that it's not possible to assign partial quantities of a component to an operation. [Figure 5.4](#)

shows the **Component Overview** screen and detailed information of a component.

In the **General Data** tab of the component details screen, you can find the component assignment to the operation and reservation number. This is apart from the information related to the component quantity, storage location, and GI movement type, as well as general indicators such as backflush relevant, bulk material, costing relevancy, and various others. If the component is a nonstock material, then the purchasing information is captured in the **Purch. Data** tab. For these components, purchase requisitions are created automatically.

| Item | Component | Description | Reqmt Qty | U... | I... | Op... | Seq... | Point | Status | Reqmt |
|------|--------------|-----------------------|-----------|------|------|-------|--------|-------|--------|-------|
| 0010 | TS422_SF0101 | TS422_Subassembly-101 | 10 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0020 | TS422_SF0102 | TS422_Subassembly-102 | 10 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0030 | TS422_SF0103 | TS422_Subassembly-103 | 10 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0040 | KHL129 | RAWI29.PD | 50 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0050 | K-311 | RAWI11.PD | 50 | PC | L | 0010 | 0 | 1710 | 171C | |

| | | | | | | | | | | |
|------------------------|---------------------------------|-----------------------|-----------|------|------|-------|--------|-------|--------|-------|
| Order: 1000323 | Material: TS422_SF0101 | Type: YBM1 | | | | | | | | |
| Material: TS422_SF0101 | Finished Material: TS422_SF0101 | Plant: 1710 | | | | | | | | |
| Component Overview | | | | | | | | | | |
| Item | Component | Description | Reqmt Qty | U... | I... | Op... | Seq... | Point | Status | Reqmt |
| 0010 | TS422_SF0101 | TS422_Subassembly-101 | 10 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0020 | TS422_SF0102 | TS422_Subassembly-102 | 10 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0030 | TS422_SF0103 | TS422_Subassembly-103 | 10 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0040 | KHL129 | RAWI29.PD | 50 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0050 | K-311 | RAWI11.PD | 50 | PC | L | 0010 | 0 | 1710 | 171C | |

Figure 5.4 Production Order: Component Data

In addition, for the external processing, the purchase requisitions are created automatically.

- **Read master data**

After the production order is created, then the master data (BOM

components and operations from the routing) is copied to the production order with reference to the production version. After the creation of the production order, any changes to the master data aren't automatically copied to the production order. In these circumstances, it's advisable to read the master data. To do so, from the production order header data view in change mode, select **Functions • Read PP Master Data**. If you're accessing the production order from the SAP Fiori app, then select **More • Functions • Read PP Master Data**. You can also access the **Read Master Data** option from the **Master Data** tab of the production order header. After the master data is read, the components and operations in the production are deleted, and based on the selection, they are recopied to the production order. Note, however, that any manual changes to components or operations will be lost. If the production process has started, you can't read the master data.

You also can't read master data if the order or operation is partially or fully confirmed, partially or fully delivered, components are fully or partially goods issued, or purchase documents and inspection lots exist.

- **Check the statuses**

The main advantage to using production orders is having status indicators at the order level and operation level. The status documents the current processing of the production order. If any business transaction occurs, the system documents and updates the statuses. These business transactions can include creating or releasing production orders, posting goods movements, performing confirmation, and so on. The status updates can be at the header level and operation level, as shown in [Figure 5.5](#). The system displays the status as a four-character code or 30-

character text (e.g., the status of CRTD is the code for created status).



Figure 5.5 Production Order: Statuses at Header Level

There is a distinction between system status and user status. The system status, as the name indicates, is the status set by the system based on fixed rules. On the other hand, user status is defined by the user to obtain additional information on the production order. Based on the business requirement, the user status can be defined with Transaction BS02, and the created status profile can be assigned in the order type customization, as mentioned in [Section 5.4.1](#). The result of the customization is shown in the production order Status view (see [Figure 5.6](#)).

[+] Tip

With the user status, you can allow or forbid certain transactions if

a status is active.

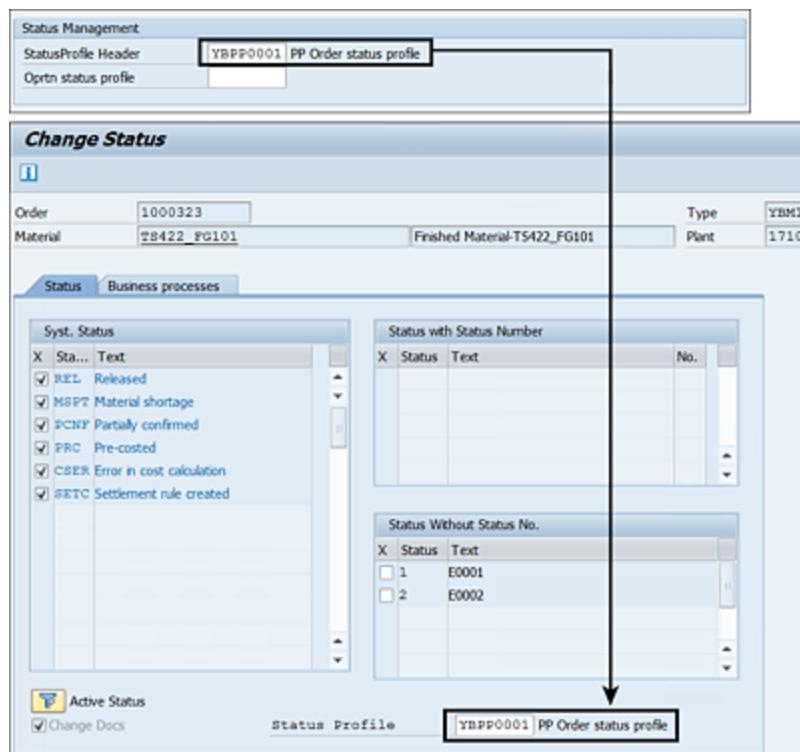


Figure 5.6 Production Order: System Status and User Status

5.3 Master Data

In this section, we'll cover important master data objects and relevant field-level information specific to discrete manufacturing.

[»] Note

The generic information on production planning master data is described in [Chapter 2](#).

To enable discrete manufacturing for a material, it's mandatory to have the **Work scheduling** view enabled. The **Work scheduling** view contains important information for production scheduling data such as production scheduler, production scheduling profile, serial number, and batch-management-related information. Lot-size-dependent and lot-size-independent information of material is also shown here (see [Figure 5.7](#)).

The screenshot shows the SAP Material Master: Work Scheduling View. At the top, there are tabs for Extended SPP, Work scheduling, Plant data / stor. 1, Plant data / stor. 2, Accounting 1, and Acc... The 'Work scheduling' tab is active. Below the tabs, there are three input fields: Material (T8422_PG101), Descr. (Planning Material), and Plant (1710 Plant 1 US). To the right of these fields are three icons: a blue square with a white 'I', a yellow square with a white 'd', and a green square with a white 'u'. The main area is divided into several sections:

- General Data:** Contains fields for Base Unit of Measure (PC), Piece, Unit of issue, P-S matl status, Valid From, Prod. unit (VY1), Prod. Supervisor (YB1), MTS DI - Valu., Prod. Stor.Loc. (171A), Prod. Sched. Profile (YB0001), MTS DI Valua., Mat. Grouping, Serial No. Profile (VBP1), SerLevel, Overall profile, Critical Part, Insp.stock, Batch entry, Batch mgmt, Batch rec. req., and Batch mgmt(Plnt).
- Tolerance data:** Underely tol. (percent), Overdely tol. (percent), Unlimited, and In-house production time in days.
- In-house production time in days:** Lot size dependent (Setup time, Interoperation, Processing time, Base quantity) and Lot size independent (InhseProdTime).

Figure 5.7 Material Master: Work Scheduling View

The production scheduling profile can be assigned directly in the **Work scheduling** view or to the production supervisor/scheduler.

Production supervisor/scheduler can be assigned to a production scheduling profile in the customization. During the production order creation, the order type can be automatically selected indirectly from the production scheduling profile, which is assigned to the production supervisor. If both production supervisor and production scheduling profile are assigned to the material master, the system will always prioritize the production scheduling profile first for the production order type determination.

The lot-size-dependent data can be directly updated in the material master from the routing data. Transaction CA97 (Schedule Material Master) can be used for this purpose. The system checks the material type and makes sure that you haven't selected materials with material type KMAT, as the material should be in-house-produced material. With this transaction, you can update the assembly scrap as well. Make sure to set the **Update Material Master Directly** indicator.

As discussed in [Chapter 2](#), the production version is the source of supply for manufacturing and a mandatory master data object. Further details about the master data selection are detailed in [Section 5.4.2](#). Based on this, there are two options to select a production version: **Manual Selection of Production Version** or **Automatic Selection of Production Version**. For **Manual Selection of Production Version**, you have to select the production version explicitly if more than one valid production version exists. For automatic selection of the production version, the system selects the first available alphanumeric production version automatically, or the production version will be selected based on the maintained quota arrangement. If you're converting the planned order to a production

order, then the production version is copied directly from the planned order to the production order, and the system won't determine the production version again in this case.

In both cases of planned order creation and production order creation, the system checks the validity period and lot size range before selecting the production version.

[!] Warning

Make sure that the lot size range of the production version is within the range of both the BOM and routing, they are valid within the full validity period of the production version, and no **Deletion** flag is set.

5.4 Production Order Configuration

In the project environment, it's generally required to create new production order types for various purposes. This new production order type needs a few more dependent customizations so that the production orders can be created and the following execution steps can be completed. The following sections cover the configuration steps needed:

- Production order types (Transaction OPJH)
- Order-type-dependent parameters (Transaction OPL8)
- Scheduling parameters (Transaction OPU3)
- Availability check – order control (Transaction OPJK)
- Production scheduling profile (Transaction OPKP)

Some of the other customization steps are also needed for successful execution, and we'll discuss and detail them in the next sections to come when needed.

5.4.1 Production Order Type

The production order type contains the information to handle order processing. The order types can be managed with Transaction OPJH, as shown in [Figure 5.8](#) or by configuration menu path **SAP IMG • Production • Shop Floor Control • Master Data • Order • Define Order Types**. With order type, you can define the following:

- Control Indicator – CO Partner Update and Commitments Management

- **Reorganization** – Residence Time 1 and Residence Time 2, which we'll cover in detail in [Section 5.7.3](#)
- **Cost Controlling** – Settlement Profile, Functional Area
- **Collective Orders** with goods movement
- **Status Management**, which we'll cover in the next sections
- Number range assignment to order types, which can be internal number range or external number range. Number ranges can be assigned or managed for the order types in this transaction itself or by using Transaction CO82.

Based on the order type, various other parameters and profiles will be created. The order type is defined at the client level.

| | | |
|-------------------------------|--------------------------|---------------------|
| Order category | 10 | |
| Order Type | YBML1 | |
| Short Text | MTS Production Order | |
| Control Indicator | | |
| CO Partner Update | Semi-active | |
| Commitments Mgmt | <input type="checkbox"/> | |
| Reorganization | | |
| Residence Time 1 | 1 | |
| Residence Time 2 | 1 | |
| Cost Controlling | | |
| Settlement Profile | YBMFP1 | PP Valuated to COPA |
| Functional Area | YB20 | Production |
| Col.Order with Goods Movement | <input type="checkbox"/> | |
| Status Management | | |
| StatusProfile Header | | |
| Oprtn status profile | | |
| Number Range General | | |

Figure 5.8 Production Order Type

5.4.2 Order-Type-Dependent Parameters

Order-type-dependent parameters are a combination of order type and plant, which can be maintained with Transaction OPL8 or by

using configuration menu path **SAP IMG • Production • Shop Floor Control • Master Data • Order • Define Order-Type-Dependent Parameters**.

The order-type-dependent parameters are divided into the following tabs:

- **Planning**

The production version, routing, and BOM-related selection parameters are maintained here, as shown in [Figure 5.9](#).

With SAP S/4HANA, production version is the mandatory object, and BOM and routing selection are based on the production version. Here, you can maintain whether the production version selection is manual or automatic. In the **Routing** area, the task list **Application** is predefined to **P** (routings for production). But you also can specify an alternative task list application (**AltTaskListApplc.** field). Priorities of task list selection are specified with **Selection ID**; **Sequence Exchange** and **Alternative Sequences** specify whether alternative sequences are selected and how they are exchanged. The allowed routing types are specified with **Routing Type**. If the **Entry tool** checkbox

is activated, then the system will take you to the operation details screen when you enter an operation.

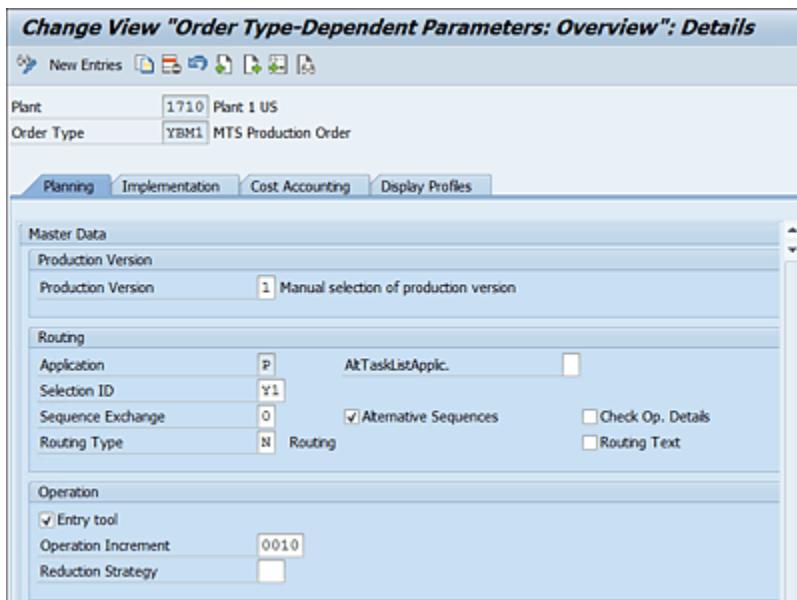


Figure 5.9 Order-Type-Dependent Parameters: Planning Tab

When you scroll down in Transaction OPL8, as shown in [Figure 5.10](#), in the **Bill of Material** area, you can maintain the **BOM Application** field, which specifies the BOM prioritization and relevancy across various applications.

In the **Batch Determination** area, the batch **Search Procedure** is entered for batch-managed materials. **Substitute MRP Controller** and **Substitute Supervisor** (or production scheduler) can be entered here so that the system can choose one when creating an order if was unable to find the person responsible in the material master. In general, these field values are used when creating a production order without reference to a material. In the **Purchase Requisitions** area, you can define when the system will create reservations for stock materials and purchase requisitions for nonstock materials. In the **Quality Inspection** area, you can define the **Inspection Type**. This can be in-process inspection or

GR inspection from production. This is the production planning to quality management integration point.

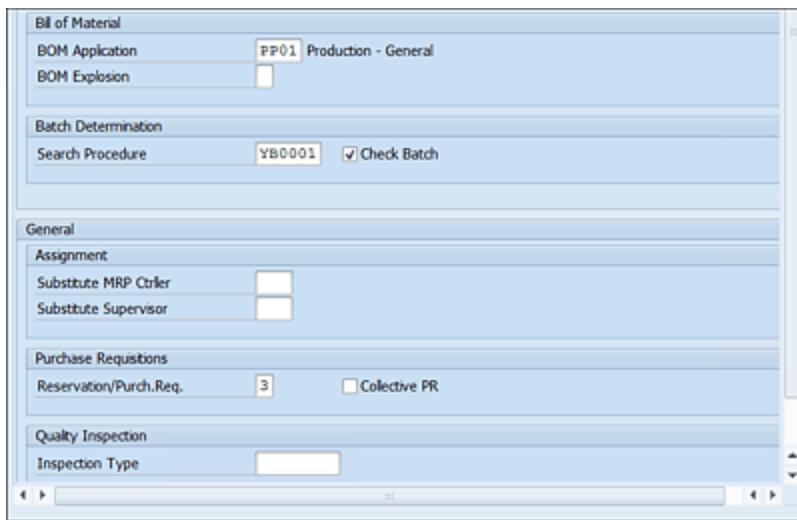


Figure 5.10 Order-Type-Dependent Parameters: Planning Tab (cont.)

- **Implementation**

As shown in [Figure 5.11](#), maintaining all the relevant checkboxes in this tab is important. If you activate the necessary status change documents, then the system will write the changes in statuses to the database for the order. These production order status changes will be useful to check the series of events (status changes) that happened during the lifecycle of the production order. Similarly, if you activate the documented goods movements, the system will capture the relevant goods movements for the production order. You can verify the goods movements in the production order itself or with the Production Order Information System (Transaction COOIS). You can control whether the production order details are stored in the shop floor information for further reporting purposes.

- **Cost Accounting**

As shown in [Figure 5.12](#), the **Cost Accounting** tab mainly deals with how the product is costed. The order type determines how

the production order is settled (settlement profile), and with the order-type-dependent parameters, much more control is given at the plant level for additional default values to the order. One of the most important items in this tab is the **Cost Collector** checkbox. This checkbox determines whether the order costs are collected at the order level or product cost collector (PCC). By using this field, a product can be managed logically as a production order, but for cost accounting perspective it can be modeled as repetitive manufacturing (REM).

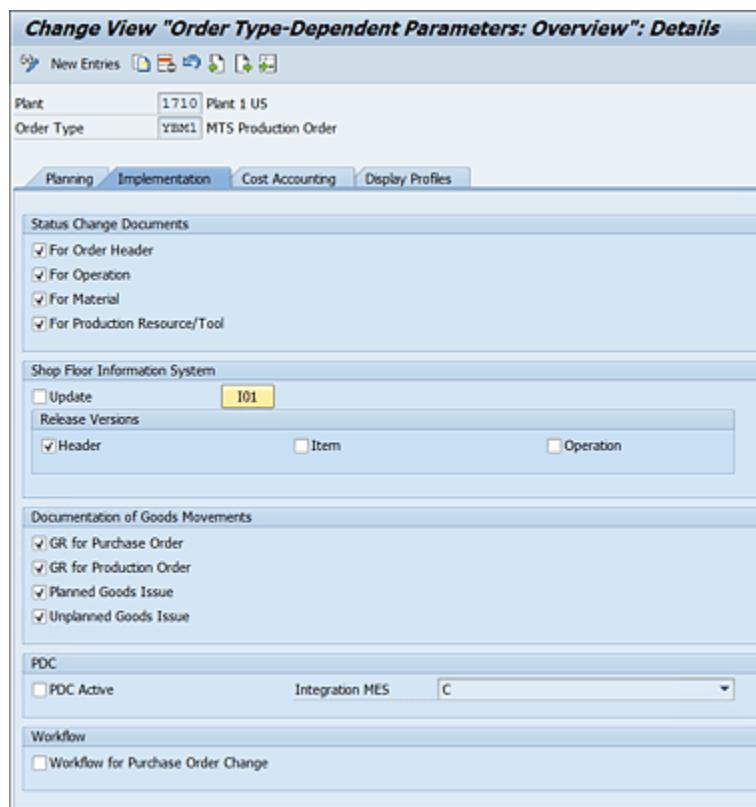


Figure 5.11 Order-Type-Dependent Parameters: Implementation Tab

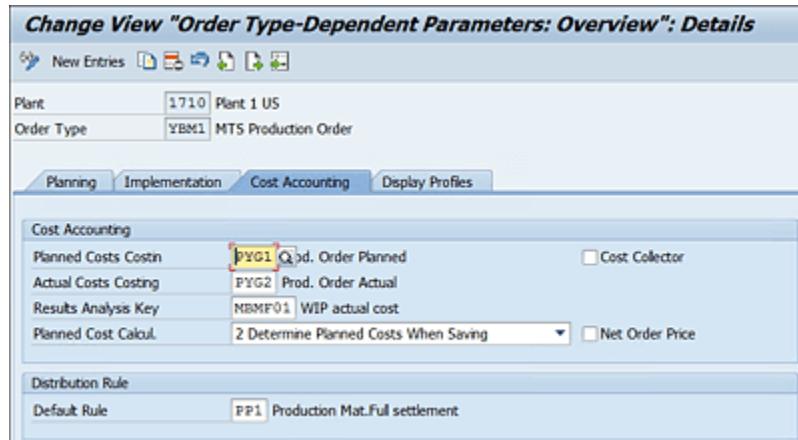


Figure 5.12 Order-Type-Dependent Parameters: Cost Accounting

- **Display Profiles**

In this tab, different display profiles are managed, as shown in [Figure 5.13](#). The display profiles are mainly related to collective orders, but a display profile related to a missing parts list for production orders (**ProfMissPrtsLstOrdNo**) can also be maintained. This profile determines how the missing parts are displayed.

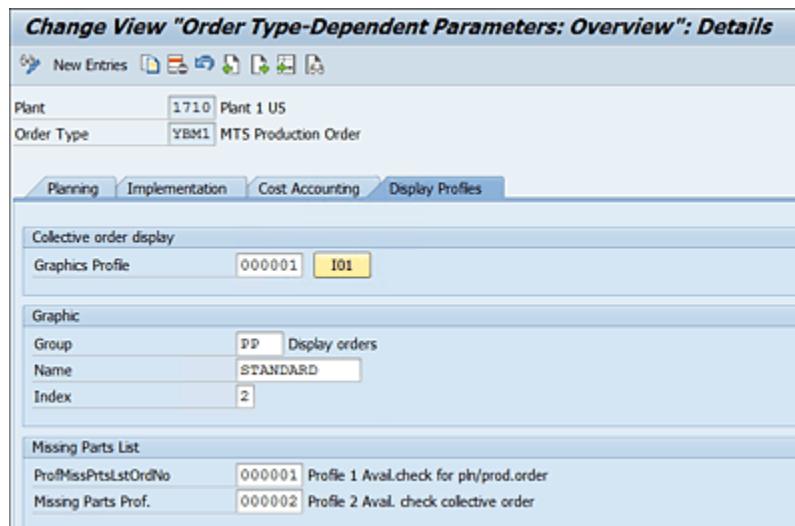


Figure 5.13 Order-Type-Dependent Parameters: Display Profiles Tab

5.4.3 Scheduling Parameters for Production Orders

The scheduling parameters are managed for the plant, order type, and production scheduler/supervisor levels. If you consider all the production schedulers to have the same scheduling parameters, then enter “*” in the **Prodn Superviso** field in Transaction OPU3, as shown in [Figure 5.14](#).

With this customization, the default scheduling type can be maintained when creating production orders. You can maintain and generate capacity requirements, automatic scheduling, and reduction level. The number of days maintained in the **Start in the Past** field means that scheduling will set the order to remain in the past. If the number of days exceeds then, the system will automatically switch the scheduling to “Today” scheduling.

The screenshot shows the SAP Change View "Specify scheduling parameters": Details dialog box. It includes sections for Plant (1710, Plant 1 US), Order type (YBM1, MTS Production Order), and Prodn Superviso (*). The Detailed Scheduling section has checkboxes for Scheduling and Generate Capacity Reqs. The Adjust scheduling section has an Adjust Dates dropdown. The Scheduling control for detailed scheduling section includes a Scheduling Type dropdown (set to 2 Backwards) and several checkboxes for scheduling options like Automatic Scheduling, Automatic log, Scheduling with breaks, From production dates, and Shift Order. The Requirements Date Determination for Components section has an Operation Segment dropdown (Setup) and a Latest Staging Date checkbox. The Reduction section includes a Reduction type dropdown (All operations in the order will be reduced), a Maximum reduction level dropdown (0 Do not reduce), and a % reduction in floats section with six input fields labeled L1 through L6.

Figure 5.14 Scheduling Parameters for Production Orders

5.4.4 Configuring the Availability Checks

To have a comprehensive view of component availability, capacity, and PRTs, an availability check is performed. The following steps are involved in the customization of availability checks. The first three steps are maintained at the client level, and the checking control step is managed at the plant/order type level:

- 1. Define checking group.**

Each material is assigned to a checking group. This specifies how the system checks availability and generates requirements for materials planning. The checking group can be defined with Transaction OVZ2.

- 2. Define checking rule.**

You can define checking rules for various applications such as material requirements planning (MRP), production processing, sales and distribution, and so on. Transaction OPJL is used for checking rules.

- 3. Define the scope of check.**

The scope of check is defined as a combination of checking group and checking rule. With this customization, you can define the goods movements to include in the availability check, stock types to include, and whether to include safety stock, quality inspection stock, blocked stock, and so on. The scope also determines whether to consider the replenishment lead time. If you want the system to consider the replenishment lead time,

then the standard setting is to leave this field blank. You can define the scope of check with Transaction OPJJ.

[»] Note

If you want the system to consider replenishment lead time, then at least one of the following material master fields should be maintained: **GR Processing Time** (either in the **Purchasing** view or **MRP 2** view) or **Planned Delivery Time**.

4. Define the checking control.

With the checking control, you can check the availability of materials, capacities, and PRTs. This is customized at the plant and order type level, which means different order types can have different availability settings, providing the flexibility to commit the components differently based on different criteria. Apart from all the other availability-related settings, you maintain the checking rule in checking control, which, along with the checking group maintained in the material master of the production order header material, will decide the scope of check. The checking control can be activated at production order creation and production order release. These are two distinct business functions. With this approach, you have the flexibility to check and control the availability at these stages. The checking control for both of these business functions—creation and release—is shown in [Figure 5.15](#). This setting can be maintained with Transaction OPJK.

With these checks, you can control whether the availability check, checking rule, and check type are needed or not. The subsequent actions can be controlled as well. For an availability check, the settings can determine whether to create/release the order when

there are missing components or restrict the order creation/release altogether. The appropriate settings can be decided based on the business requirements. Apart from this, for availability checks during order release, you can check the missing parts status while saving the order. With this setting, the system performs the check if the material already has a missing parts status. Otherwise, the availability check won't be carried out. This reduces the load on the system.

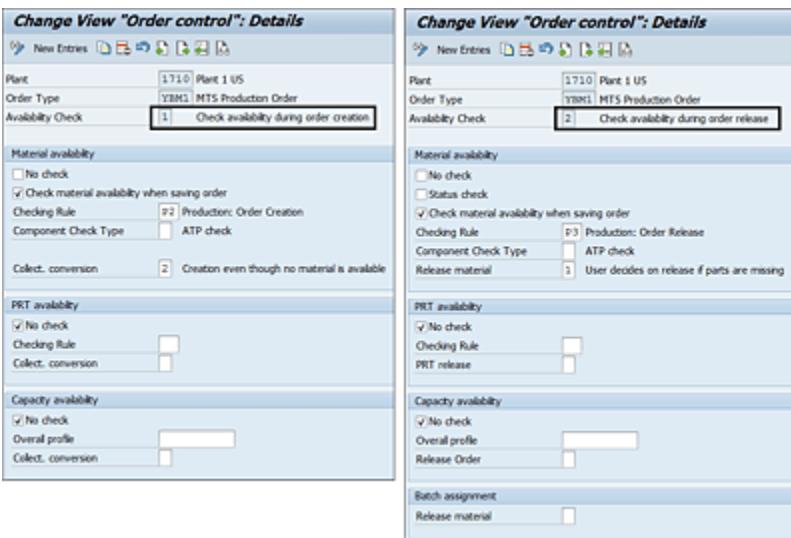


Figure 5.15 Production Order: Checking Control for Order Creation and Order Release

5.4.5 Production Scheduling Profile

The production scheduling profile is used to define what functions will be performed automatically when creating and releasing a production order. This profile is created at the plant level. As shown in [Figure 5.16](#), you can automate many of the functions. The production scheduling profile can be maintained with Transaction OPKP.

Upon order creation, the production order can be released automatically or scheduled for release, and the print function can be

triggered. Automatic GR can be posted if this profile is assigned, and various other functions can be controlled such as material availability checks and confirmations. When you scroll further down the screen shown in [Figure 5.17](#), you can manage controls related to batch management, including whether the batch will be created automatically when the production order is created or created at the time of release, and whether no automatic batch creation will be maintained.

Change View "Production Scheduling Profile": Details

| Automatic Actions | |
|--|--|
| On Creation | On Release |
| <input type="checkbox"/> Release | <input type="checkbox"/> Execute Printing |
| <input type="checkbox"/> Document Links - Material | <input checked="" type="checkbox"/> Schedule Order |
| <input type="checkbox"/> Document Links - BOM | <input type="checkbox"/> Document Links - Material |
| | <input type="checkbox"/> Document Links - BOM |
| | <input type="checkbox"/> Create Control Instructions |
| Material Availability Check | |
| Goods Receipt | |
| <input type="checkbox"/> Confirm Available Partial Qty | <input type="checkbox"/> Automatic Goods Receipt |
| Capacity Planning | |
| Leveling | |
| Overall Profile | |
| Availability Check | |
| <input type="checkbox"/> Confirm Capacity | <input type="checkbox"/> Finite Scheduling |
| Confirmation | |
| <input type="checkbox"/> No Update of Excess Receipt | <input type="checkbox"/> No Update of Short Receipt |
| <input type="checkbox"/> Adjust Quantities in Order to Actual Values | |

Figure 5.16 Production Scheduling Profile: Settings

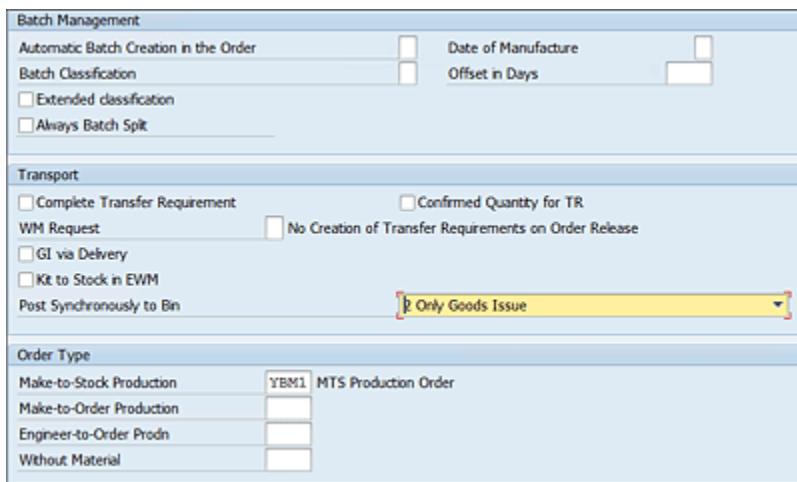


Figure 5.17 Production Scheduling Profile: Settings (Cont.)

In the **Transports** section shown in [Figure 5.17](#), a few settings are available for SAP Extended Warehouse Management integration with product planning. Which order types will be picked automatically can be defined for make-to-stock production, make-to-order production, and engineer-to-order production.

5.5 Production Order Preparation

The production order is the central component in discrete manufacturing to control and capture production-related information. The production order contains the product to be produced, the quantity, and date of production, as well as the operations to be followed and components to be used for production. In the next section, we'll discuss the details of production orders. In the production order preparation stage, production orders are created, scheduling happens, planned costs are calculated, availability of needed components and resources are checked, and the capacity situation is evaluated and leveled, which will be discussed in [Chapter 8](#).

5.5.1 Production Order Creation

The MRP run generates planned orders for in-house production that can be converted to production orders. At the time of planned order conversion, the production version will be copied directly to the production orders. The system won't redetermine the production version, so the material components that are determined in the planned orders will be directly copied to the production orders. The planned order dependent requirements will be converted to order reservations. You can reread the BOM components during the conversion. If the planned order is already created with lead-time scheduling and capacity planning (during the MRP Live run with the **Scheduling** indicator set as **2**), and the operations are already dispatched, then the system will set the **DSPT** status for the operations during conversion to the production order. When the planned order is converted to the production order, the planned order

will be deleted from the database. The planned order reference will be available in the production order in the **Assignment** tab page. The planned order will be available in the database only in the case of partial conversion of planned orders. However, this planned order will be fixed, meaning that the next MRP won't automatically change this fixed planned order.

Planned order to production order conversion can be performed in different ways:

- **Transaction CO40: From Planned Order**

This is for the individual conversion of a planned order to a production order.

- **Transaction CO41: Collective Conversion of Planned Orders**

Various options are available for selecting a collective conversion of planned orders, as shown in [Figure 5.18](#).

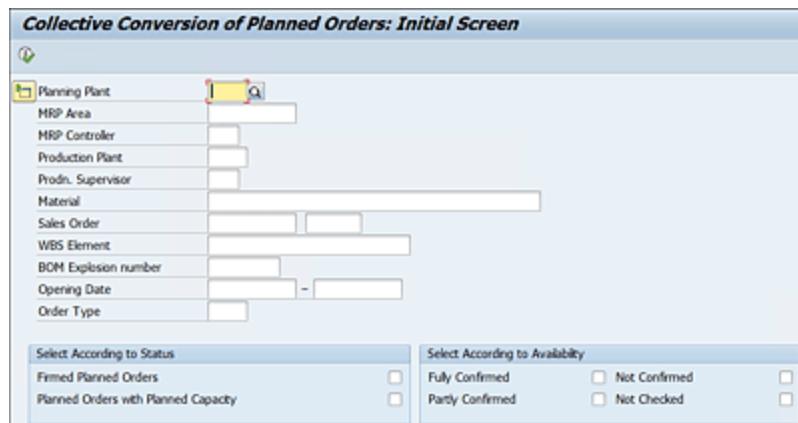


Figure 5.18 Collective Conversion of Planned Orders

- **Transaction CO48: Partial Conversion**

Partial conversion of planned orders can be performed from the same menus or transactions used to convert planned orders in full quantity, that is, from Transaction CO40, the **Stock/requirements List**, and the **MRP List**.

With partial conversions, you can create the production orders and

execute them on different days. The production version considered for the original planned order will be considered for the partial conversions also. (If you have separate production versions based on quantity, the system will also consider the original planned order's production version.)

Production orders can be created in different ways:

- **Transaction CO01: With Material**

The production order can be created manually with this transaction code. The **Production Order Create: Initial Screen** (see [Figure 5.19](#)) includes the important fields the **Material**, **Production Plant**, and **Order Type** fields. If the order type supports external number ranges, then maintaining the **Order** number up front is necessary.

Other than these, the other remaining field is **Planning Plant**, which usually isn't necessary to maintain unless you want to perform the GR in a separate plant. In that case, the production operations will be performed in the production plant, and GR will occur in the planning plant. In normal cases, maintaining the **Production Plant** field is sufficient because the system will copy the production plant during GR posting.

If you maintain the order type in the production scheduling profile, which is in turn maintained in the material master of the production material, the system will find the order type directly. So, maintaining the order type during production order creation isn't required. Similarly, the system will find the order type from the

production scheduler maintained in the material master if it's linked to an appropriate production scheduling profile.

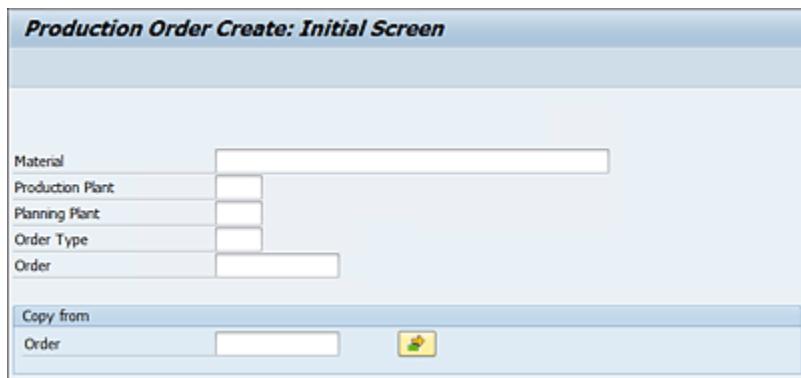


Figure 5.19 Production Order Create with Material

- **Transaction CO07: Without Material**

In certain situations, it may be required to create production orders without a reference material. The most widely used business process to handle is the rework process. In this case, it's required to maintain the production plant and order type. If required, you can maintain the sales order or work breakdown structure (WBS) element as a reference. The system will take you to the next screen to maintain the order-specific details. As there is no master data reference in this case, the system will expect a reference operation set. If it's created and available, the set can be selected; otherwise, the system won't allow you to create the production order.

To handle these situations, you can use the **Define Default Values** option in Transaction OPJG. With this setting, the system finds an operation when there is no operation selected because routing isn't created or can't be determined. You can create an operation automatically with the data shown in [Figure 5.20](#).

In the case of a rework order, order settlement details should be maintained manually. In the **Maintain Settlement Rule Overview**

screen, maintain the account assignment category as “Order”, the original order for which you are performing the rework as “Settlement Receive”, and the percentage as 100. With this data entered, you can settle this production order’s costs to the original order.

- **Transaction CO08: For Sales Order**

The production order can be created with reference to the sales order by maintaining the sales order number, sales order item, and order type. The system will automatically take the material, quantity, dates, and plant from the sales order. Even though there is a link between the sales order and production order, if there is a change in the sales order item’s dates or quantities, those changes won’t be automatically updated in the production order.

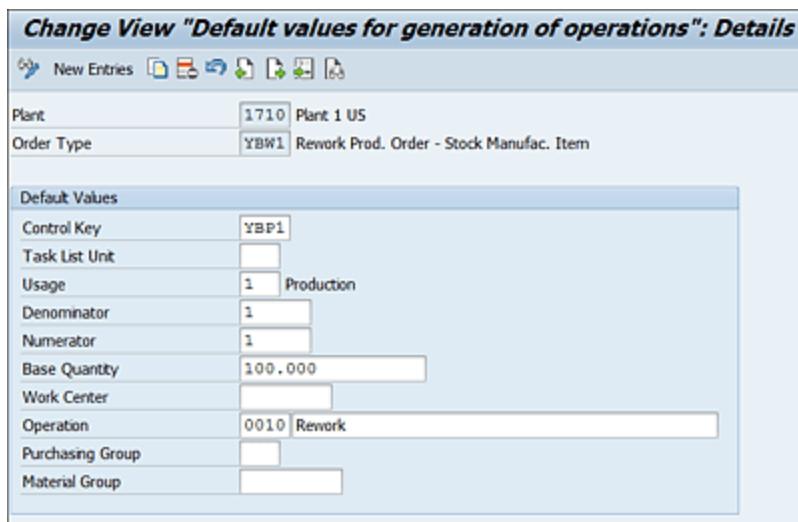


Figure 5.20 Default Values for Generation of Operation

[»] Note

Make sure that the sales order item allows the sales order stock in this case.

5.5.2 Production Order Scheduling

As discussed in the previous chapter, there are two methods of scheduling for planned orders. The first method is basic date scheduling, which is based on the in-house production time maintained in the material master, and the second method is lead-time scheduling, where the times maintained in the routing will be considered. If you want to use capacity planning, then lead-time scheduling is a mandatory prerequisite.

Lead-time scheduling is always used for production orders. During production order creation, the system takes the basic dates from the planned order, or, if you're creating the production order manually, the system takes at least one basic date to be maintained and then determines the other basic date based on the scheduling type. The exception is with the **Today Scheduling** scheduling type, in which the lead-time scheduling determines the exact dates and times of each operation. Apart from the individual operation times, the system also considers other transition times maintained: *queue time*, *wait time*, and *move time*. The safety times are float before production and float after production (safety time), which the system picks from the **Sched. Margin Key** defined in the material master of the product. [Figure 5.21](#) shows the production order dates at the header level. The basic dates are calculated on the time buckets of days, so

the time is specified as 00:00. On the other hand, the scheduled dates consist of hours up to the seconds.

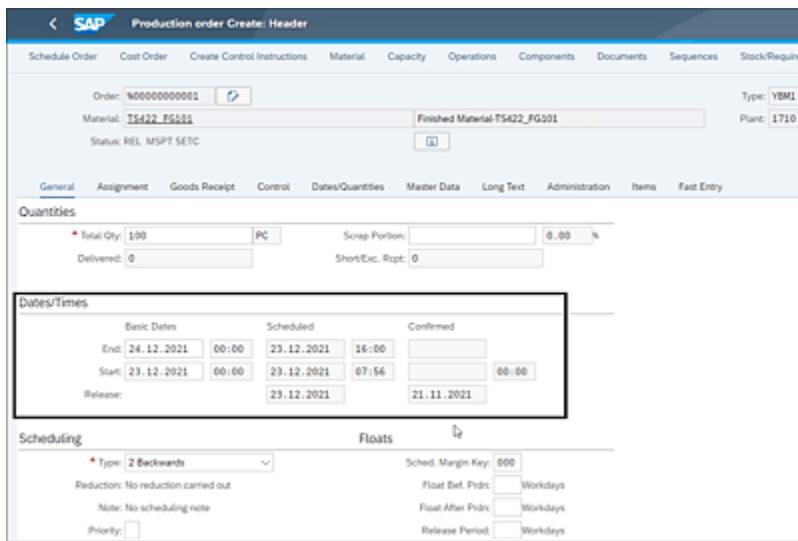


Figure 5.21 Production Order Dates at the Header Level

As shown in [Figure 5.22](#), the operation duration consists of **Queue Time**, **Setup Time**, **Processing Time**, **Teardown Time**, and **Wait Time** (if applicable). The move time is the time the product moves between operations and is assigned to the preceding operation. While calculating the operation duration, the system also considers the factory calendar, working times, and scheduling formulas maintained in the work center.

Production order scheduling can be controlled by maintaining the appropriate scheduling type in the production order creation screen, as described here:

- **Backward scheduling**

You start with the basic finish date and determine the other dates in the backward direction.

- **Forward scheduling**

You start with the basic start date and determine the other dates in the forward direction.

- **Today scheduling**

You start with today's date as the basic start date; this is another type of forward scheduling.

There are other scheduling types also such as only capacity requirements, forward in time, and backward in time. The scheduling type can be defined with Transaction OPJN, and the scheduling can be defaulted at the plant and order type level with Transaction OPU3, as shown previously in [Figure 5.14](#).

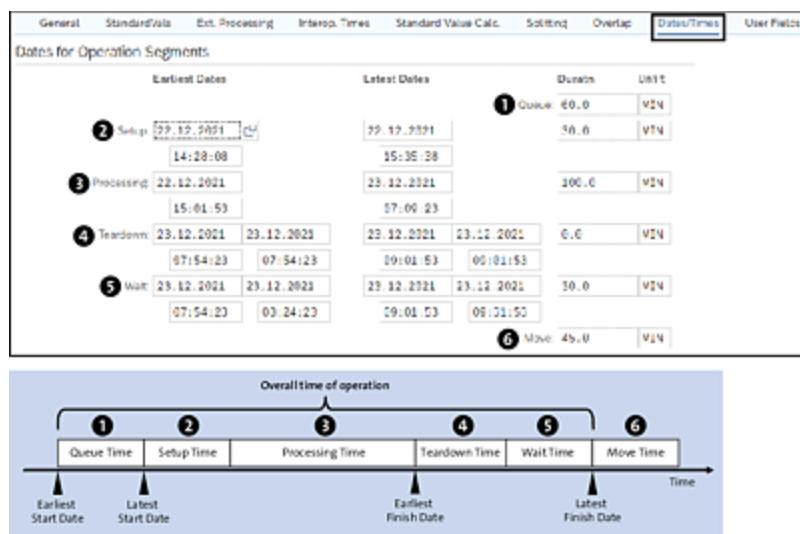


Figure 5.22 Dates and Times in the Operation Details Screen

5.5.3 Running Availability Checks

For smooth production operations and execution, it's imperative to check the availability of all the needed components, capacities, and PRTs. You can perform an availability check automatically or manually during the creation or release of a production order. This avoids the disruption during the production processing. During the availability check, if needed components aren't available, then the system will create a missing parts list to procure or expedite the component availability. Now based on the business processes, if

missing parts exists, you can control whether the production order will be created/released or not. The details of the customization settings are given in [Section 5.4.4](#).

The system checks for availability based on the available-to-promise (ATP) logic. Specifically, the system checks whether the component requirements are covered on the date where they are required; if not, the system checks at what point in time in the requirements can be covered if the full required quantity isn't available.

The availability check can be determined in the following ways:

- By default, the system will try to cover the full requirement quantities.
- Partial quantities can also be committed based on the settings maintained in the production scheduling profile (Transaction OPKP) by activating the **Confirm Available Partial Qty** setting, as shown earlier in [Figure 5.16](#). During the availability check, if there is a partial quantity available for one component, then the system will commit on the respective partial quantities for all the other components.

The availability check can be performed interactively by directly accessing the **Availability Check** option from the **Functions** menu, as shown in [Figure 5.23](#). From the same menu, the availability check result can be reset.

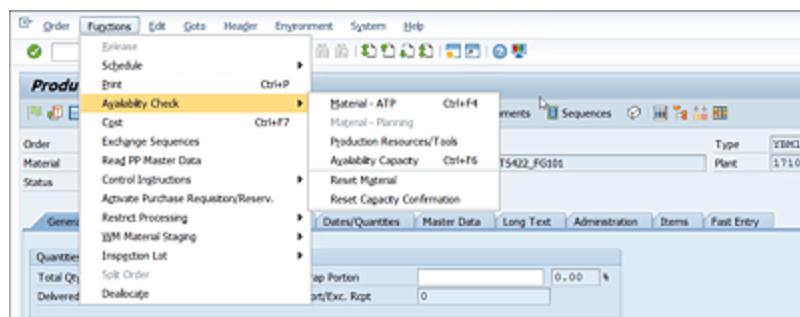


Figure 5.23 Production Order Availability Check

The collective availability check can be performed for a group of production orders by using Transaction COHV and selecting **Material Availability Check** in the **Mass Processing** tab page or by using Transaction COMAC.

The product order will track the statuses with reference to the availability check. For an unchecked production order, the system status will be **MANC** (material availability not checked). If all the material components are available, the system sets the status as **MACM** (material committed). If one or more components are missing, the system sets the status **MSPT** (material shortage). In the production order, click on the **Check Material Availability** button; if all the components are available, the system will give the message about the component availability. If any components are missing, a popup will appear, as shown in [Figure 5.24](#).

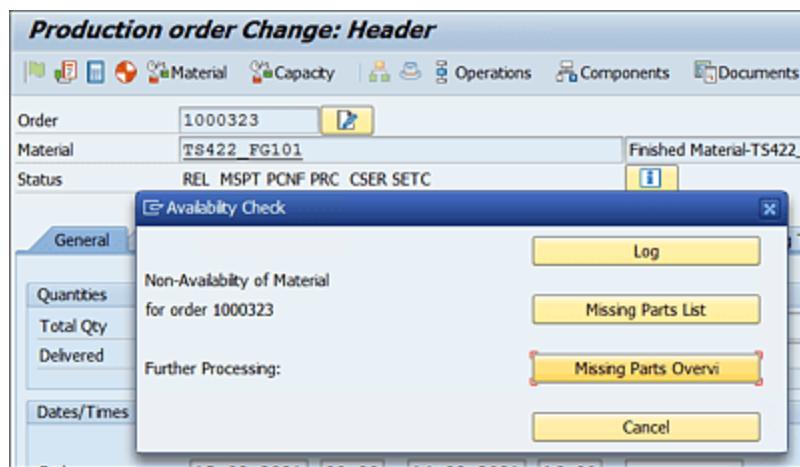


Figure 5.24 Production Order: Material Availability

If you select the **Missing Parts List** button in this popup, the system will take you to the next screen, which will show all the missing components. If you select the other option, **Missing Parts Overvi**,

the system will show the missing components so you can adjust the quantities of the missing components and the storage location.

[!] Warning

You can adjust the component quantities during the production order handling. If any component quantity is adjusted or deleted, then stock mismatches and product costing issues will surface.

You also can check the missing components with Transaction CO24 (Missing Parts Info System). It's advisable to execute the mass availability check prior to executing the missing parts info system.

The capacity availability check can be performed for the production order. To perform the production activities, the work center capacity is required. The system checks the capacity requirements of the production order with the capacity offered by the work centers. As specified in [Section 5.4.4](#), an overall profile must be maintained in the checking control (Transaction OPJK).

[»] Note

The indicator **Relevant to Finite Scheduling** should be maintained in the work centers.

The PRT availability can be checked during creation or release of production orders. PRTs can be a material PRT, PRT master, equipment, or document that carries a status in the master record specifying whether a PRT is available or not. There are two possibilities with the PRT availability check. In the customization for checking control (Transaction OPJK), you'll define whether the

system checks only the status of the PRT or both the status and the unrestricted stock situation of the PRT.

[»] Note

If you perform any changes to a production order that influence the PRT availability, the system won't automatically execute the PRT availability check. It's always advisable to execute the PRT check manually whenever you make any changes.

5.6 Production Order Execution

After the production orders are prepared in all respects, then the production scheduler will make a decision on loading the production and starting the execution steps to produce the required products.

The execution step involves releasing the production order. After the production order(s) are released, printing of various shop floor papers occurs next. Staging of needed components, order/operation confirmation, and ultimately performing the GR of production will culminate in the production order execution. In the next sections, we'll go through these steps in the detail.

5.6.1 Release of Production Orders

The release of production orders is the first step in the execution process, and the subsequent steps can only be performed after that release. These steps include, shop floor papers printing, component withdrawal, confirmation of operations, and GR posting.

When a production order is created, the system will set the status to **CRTD**. After the production order is released, the system will set the **REL** status to replace the **CRTD** status in the production order. With this action, the system will also release all the operations contained in the production order.

Production orders can be released in one of the following ways:

- **Automatic release of production orders**

Production orders can be released automatically when they are created by maintaining the settings as mentioned in [Section 5.4.5](#) (Transaction OPKP). The business process is such that the time

between order creation and release is short, and then this method can be adopted.

- **Individual/manual release of production orders**

Production orders can be released interactively from the production order screen by clicking the **Release** button, as shown in [Figure 5.25](#).

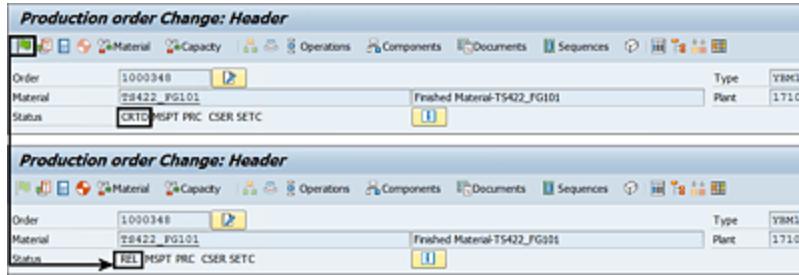


Figure 5.25 Release of Production Order

- **Collective release of production orders**

Production orders can be released collectively with Transaction CO05N. With this transaction, various selection criteria are

available to select appropriate production orders for releasing, as shown in [Figure 5.26](#).

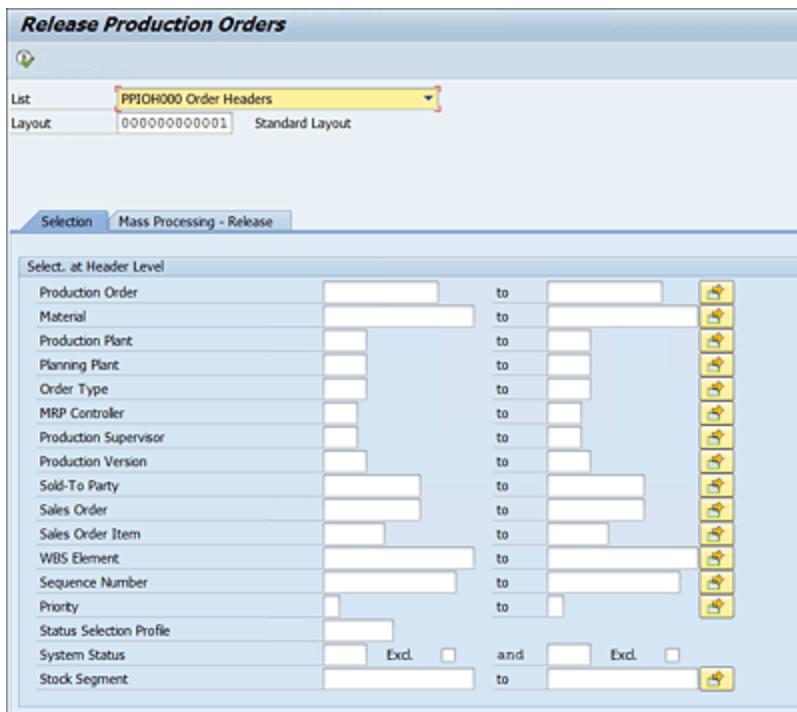


Figure 5.26 Collective Release of Production Orders: Selection Screen

[+] Tip

If you want to change the production order status back from **REL** (released) to **CRTD** (created), then you can do so by reading the master data via **Functions • Read PP Master Data** (provided the production order hasn't undergone any execution steps, such as confirmation, goods movements, etc.).

- **Release of operations**

If the production process takes a long lead time, it makes sense to release individual operations in the production orders. When you release the operation, the system sets the operation status to **REL**, and the production order will have the **PREL** (partial release) status. After all the operations are released, the system will set the

production order status to **REL**. To avoid releasing one after the other manually, you can use the trigger points.

[»] Note

When releasing the operations, make sure they are released sequentially; that is, make sure that the preceding operation is released first.

Only confirmations, printing of shop floor papers, and goods movements can be performed for the released operations.

5.6.2 Printing Shop Floor Papers/Lists

Based on the business and physical processes adopted on the shop floor, it may be necessary to print shop floor papers. Various types of papers/lists can be printed such as time tickets, confirmation slips, pull lists, goods withdrawal slips, kanban tickets, and PRT overviews. They are broadly classified as operation-related slips, component-based slips, multipurpose lists, and so on.

For printing shop papers, it's a prerequisite to maintain the relevant customization settings with Transaction OPK8, as shown in [Figure 5.27](#).

| Change View "Names of lists": Overview | |
|--|---------------------|
| | New Entries |
| | Print |
| | Save |
| | Cancel |
| | Close |
| | Help |
| Dialog Structure | |
| Names of lists | |
| Spool parameters for user | |
| Reference order types | |
| Forms | |
| Print programs | |
| List control for transactions | |
| Printer specification | |
| Flow control for transactions | |
| Table accesses | |
| Name of the Lists | |
| List | List Name |
| LF01 | PRT overview |
| LG01 | Object lst |
| LG02 | Op. control ticket |
| LG03 | Job Ticket |
| LG04 | Kanban ticket |
| LK01 | Pick lst |
| LK02 | Goods issue slp |
| LK03 | Goods receipt lst |
| LP01 | |
| LP02 | |
| LV01 | Time ticket |
| LV02 | Confirmation slip |
| LV03 | Document Links |
| LV04 | Operation Splitting |

Figure 5.27 Define Print Control

Print settings can be managed and controlled based on order type, plant, or MRP controller level. Shop floor papers can be printed interactively or automatically. You must have released the production order/operation before printing. There are two modes of printing: original prints and reprints. With original prints, the system prints all the relevant order-related papers. After a specific paper is printed, the system won't print the original again, and only reprinting is possible.

You can print directly from the production orders by accessing **Functions • Print**. All the assigned and relevant lists will be printed. If you want to select any specific lists, then you can do so from the **Order • Settings • List Control**. From the same menu, you can access the print control to select whether you want the printing to be

online (printing takes place after saving) or in the background (system generates background print jobs). For background printing, settings will be made in Transaction OPK8 (Flow Control for Transactions). After you make the settings, the print jobs can be printed with report PPPRBTC.

Upon order release, the shop floor papers can be printed automatically. This is managed in the customization settings for production scheduling profile OPKP. With Transaction CO04N, production orders can be printed collectively.

5.6.3 Component Withdrawal for Production Orders

Components are needed for production processes and are consumed during processing to produce finished products. When the production order is created, the issue storage location is determined. The issue storage location, or production supply area (PSA), can be maintained in the material master of the component, in the work center by maintaining PSA, in the BOM component in the storage location/PSA fields, or the MRP group will determine the issue storage location from the production version.

Material components are supplied to the issue storage location or PSA where the components are stored temporarily for a short period to be consumed in the production. There are various options available for material staging. Material staging can be performed with a pull list, in which the needed components can be staged to the issuing storage location by stock transfer. The replenishment of components can be handled with kanban, which is discussed in [Chapter 6](#).

After the material staging, the component consumption for production orders can be performed in the following three ways.

- **GI posting with inventory management**

When the components are available, they can be withdrawn for the production order. This process is managed as GI posting. For the GI posting, the system uses movement type 261. Based on the business process, either the components are directly consumed from the main store/warehouse, or they are staged to a nearby storage location and, from there, are used/consumed for the production order. The GI posting can be performed for the order with Transaction MIGO, as shown in [Figure 5.28](#).

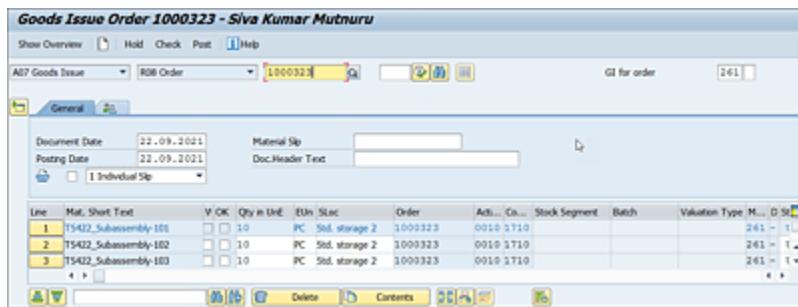


Figure 5.28 GI to Production Order with Transaction MIGO

You also can perform GI for a reservation. During the production order creation, reservations are created for the component requirements. All the component requirements are assigned to the same reservation as different line items. For the GI posting to take place, the production order must have already been released.

GI posting also triggers/enables various activities in the background:

- Component stock/inventory are reduced (both at the storage location and plant level).
- Consumption statistics are updated with the GI quantity.
- The reservation is reduced by the GI quantity.

- A material document is created for GI, and a finance document is created containing all financial postings into material stock and consumption accounts.
- **GI posting**
Picking is the process to perform the GI for selected production orders interactively via Transaction CO27, as shown in [Figure 5.29](#). With the picking list, the system selects the orders that aren't created, locked, or technically completed. The components should not be backflush relevant, bulk products, and so on.

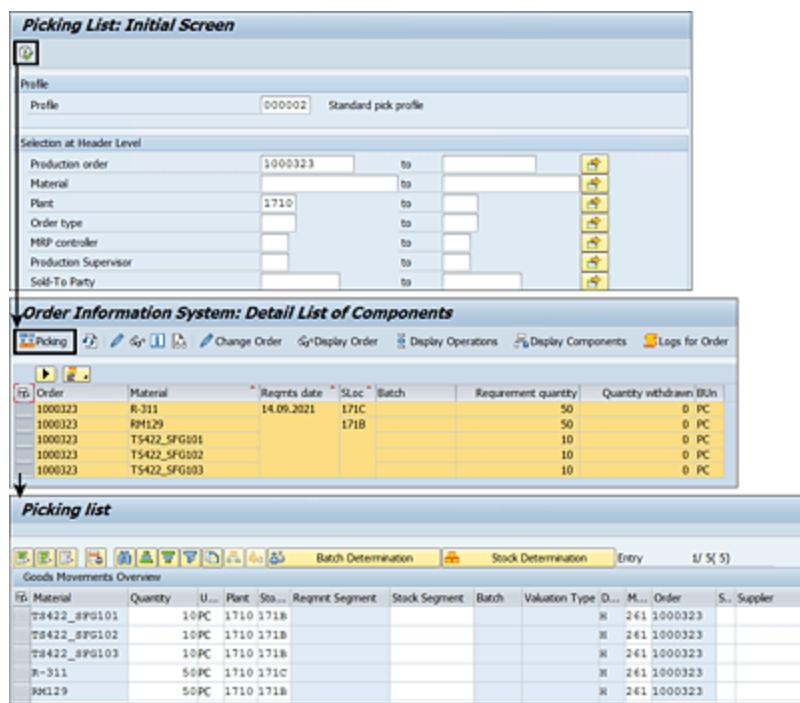


Figure 5.29 Pick List: Transaction CO27

If needed, the component quantities can be adjusted with the pick list. The picking system performs the stock determination for each component requirement. When you save the picking list, the system posts the GI of all the selected components.

- **Backflushing**

In the backflushing process, the GI of components is posted automatically when the operation confirmation is posted for which these components are assigned. It means the GI isn't posted until the operations are confirmed. This causes a delay in the GI posting, but, at the same time, the effort to post GI is reduced.

Backflush can be activated in three ways in various master data:

- **Material master**

In the component material master, the backflush function can be activated in the **MRP 2** view with the **Backflush** field that has two possible options: **Always Backflush** and **Work center decides whether to backflush** as shown in [Figure 5.30](#). There is actually a third option of keeping the field blank.

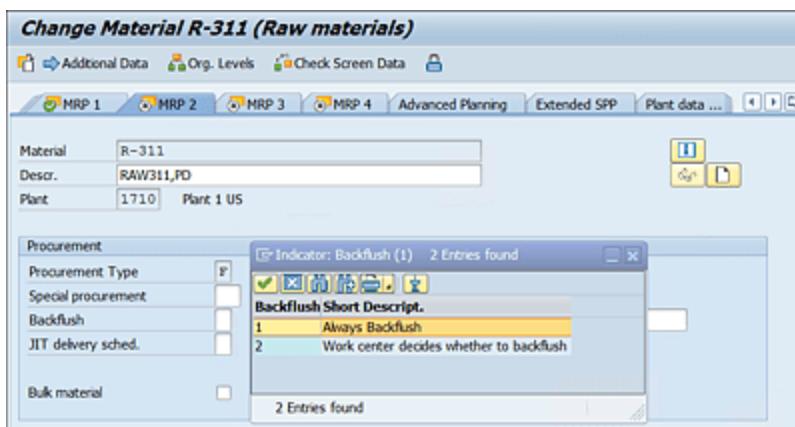


Figure 5.30 Backflush Field: Material Master

- **Work center**

If you've selected the **Work center decides whether to backflush** option, then maintaining the **Backflush** indicator in the work center is needed, as shown in [Figure 5.31](#).

- **Routing**

If you specifically assign any component to an operation, then the **Backflush** field will be enabled so that you can maintain the

indicator. You can manage the **Backflush** indicator directly in the **Production Order Change: Component Overview** screen, as shown in [Figure 5.32](#).

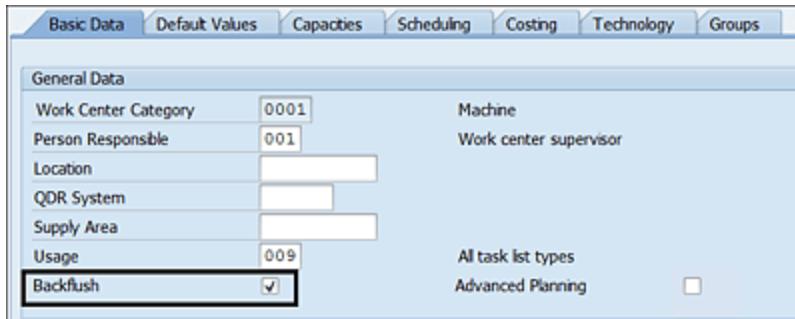


Figure 5.31 Backflush Indicator: Work Center

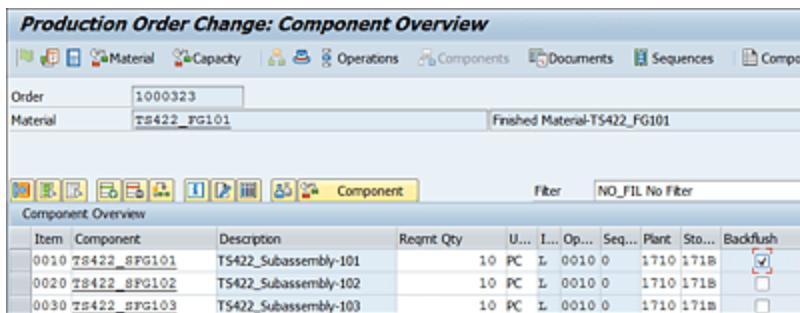


Figure 5.32 Backflush Indicator: Production Order Change Component Overview

Based on the **Backflush** field/indicator in the master data, the **Backflush** indicator will be derived in the production order. At the end, the final control is in the **Production Order Change: Component Overview** screen. If you manage this indicator directly in the production order, then it will be applicable for only this specific production order. If stock/inventory isn't available for some of the components, then these issues must be resolved afterwards.

For various reasons, if any additional components are needed for the production order, the additional components can be issued with reference to the production order. This process is called *unplanned GI* or *unplanned goods withdrawal*. In this process, the consumption

of additional components can be reviewed in documented goods movement for the production order. Unplanned component costs are added to the actual cost of the production order.

5.6.4 Confirmation

The confirmation documents the progress of the production process to provide visibility and records the quantities, work centers, activities, dates, and personnel data used. The confirmation can be performed for an operation or for the production order itself. With confirmation, the system updates the status of the operation and production order. After the final confirmation is posted, the operation/order receives the status **CNF**. For a partial confirmation, the status **PCNF** is updated. The quantities, activities, dates, and times are written to the production order. The actual costs are updated to the production order. Based on the confirmed quantity for the operations, capacity reduction will be carried out proportionately. Backflush-relevant components are goods issued, and, if applicable, the automatic GR will also be posted with the confirmation of the last operation.

Confirmations can be posted for operations in different ways. If you want to confirm the quantities, activities, and duration, you can use *time ticket confirmation* or *progressive confirmation*. If you want to confirm a particular point in time, you can use *time event confirmation*. Each method is described here:

- **Time ticket confirmation**

You can confirm quantities, activities, duration, and personnel information of the operation confirmed. The quantities confirmed can be yield, rework, and scrap. The activities confirmed are based on the standard value key (setup time, machine time, labor

time, etc.). With Transaction CO11N, you can enter the time ticket confirmation, as shown in [Figure 5.33](#).

The screenshot shows the SAP CO11N interface for entering a time ticket. At the top, there are tabs for 'Goods Movements' and 'Actual Data'. The main area is titled 'Enter Time Ticket for Production Order'. It displays the following information:

| | | | | | | |
|--------------|----------------------|--|---------|----------|-------------|-------------------------------|
| Confirmation | 1017 | Order | 1000348 | Material | TS422_FG101 | Finished Material-TS422_FG101 |
| Operation | 0010 | Sequence | 0 | Assembly | | |
| Work Center | ASSEMBLY | Plant | 1710 | Assembly | | |
| Confirm.type | Partial confirmation | <input type="checkbox"/> Clear open reservations | | | | |

Below this, there are three sections:

- Quantities:** To Be Confirmed (Yield: 10, Unit: PC), Scrap, Rework, Reason for Var.
- Activities:** To Be Confirmed (Setup: 30, Machine: 10, Labor: 10, Activity 4, Activity 5, Activity 6). Each activity has a 'Unit' column (MIN) and a checkbox column.
- Personnel:** Personnel No. and Time ID fields.

Figure 5.33 Time Ticket Confirmation for Production Order Operation (Transaction CO11N)

Here you can see that the first operation of the production order has been entered. The confirmation type is **Partial Confirmation**. In the **Activities** section, apart from the activities **Setup**, **Machine**, and **Labor**, the other activities **Activity 4** to **Activity 6** are also displayed. The sections and details to be displayed in the time ticket confirmation can be adjusted based on the confirmation profile. In the **Reason for Var.** field, you can enter whether there is a deviation from planned to actual quantities.

How the time ticket confirmation screen (Transaction CO11N) is displayed can be configured with the confirmation profile via Transaction OPK0, as shown in [Figure 5.34](#). Based on the requirements, you can define various customization profiles. In the **Area Selection** tab page, you can select the different options

given in the **Header** area, and the area details can be selected from the dropdown menus in the **Detail areas** section.

Figure 5.34 Confirmation Profile: Area Selection

In the **Defaults** tab, as shown in [Figure 5.35](#), you can define how the confirmation type, default value proposal, and activities will appear.

[+] Tip

The confirmation profile can be defined as a standard profile or can be assigned to a specific user in the user parameters with parameter **CORUPROF**.

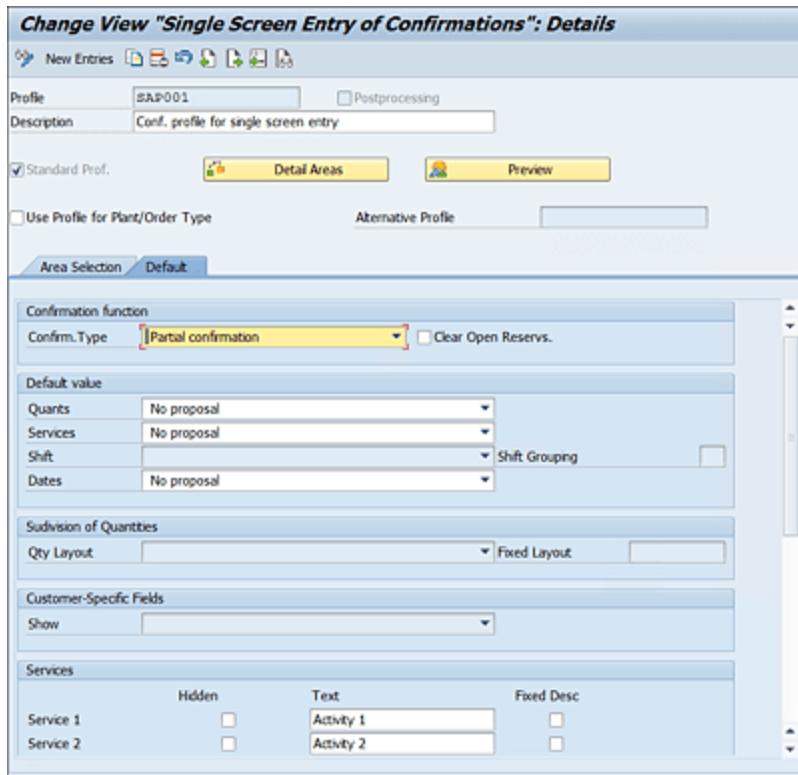


Figure 5.35 Confirmation Profile: Default

Confirmation type (**Confirm. Type**) field plays an important role. During confirmation of an operation (with Transaction CO11N), if the confirmed operation is partially completed, you can select **Partial Confirmation**, and the system posts the partial quantities and other values. The system sets the operation status to **PCNF**.

If the operation has been processed fully, you can set this indicator to **Final Confirmation**, and the system will set the operation status to **CNF**. The other option is to choose **Automatic Final Confirmation**, which works based on the quantity produced during operation processing. The system calculates the total quantity produced. If the total quantity (Yield + Scrap + Rework) is less than the operation quantity, the system will post the partial confirmation. If the total quantity is equal to or more than operation quantity, the system will automatically execute final confirmation.

Whether a production order operation can be confirmed or not is determined by the operation control key. (See [Chapter 2, Section 2.6.3](#) for detailed information on the control key.) In the **Control key** field shown in [Figure 5.36](#), various options are available. So, selecting an appropriate control key in the routing definition is required. The **Milestone confirmation** option is a special type of confirmation, wherein system also confirms all the proceeding operations if you confirm the operation with **Milestone confirmation** enabled. In general, these operations are called milestone operations.

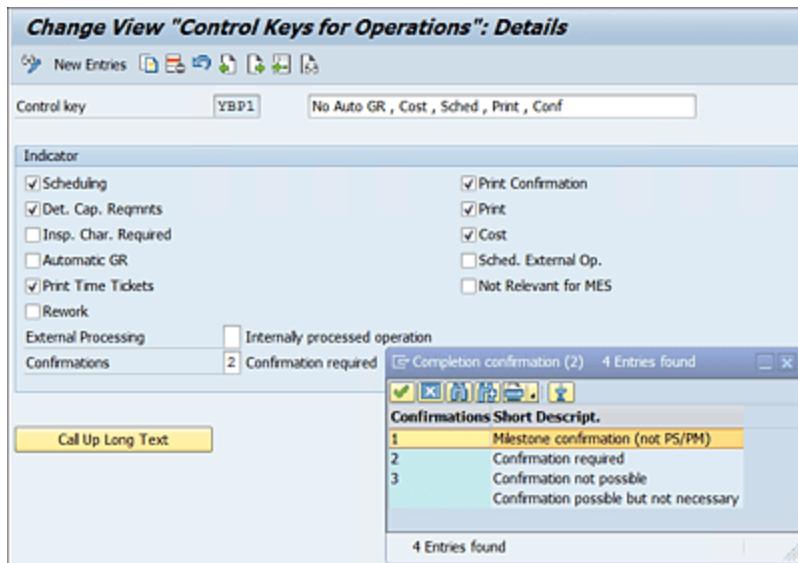


Figure 5.36 Operation Control Key: Confirmation-Related Settings

As detailed in the previous section, with the confirmation, the system reduces the capacity requirements on the work center. How and how much of the capacities are reduced is based on the settings maintained in the work center **Capacities** tab page, as shown in [Figure 5.37](#).

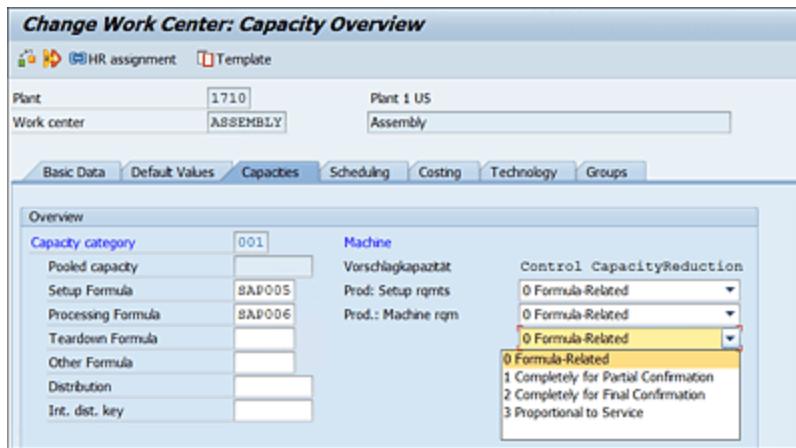


Figure 5.37 Capacity Reduction with Confirmation: Settings in Work Center

There are four options available, but the default is **Formula-Related**. It's important to know the options and set the work center master data accordingly.

[»] Note

When there is a final confirmation, the capacity requirements of the operation are completely reduced.

For operation confirmation, there are other options also:

- Transaction CO19: Time Event
- Transaction CO12: Collective Entry
- Transaction CO1F: Progress Confirmation
- Transaction CO1V: Fast Entry - Time Ticket

- **Order-based confirmation for production order**

With Transaction CO15, you can access the confirmation for the entire production order. When you enter the confirmation at the order level, the proportionate operation quantities and activities will be posted. You can access the goods movements button, where you can accept the proposed quantities and change the quantities interactively. The production order confirmation screen is shown in [Figure 5.38](#).

The screenshot shows the SAP interface for confirming a production order. At the top, it displays the order number (1000348), status (REL MSPT PRC CSER SETC), material (T8422_FG101), and material description (Finished Material-T8422_FG101). Below this, the 'Confirmation Type' section includes options for 'Partial confirmation' (selected), 'Final Confirmation', and 'Autom. Final Conf.'. Under 'Actual Data', there are fields for Yield Quantity (10, PC unit), Scrap Quantity, Rework Quantity, Reason for Var., Personnel no., and To Be Confirmed (Start Execution: 24.09.2021 00:34:10, Finish Execut.: 24.09.2021 00:34:10, Posting Date: 24.09.2021). A 'Confirmed to Date' section shows values of 0 for all categories. A 'Planned t/b Conf.' section shows values of 10 PC for Yield Quantity and 0 for others. A 'Confirm. Text' field is present at the bottom.

Figure 5.38 Confirmation: For Order (Transaction CO15)

- **Display of confirmation**

With Transaction CO14, you can display confirmations for an order. If only one confirmation exists for an operation, the system will branch you to the confirmation of the operation. If more than

one confirmation exists, the system will take you to the operation overview containing the confirmations, as shown in [Figure 5.39](#).

| Display Production Order Confirmation: Operation Overview | | | | | | | | | | |
|---|--------------------------|-------------------------------|-------|------|-----------------------------|------|------|--------------------------|--------------------------|--------|
| Order | | 1000348 | | | | | | | | |
| Material | | TS422_FG101 | | | | | | | | |
| Material Descr. | | Finished Material-TS422_FG101 | | | | | | | | |
| System Status | | REL | MSPT | PCNF | PRC | CSER | SETC | | | |
| | | | | | | | | | | |
| Operation/Counter | M. | Quantity | Scrap | U... | OprShrtTxt | C | .. | R. | F. | Typ... |
| - 0010 | | 10 | 0 | PC | Assembly | | | | | |
| • | <input type="checkbox"/> | 1 | | 5 | 0 PC | | | <input type="checkbox"/> | <input type="checkbox"/> | 1 |
| - 0020 | | 10 | 0 | PC | Final Acceptance | | | | | |
| • | <input type="checkbox"/> | 1 | | 5 | 0 PC | | | <input type="checkbox"/> | <input type="checkbox"/> | 1 |
| - 0030 | | 10 | 0 | PC | Packaging | | | | | |
| • | <input type="checkbox"/> | 1 | | 5 | 0 PC | | | <input type="checkbox"/> | <input type="checkbox"/> | 1 |
| - 0040 | | 10 | 0 | PC | Posting GR (with opt. Se... | | | | | |

Figure 5.39 Display Confirmations

- Cancellation of confirmations**

If you entered the confirmation incorrectly and need to cancel it, you use Transaction CO13. While canceling the confirmation, the system uses the posting date of the confirmation as the cancellation date.

[!] Warning

You can only reverse the confirmation cancellation by reentering the confirmation.

5.6.5 Goods Receipt

After all the operations are completed and the production process is finished, the produced materials should be put into stock. This process increases the stock in the warehouse, and the system

stock/inventory will be increased by way of GR posting against the production order. Goods movement 101 is used for this purpose.

With GR posting, the system increases the inventory of the product and updates the **Delivered Quantity** field in the production order. If the GR is performed for a partial quantity, the system updates the production order status as **PDLV**; if the GR is performed for a complete quantity, the status is updated to **DLV**. The actual costs are calculated and credited to the production order. Material documents and finance documents are generated, and the production order is deleted from the **Stock/Requirements List** and from the **Product** view.

[»] Note

To post GR, it's not necessary to post the confirmation. The production order must have the status **REL**.

GR can be posted automatically or manually. Automatic GR reduces the manual effort and can be triggered along with confirmation of the last operation of the production order. You can make automatic GR settings in two objects, as shown in [Figure 5.40](#):

- Control key

- Prod. Sched. Profile

Change View "Control Keys for Operations": Details

Control key: YB03 Auto Gr,Cost,Print,Sched,Conf

Indicator:

| | |
|---|--|
| <input checked="" type="checkbox"/> Scheduling | <input checked="" type="checkbox"/> Print Confirmation |
| <input checked="" type="checkbox"/> Det. Cap. Reqrnts | <input checked="" type="checkbox"/> Print |
| <input type="checkbox"/> Insp. Char. Required | <input checked="" type="checkbox"/> Cost |
| <input checked="" type="checkbox"/> Automatic GR | <input type="checkbox"/> Sched. External Op. |
| <input type="checkbox"/> Print Time Tickets | <input type="checkbox"/> Not Relevant for MES |
| <input type="checkbox"/> Rework | |

External Processing: Internally processed operation

Confirmations: 2 Confirmation required

Call Up Long Text

Change View "Production Scheduling Profile": Details

Plant: 1710 Plant 1 US

Prod. Sched. Profile: YB0001 MTS - FG - Pod. Sch. Profile

Automatic Actions:

| | |
|--|--|
| On Creation: | On Release: |
| <input type="checkbox"/> Release | <input type="checkbox"/> Execute Printing |
| <input type="checkbox"/> Document Links - Material | <input checked="" type="checkbox"/> Schedule Order |
| <input type="checkbox"/> Document Links - BOM | <input type="checkbox"/> Document Links - Material |
| | <input type="checkbox"/> Document Links - BOM |
| | <input type="checkbox"/> Create Control Instructions |

Material Availability Check: Confirm Available Partial Qty

Goods Receipt: Automatic Goods Receipt

Figure 5.40 Automatic GR Settings

[»] Note

You don't need to have a final confirmation to post automatic GR, as automatic GR is posted with partial confirmation as well.

As shown in [Figure 5.41](#), the Goods Receipt tab page in the production order holds key information. GR can be posted to unrestricted stock, quality stock, or blocked stock.

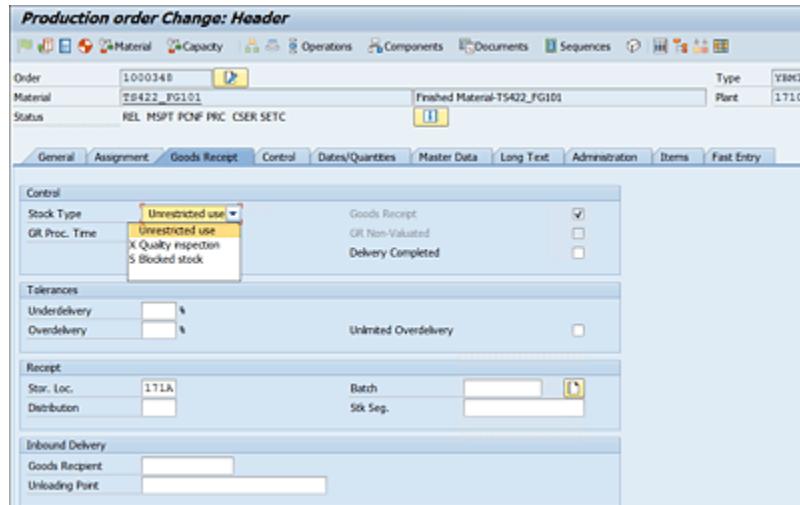


Figure 5.41 Production Order: GR Information

Whether GR can be posted for a production order or not is determined by the **Goods Receipt** indicator. The **GR Non-Valuated** indicator is derived from the material type or the account assignment to the production order. This specifies whether the GR will be posted to valued stock or nonvaluated stock. The **Delivery Completed** indicator specifies whether the planned production order quantities are delivered or not. The system sets this indicator after the GR is posted for full quantity. This indicator can be set manually also. After the indicator is set, from the system perspective, there is no open quantity. The tolerance information is picked from the **Work Scheduling** view of the material master. This **Underdelivery/Overdelivery %** indicates whether GR can be more or less than the planned quantity. The system won't allow overdelivery unless the **Overdelivery %** is set or the **Unlimited Over Delivery** checkbox is selected.

5.7 Settlement and Order Completion

Production order costing is a function of management accounting, generally referred to as order-based cost object controlling (COC). But production planning consultants should also understand the costing process. The planned costs of a production order are calculated based on cost estimate with quantity structure, whether the calculation is based on the BOM and routing of the material. Material costs are calculated based on the individual component quantity from the BOM and the price from the material master. The conversion cost or in-house production cost is calculated from the routing operation standard values and the work center formulas for activities. Additional overhead costs are added to form the planned cost. In the next subsections, we'll discuss the *settlement* which is a prerequisite step for *production order completion*. Both steps are mandatory for archiving and deleting production orders, which will be discussed in the next section.

5.7.1 Settlement

During the production process, the actual costs are accumulated in the production order. These costs include component costs from the GI, the in-house production costs from the confirmations of activities, and the GR after the production is completed. After the GR is performed, and the product is delivered to the warehouse, the production order is credited, and the material stock account is debited. The price posted is calculated based on the price specified in the material master. The accumulated costs in the production order will be settled.

When a production order is created, the settlement rule is assigned that specifies the recipient of the costs, as shown in [Figure 5.42](#). In this case, the **Settlement Receiver** is the material (the material's stock account), the settlement share percentage is **100.00 (%)**, and the **Settlement share** is full (**FUL**).

| Maintain Settlement Rule: Overview | | | | | | | | | | | | | |
|------------------------------------|---------------------|-------------------------------|--------|-----------------|--------|------|-----|--|--|--|--|--|--|
| | | | | | | | | | | | | | |
| Order | 1000348 | Finished Material-TS422_FG101 | | | | | | | | | | | |
| Actual settlement | | | | | | | | | | | | | |
| Distribution rules | | | | | | | | | | | | | |
| Cat | Settlement Receiver | Receiver Short Text | % | Equivalence No. | Set... | S... | No. | | | | | | |
| MAT | TS422_FG101 | Finished Material-TS422_FG101 | 100.00 | | FUL | 1 | | | | | | | |
| | | | | | | | | | | | | | |

Figure 5.42 Production Order: Settlement Rule

The settlement process is performed as a periodic activity, generally at the month end. So, the process itself is called a period-end or month-end process. The steps in final costing for the production order must be followed sequentially, as shown in [Figure 5.43](#).

The steps include the following:

1. Template Allocation

This is a technique used to allocate the business process costs to the order.

2. Revaluation of Actual Prices

This step is to allocate the actual activity price calculated.

3. Overhead

This step is to allocate overhead costs to orders.

4. Preliminary Settlements for Co-Products, Rework

If you are manufacturing co-products, this step settles the costs and distributes them from the order to the order items.

5. Work in Process

This is the unfinished production costs calculated according to the status of the operations confirmed.

6. Variances

The variances calculation is between the target costs and the actual costs.

7. Settlement

This step is to settle the difference between the debit and credit of the order, which is transferred to financial accounting.

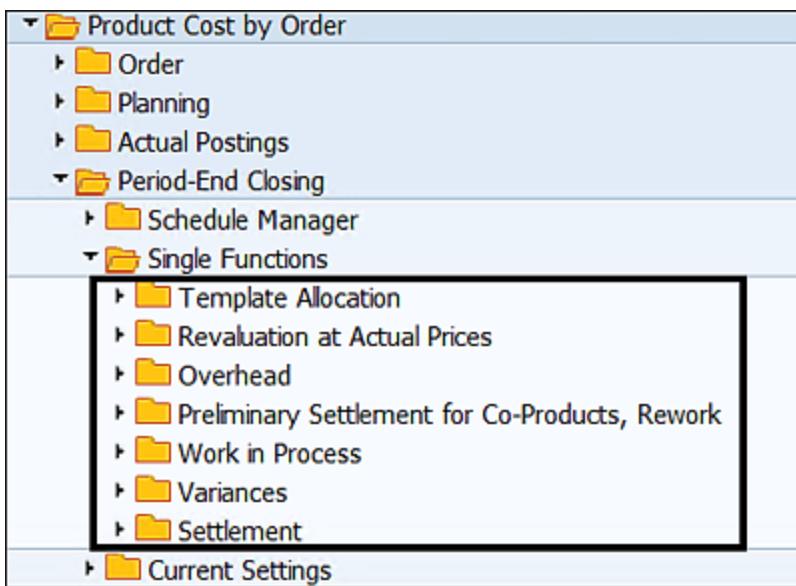


Figure 5.43 Steps in Final Costing for the Production Order

5.7.2 Production Order Completion

After the production order quantity is produced, and the produced material is put to stock, the order must be completed explicitly. Otherwise, the production order will remain open, and changes are possible. Completion of a production order can be logically divided into logistical completion and accounting-based completion.

To complete the production order logically, you can set the status to technical completion (**TECO**). This status can also be set when the production order is stopped, and you no longer want to proceed with the production. With this status set, it's not possible to change the production order interactively. You must revoke the technical completion, and only then can you make any changes to production orders. With this status set, the production order won't be relevant for MRP. All the reservations and capacity requirements are deleted. The order and the operations will be set with technically completed (**TECO**) status. Technical completion status can be set by accessing **Functions • Restrict Processing • Complete Technically**. The technical completion can be revoked/reversed if you want to make any changes to the order.

[»] Note

After technical completion, the goods movements and confirmations can be posted to the order.

With the close/complete production order status, the order won't be relevant logically and financially. With this status set, the order can't receive any costs; that is, goods movements and confirmations aren't possible. The prerequisites to set this status is that the production order should have either the **REL** or **TECO** status. The balance on the order should be "0", meaning there are no open items such as purchase requests, purchase orders, or commitments. The settlement of the order must be complete. To set the complete status, follow the menu path **Functions • Restrict Processing • Close**.

5.7.3 Archiving and Deletion of Production Orders

Production orders for which processing is over can be archived and deleted after their defined period in Customizing (**Residence Time 1** and **2** in the **Order Types** settings in Transaction OPJH) is over. Archiving object PR_ORDER is used to perform this activity. The archiving activity comprises the following steps:

1. Activate the deletion flag (**DLFL**) in the order. The prerequisite for the deletion flag is that the order should have either been delivered (**DLV**) or technically completed (**TECO**), the settlement process should have been completed, and there are no costs on the order.
2. Activate the **Deletion** indicator in the order. The prerequisites of the **Deletion** indicator are to already have the order status as **DLFL** (deletion flag), and the **Residence Time 1** (in calendar months) must have elapsed after the **DLFT**. The deletion flag can't be revoked. The **Deletion** indicator can be set for the orders with program PPARCHP1.
3. Execute an archiving run. Only after the **DLT** status is set, and **Residence Time 2** is elapsed, the archiving run can happen. The production orders will be archived with program PPARCHA1.
4. Execute a deletion run. The production orders will be deleted from the database with program PPARCHD1. After the orders are archived and deleted, these orders can be displayed with the retrieval function.

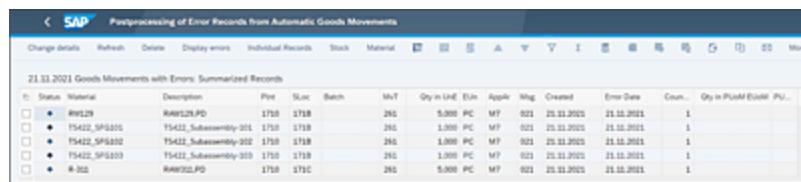
5.8 Additional Topics in Production Orders

In these additional topics subsections, we'll cover one of the most important topics: *reprocessing failed goods movements*. You can reduce the administrative processing of difference transactions by automating the goods movements along with the confirmations, but sometimes there will be errors in the automatic goods movements. Here, we'll discuss how to handle and reprocess the errors in goods movements. The next topic is the important reports available in both SAP GUI and SAP Fiori.

5.8.1 Reprocessing Failed Goods Movements

During confirmation posting, you can automatically post the goods movements for backflushing components assigned to the operations (**Backflushing** indicator maintenance is discussed in [Section 5.6.3](#)) or if you've activated the **Automatic Goods Receipt** option in the control key of the last operation. These automatic goods movements may go into errors for various reasons, such as not enough component quantity in stock in the specified storage location, the material is blocked for physical inventory, posting period issues, or authorization issues.

The failed goods movements will be collected in table `AFFW` and can be seen as line items in the SAP GUI Transaction COGI or with the same transaction code in SAP Fiori, as shown in [Figure 5.44](#).



The screenshot shows a SAP Fiori application window titled "Postprocessing of Error Records from Automatic Goods Movements". The table displays "21.12.2021 Goods Movements with Errors: Summarized Records". The columns include: Status, Material, Description, Pmt, StLoc, Batch, MvT, Qty in Unit, EUn, Apple, Wng, Created, Errr Date, Cours., and Qty in PUs/M (EUnit, PU). The table contains several rows of error records, each with a checkbox and a blue diamond icon in the first column. One row is highlighted in yellow.

| Status | Material | Description | Pmt | StLoc | Batch | MvT | Qty in Unit | EUn | Apple | Wng | Created | Errr Date | Cours. | Qty in PUs/M (EUnit, PU) |
|--------------------------|-----------------|----------------------|------|-------|-------|-------|-------------|-----|-------|------------|------------|-----------|--------|--------------------------|
| <input type="checkbox"/> | • RH129 | RH129.PD | 1710 | 171B | 295 | 5,000 | PC | M7 | 021 | 25.12.2021 | 21.12.2021 | 1 | | |
| <input type="checkbox"/> | • TS422, SP0300 | TS422_Subassembly-01 | 1710 | 171B | 295 | 1,000 | PC | M7 | 021 | 25.12.2021 | 21.12.2021 | 1 | | |
| <input type="checkbox"/> | • TS422, SP0302 | TS422_Subassembly-02 | 1710 | 171B | 295 | 1,000 | PC | M7 | 021 | 25.12.2021 | 21.12.2021 | 1 | | |
| <input type="checkbox"/> | • TS422, SP0303 | TS422_Subassembly-03 | 1710 | 171B | 295 | 1,000 | PC | M7 | 021 | 25.12.2021 | 21.12.2021 | 1 | | |
| <input type="checkbox"/> | • R-302 | RH032.PD | 1710 | 171C | 295 | 5,000 | PC | M7 | 021 | 25.12.2021 | 21.12.2021 | 1 | | |

Figure 5.44 Postprocessing of Error Records from Automatic Goods Movements

These error records can be corrected manually, and the goods movements can be posted directly from this transaction. These regular errors can be corrected by scheduling a background job for program CORUPROC at regular intervals. It's a good practice to check for errors due to automatic goods movements by regularly going into Transaction COGI and correcting any remaining errors, as it's not possible to correct all the errors with this background job.

5.8.2 Reporting Functions

Various reporting functions are available for discrete manufacturing. The most important SAP Fiori apps are listed here:

- **Manage Production Orders**

As shown in [Figure 5.45](#), this app provides an overview of the production orders based on system statuses. This report provides all the information needed to resolve any issues, allowing you to navigate to various segments of an order. With this report, you can see and access the progress of the orders, make edits, change the dates and quantities, and read master data. You can drill down

to see further details of the order and navigate to resolve any issues.

The figure consists of two screenshots of the SAP Manage Production Orders app. The top screenshot shows a list of orders with various filters applied. The bottom screenshot shows a detailed view of order 1000444, including components, coverage overview, and operations schedule.

Top Screenshot (Orders List):

- Status: Delivered & More
- Issue Type: No Filter
- Delay Duration: 1 to 0 Hours
- Order: TS42P
- Material: TS42P
- Scheduled Start: 10:00 AM
- Production Plan: 10:00 AM

Bottom Screenshot (Order Details):

- Components:**
 - Material: 84002590, Quantity: 8000 PC, Status: Consumed
 - Total Quantity: 8000 PC, Open Quantity: 8000 PC, Coverage: 100%
- Coverage Overview:**

| Category | Quantity |
|-------------------------|----------|
| Consumed | 0 PC |
| Committed - On Hand | 0 PC |
| Committed - Not on Hand | 0 PC |
| Uncovered | 8,000 PC |
- Order Schedule:**

| Operation | Work Center | Progress | Status | Scheduled Start | Actual Start | Scheduled End | Actual End |
|---|-------------|-----------------|-----------|-------------------------|-------------------------|-------------------------|-------------------------|
| 0001 Assembly | ASSEMBLY | 100% (0 of 100) | Confirmed | Sun, Nov 21, 2021 08:07 | Sun, Nov 21, 2021 01:24 | Tue, Nov 23, 2021 09:28 | Tue, Nov 23, 2021 01:18 |
| 0002 Final Appearance | TESTING | 0% (0 of 100) | Released | Tue, Nov 23, 2021 20:46 | | Thu, Nov 25, 2021 11:35 | |
| 0003 Packaging | PACK1 | 0% (0 of 100) | Released | Thu, Nov 25, 2021 11:31 | | Sat, Nov 27, 2021 12:18 | |
| 0004 Posting GR (with opt. Serial/No assign.) | TESTING | 0% (0 of 100) | Released | Sat, Nov 27, 2021 12:16 | | Mon, Nov 29, 2021 13:05 | |
- Confirmation:** Order Confirmations

Figure 5.45 Manage Production Orders App

- **Manage Production Operation**

Like the Manage Production Orders app, shown in the previous figure, the Manage Production Operations app is a handy report for production supervisors. This app provides access to the progress of operations or details of operations, and the ability to resolve any issues ([Figure 5.46](#)). If there are any issues, such as quantity deviations or quality deviations, delays, or missing components, they will be highlighted. Numerous filtering options are available to focus on the problem areas and find appropriate resolutions. In general, you can select the highlighted objects, such as material, work center, order, or status, and navigate with a popover screen for further details of these specific objects.

- **Scrap Reason**

This app can be used for analyzing the scrap generated in the production processes. Various kinds of analysis can be performed on reason for variance, work center, material, and so on. You can navigate to find specific details in this report and export the details

to Microsoft Excel, for example, and analyze further. The report output is shown in [Figure 5.47](#).

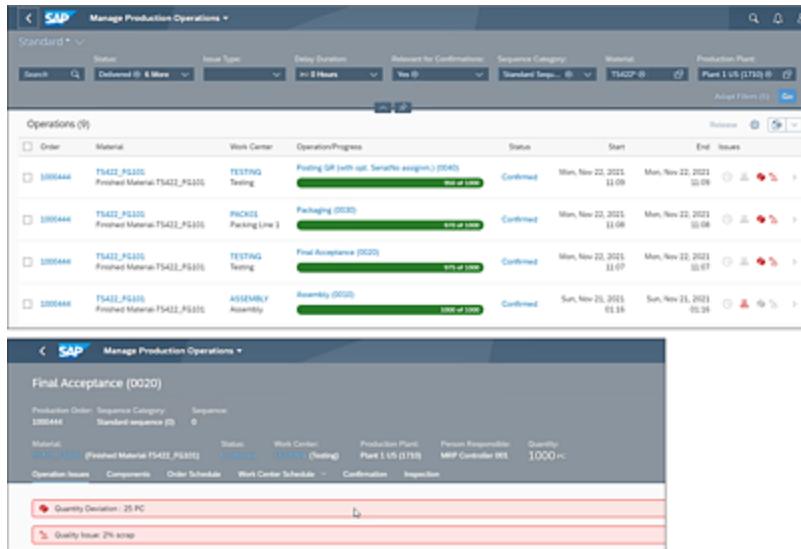


Figure 5.46 Manage Production Orders App

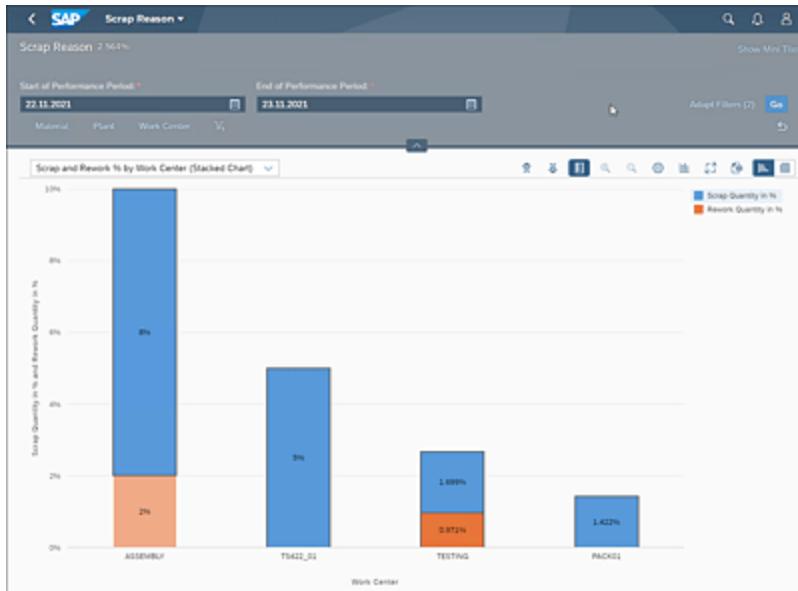


Figure 5.47 Scrap Reason App

Other important reports in discrete manufacturing include the following:

- Order Information System (report COOIS)

- Missing parts Info System (report CO24)
- Order Progress Report (report CO46)
- Production Notes (report CO1F)

5.9 Important Terminology

In this chapter, the following terminology was used:

- **Availability check**

This process makes sure the components needed for planned orders or production orders are available. Availability checks can be performed for capacities and PRTs.

- **Backflush**

In discrete manufacturing, the automatic consumption of components can be performed along with posting of operation/order confirmations.

- **Closing production order (CLSD)**

After all the logistics operations and financial settlements are posted, the status must be set to **CLSD**. This ensures that there are no open documents or costs on the order. The prerequisite to set an order to **CLSD** is to have the order status as released (**REL**) or technically completed (**TECO**).

- **Confirmation**

The confirmation is one of the order monitoring mechanisms. With confirmations, yield quantities, scrap, and activities can be posted. Confirmations can be partial confirmations or final confirmation.

The customization settings for confirmation parameters can be set such that the automatic final confirmation can be posted, meaning you don't have to remember whether the confirmation is a partial or a final confirmation. The system will check and determine this for you.

- **External processing**

This refers to outsourcing some of the operations processing in a

production order to an outside company. To identify an operation as an external operation, you have to maintain the appropriate control key, which should indicate that it's an externally processed operation. The system will create purchase requisitions for the external operations.

- **In-house production time**

This is maintained in the material master and specifies the number of days it takes to produce a material in-house. It's independent of the order quantity. The system uses this information to determine the basic dates of the planned order.

- **Order type**

The order type is client dependent and contains many parameters to manage production. You can create various order types for different purposes.

- **Production order**

In discrete manufacturing, work orders are managed as production orders. They can have internal numbering or external numbering. It contains the quantity, dates/times, needed components and applicable operations, and so on.

- **Scrap**

The is the quantity of material that can't be used further due to nonconformance to quality even after rework has been performed and unsuitability for any other purpose.

- **Technical completion**

When you set an order for technical completion (**TECO**), then the order won't be relevant logically; that is, the order isn't relevant for planning, and capacities requirements and reservations are deleted. You can still post goods movements and other costs on the order with **TECO** status.

- **Trigger point**

Trigger points can be used to trigger certain functions when the status of an operation changes. Trigger points are assigned to operations.

5.10 Practice Questions

These questions will help you evaluate your understanding of the topics covered in this chapter. They are similar in nature to those on the certification examination. Although none of these questions will be found in the exam itself, they will allow you to review your knowledge of the subject. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers and only correct answers to receive credit for the question.

1. During an SAP S/4HANA implementation project, the production and operations team wanted to implement discrete manufacturing, but the finance and management accounting teams wanted to simplify the finance and month-end closing processes by implementing cost object controlling by period method. Which statements are correct? (There are three correct answers to this question.)
 - A.** If the manufacturing process represents repetitive manufacturing (REM), then implement REM and cost object controlling by period can be implemented.
 - B.** If the manufacturing process is workshop based, then implement the production order scenario, and if cost object controlling is order based, costs are managed at the order header level, and a settlement rule is assigned there.
 - C.** Cost object controlling by period for the production order scenario can be implemented by maintaining the use of the product cost collector (PCC) as a cost object.
 - D.** For the production order scenario, product cost by period can't be implemented.

2. The end user is working on a production order but can't post GI for the order, encountering error message **Current order status does not allow goods withdrawals**. The user then tried to confirm the order and again encountered an error **The Order is not released**. What is the next course of action the user should take?
- A.** Try to post GR, and the error may be resolved.
 - B.** First, print the shop floor papers.
 - C.** First, release the order.
 - D.** Delete the order because there are so many errors in it.
3. Which of the following isn't a method of creating a production order?
- A.** In-assembly processing for sales order by using strategy group 82
 - B.** Create without material
 - C.** Create for project
 - D.** Create for company code
4. In SAP S/4HANA, the production version is a mandatory object and is the primary source of supply for in-house production. Which statement is correct?
- A.** The routing and BOM selected for the production should not be set to the **Deletion** flag.
 - B.** The lot-size range of the production version can be over the lot-size range of routing.
 - C.** Only the routing validity period should be within the validity period of the production version; the BOM validity period isn't a concern.

- D.** SAP decided to roll back the decision of the production version as the source of supply for manufacturing from SAP S/4HANA release 2020.
5. True or False: Production orders are always created by using basic date scheduling. When the order is released, then the lead-time scheduling is carried out automatically, and operation dates and times to the seconds are determined.
- A.** True
 - B.** False
6. Which of the following isn't considered for overall duration of an operation?
- A.** Wait time
 - B.** Setup time
 - C.** Queue time
 - D.** Processing time
 - E.** Move time
 - F.** Teardown time
7. What is the difference between the earliest dates and latest dates of an operation?
- A.** Wait time
 - B.** Setup time
 - C.** Queue time
 - D.** Processing time
 - E.** Teardown time
8. With reference to the material availability check, which of the following statements are correct? (There are two correct answers to this question.)

- A.** The material availability check is always performed automatically.
 - B.** When there is a material shortage, the system sets the status **MSPT** (material shortage).
 - C.** You can check missing parts information by accessing Transaction COOIS.
 - D.** The scope of check is determined for each component.
9. What are all the activities performed when you post GI? (There are two correct answers to this question.)
- A.** Component stock/inventory will be reduced (both at the storage location and plant level).
 - B.** Consumption statistics will be updated with the GI quantity.
 - C.** The reservation is increased by the GI quantity.
 - D.** With GI posting, the material document will be created, but the finance postings will happen only after the final confirmation of the production order.
10. Which of the following statements are correct? (There are two correct answers to this question.)
- A.** The shop floor papers are classified as operation-related slips, component-based slips, and multipurpose slips.
 - B.** You can print the papers when the order is in **Created** status.
 - C.** Original print and reprint are the two modes available for printing.
 - D.** You can only print the shop papers in the background.
11. Which material master view is mandatory to enable discrete manufacturing?
- A. MRP 4 view**

- B.** Work Scheduling view
 - C.** Advanced Planning view
 - D.** Accounting 1 view
12. In your SAP S/4HANA implementation project, you want to optimize the production process steps, automate, and reduce the manual transactional process steps. Which steps can you automate? (There are two correct answers to this question.)
- A.** Order release
 - B.** Goods receipt
 - C.** Technical completion
 - D.** Material staging
13. Which of the following steps of order execution generates financial postings?
- A.** Order release
 - B.** Goods receipt
 - C.** Material staging
 - D.** Material availability check
14. Which of the following is the integration between production and management accounting?
- A.** BOM
 - B.** Work center
 - C.** Routing
 - D.** Production version
15. With reference to confirmations, which statements are correct? (There are three correct answers to this question.)
- A.** With milestone confirmation, the preceding operations and suboperations will be confirmed until the next milestone operation.

- B.** The standard value key maintained in the work center determines whether an operation is relevant for confirmation or not.
 - C.** For progressive confirmation, you can perform confirmation at the end of the day
 - D.** By default, you can perform only partial confirmation while performing milestone confirmation.
 - E.** Capacity requirements will be completely reduced when you perform final confirmation.
16. With reference to GR, which statements are correct? (There are three correct answers to this question.)
- A.** GR can be manually or automatically posted for an order.
 - B.** Confirmation is the prerequisite step before GR. You can post GR for the quantity you finally confirmed.
 - C.** The **Delivery Completed** indicator in the **Goods Receipt** tab page of the production order is set after the GR for the full quantity is posted.
 - D.** The automatic GR can be posted only with final confirmation. With partial confirmation, automatic GR won't be posted.
 - E.** With GR, the system updates the **Delivered Quantity** field in the production order.
17. With reference to costing and settlement, which statements are correct? (There are three correct answers to this question.)
- A.** The actual costs are accumulated on the production order.
 - B.** WIP or variances can be settled during the settlement process.

- C.** The in-house production/conversion costs can only be captured as overheads in order-based cost object controlling.
 - D.** The production order can be settled only during the month-end process.
 - E.** Materials can be a cost receiver in the production order scenario.
18. With reference to archiving and deletion, which statements are correct? (There are two correct answers to this question.)
- A.** Setting the deletion flag (**DLFL**) is the first step.
 - B.** The only restriction for setting the deletion indicator (**DLT**) is to have the order with **DLFL**.
 - C.** Residence time 2 should have passed after setting the deletion indicator to archive the orders.
 - D.** The prerequisite for setting the deletion flag is to have closed (**CLSD**) status.
 - E.** It's not possible to display the orders after they are archived and deleted.

5.11 Practice Answers and Explanations

1. Correct answers: A, B, and C

Cost object controlling by period can also be implemented for production orders by maintaining the **Use PCC as cost object** in order-type-dependent parameters for this specific order type. For all the production orders of this order type, all the costs are collected at the PCC). The WIP and variance calculation will be done by period. The preliminary costing, simultaneous costing, and final costing are performed at the PCC level. Now as a consultant, you should understand the manufacturing type and suggest accordingly; then, consider and evaluate the reason for this request.

2. Correct answer: C

Based on the errors, the order is still in created (**CRTD**) status. With the created status active, it's not possible to start any logistic processes on the order, which means confirmations can't be posted. It's not possible to post goods movements, and it's not possible to print shop floor papers. So, the first thing the user should do is to release (**REL**) the production order.

3. Correct answer: D

You can create production orders automatically while creating sales orders by using the assembly processing planning strategy 82. With Transaction CO07, a production order can be created without a material. The production order can be created for a project with Transaction CO10. In fact, all the

production orders are created at the plant level, but there is no method to create a production order for a company code.

4. Correct answer: **A**

The first statement is correct. The BOM and/or routing contained in the production version should not be set to the deletion flag. Ensure that the BOM and routing validity is correct throughout the validity period of the production version. The lot-size range of the production version must be within the lot-size range of both the BOM and routing. Ensure that the production version check is performed.

5. Correct answer: **B**

Lead-time scheduling is always used for production orders. At the time of creation itself, the system will perform lead-time scheduling. For planned orders, you have the option of basic date scheduling or lead-time scheduling.

6. Correct answer: **E**

The overall duration of an operation contains queue time, setup time, processing time, teardown time, and process-specific wait time. Move time is an interoperation time and is allocated to the preceding operation.

7. Correct answer: **C**

Queue time is the time between the earliest dates and latest dates. This acts as a buffer for the start of operation.

8. Correct answers: **B and D**

A material availability check can be performed both interactively and automatically. According to the scope of check (combination of checking group and checking rule), which

stocks and what movements will be considered during ATP check and the available stocks at the requirements date are committed to the order. If there is a shortage, the system sets the system status as **MSPT** (material shortage). You can use missing parts info system (Transaction CO24) to check the missing parts.

9. Correct answers: **A and B**

When the components are available, they can be withdrawn for the production order. The system uses movement type 261 for GI posting. With this movement type, material documents will be created and financial postings made into material stock and consumption accounts. The stock quantity of the components will be reduced in inventory management, and the consumption statistics will be updated with the GI quantity. The order reservations will be reduced by the GI quantity.

10. Correct answers: **A and C**

The production order should be released before you start printing shop floor papers. There are two modes of printing: original print, and reprint. You can print the shop papers interactively and in the background. The shop papers are broadly classified as operation-related, component-related, and multipurpose slips.

11. Correct answer: **B**

The **Work Scheduling** view is required for enabling discrete manufacturing. This view contains important information for production scheduling data, such as production scheduler, production scheduling profile, serial number, and batch-management-related information. Lot-size-dependent and lot-size-independent information of MRP views contains planning-

relevant data for both in-house production and external procurement. If you want to plan the materials with the production planning and detailed scheduling (PP-DS) component, then maintaining the **Advanced Planning** view is required. Accounting is only relevant for financial postings and valuation-related data, including the valuation class.

12. Correct answers: A and B

Upon creation of the production order, the release can be automated, and automatic GR can be activated with customization settings for the production scheduling profile (Transaction OPKP). Automatic GR can also be automated by having a control key with automatic GR checked. Technical completion and material staging can be performed in the background but can't be performed automatically.

13. Correct answers: B and C

The financial postings will be performed with the GR posting, and general ledger accounts will be updated. The system captures these postings by generating financial posting documents. The other transactional steps aren't relevant for financial postings. Apart from GR, GI and settlement processes will also trigger financial posting.

14. Correct answer: C

The work center holds the information related to controlling/management accounting. The controlling area and cost center are assigned in the work center. The activity types are also assigned, and the formulas are defined. These activity types are assigned in the routings for the cost calculation.

15. Correct answers: A, C, and E

The advantage of milestone confirmation is that all the preceding operations and suboperations will also be confirmed along with a milestone confirmation. The control key holds the information-related operation confirmations and determines other relevant process steps. With progressive confirmation, you confirm an operation that you've reached, for example, at the end of the day to report the progress of an order. You can perform a partial confirmation or a final confirmation. You can also choose an automatic final confirmation, with the system internally checking whether the operation is partially or finally confirmed. Yes, capacity requirements will be reduced with confirmations.

16. Correct answers: **A, C, and E**

GR can be posted manually or automatically. Automatic GR settings can be maintained in the control key or in the production scheduling profile. The execution steps, confirmation, and GR are disconnected in SAP for greater flexibility. With GR posting, the system will update the **Delivered Quantity** field in the production order header. At the same time, if the GR is posted for full quantity, then the **Delivery Completed** indicator will be set. If the automatic GR is activated, then automatic GR will be posted with both final confirmation and partial confirmation.

17. Correct answers: **A, B, and E**

Actual costs from GIs and activity confirmations will be accumulated on the production order. One of the primary objectives of the settlement process is to settle the WIP or variances. In-house production costs can be considered as overheads, but that isn't necessarily the only scenario. Production orders can be settled at any point in time; it doesn't

need to be at the end of the month or during month-end processes. Materials are valid cost receivers in the production order scenario.

18. Correct answers: **A and C**

In the archival and deletion process, the first step is to set the order with the deletion flag (**DLFL**). A prerequisite for this is to have the order with the status of delivered (**DLV**) or technically completed (**TECO**). The prerequisite for having the deletion indicator (**DLT**) is to have the order already set with the deletion flag (**DLFL**), and residence time 1 must be elapsed after setting the **DLFL** status. **Residence Time 1 and 2** are set in the customization for the production order type (Transaction OPJH) and is maintained in calendar months. Even though the orders are archived and deleted, you can still display the orders via the retrieval functions.

5.12 Test Takeaway

In this chapter, you learned that discrete manufacturing can be broadly subdivided into order preparation, order execution, and order closure. This chapter is built on the master data needed and the customization base. Discrete manufacturing is tightly integrated with other modules such as sales and distribution for receiving the requirements, materials management for purchasing raw materials, subcontracting, external operation, and inventory management.

Quality management is embedded in discrete manufacturing.

Finance and management accounting are tightly integrated, making order-based cost object controlling and period-based cost object controlling possible. This is one of the most important chapters, and you can expect many questions in the certification exam on these topics. With SAP S/4HANA, many SAP Fiori apps are introduced for transaction processing, reporting, and KPI monitoring. Having familiarity with these topics will be helpful in certification and in implementation projects.

5.13 Summary

In discrete manufacturing, you handle and manage production orders. We discussed the important master data objects and the settings needed for executing the processes. In SAP S/4HANA, the production version is a mandatory master data object, which is the source of supply in manufacturing scenarios. Discrete manufacturing is the most widely used production type, so we discussed the standard customization settings that drive the processes in combination with master data. Planned orders can be converted to production orders, or you can create them manually if needed. You should think carefully and understand when to release the production orders for further execution on the shop floor. Production execution starts with ensuring and having the needed components, consuming them, adding value, and producing the assemblies. You should understand the various options to streamline and reduce the administrative processing of transactions end to end. After you complete the production execution, settlement, and month-end closing, make sure that the production orders are no longer relevant for any further processing by closing them and subsequently archiving and deleting them from the SAP S/4HANA system. In the next chapter, we'll discuss lean manufacturing, especially repetitive manufacturing and kanban.

6 Lean Manufacturing

Techniques You'll Master

- Understand repetitive manufacturing (REM) and characteristics
- Maintain master data for REM
- Plan and perform line loads with the planning table
- Customize the REM profile
- Product costing with the product cost collector (PCC)
- Kanban and kanban control concepts

In this chapter, we'll explain the REM production method and kanban. Both are categorized as *lean manufacturing*. The unique nature of run schedule quantities, line loading features, and the ease with which planners can manage the production plans and create the orders has simplified the production confirmation process and period-based costing.

Real-World Scenario

Even though the lean manufacturing concepts were developed in the 1980s, these concepts are increasingly relevant in the current business environment, including simplicity, better control, ease of operation, and reduced burden of transaction processing on business users. REM in combination with kanban can be a good example of reaping the benefits of lean principles, which are readily available with SAP S/4HANA. Flow manufacturing and takt-based scheduling with kanban will greatly reduce waste and

promote flow. The out-of-the-box tools available can be adapted easily to the unique requirements of the organization. Consultants or responsible business users must have a good understanding of the REM characteristics, philosophy, and details. Having a good understanding of standard REM profile and the details will give a lot of insight into how best REM can be implemented in the business context. Knowledge of the manufacturing execution options and the variation of integration with other modules are tightly interconnected.

6.1 Objectives of This Portion of the Test

The purpose of this portion of the certification exam is to test your knowledge of the repetitive manufacturing (REM) production type, how master data drives the business processes, and the business processes involved in REM and the accompanying customizations. The same is true with kanban processing as well, including the business context, implementation considerations, master data, configurations, and business processes. Following are more important topics for the certification:

- Describe the most important information and control parameters in defining the REM profile, which determines the execution and confirmation of the production process.
- Describe the relevant master data and the field-level values that influence the REM processes.
- Explain the planning process, line loading, integration to capacity planning, and the relevant features of the planning table.
- Describe the REM features, characteristics, different confirmation processes and subsequent inventory management steps,

postprocessing, and error handling.

- Explain the material staging with kanban, master data, replenishment strategies, and kanban control with the kanban board.

[»] Note

The lean manufacturing in SAP S/4HANA topic makes up 8%–12% of the total exam.

6.2 Repetitive Manufacturing Overview

In this section, we'll examine the characteristics of repetitive manufacturing (REM) and explain the master data needed for effective REM. We'll also discuss the Planning Table app from SAP Fiori, as well as REM confirmation and cost object controlling.

6.2.1 Characteristics

The following list describes the characteristics of REM:

- The distinct nature of REM is that the product is produced for a longer period on the production line. In some cases, the production lines are built to produce the same products or product groups, and they usually remain unchanged over a longer period. The total production quantity is produced over a certain period at a certain rate, which is called production rate or heartbeat, that is, the output or number of products per period.
- Production is based on the use of planned orders instead of production orders, so no conversion or release of planned orders is needed.
- The replenishment of components is often performed at the production lines without reference to any order.
- REM will normally involve a relatively constant flow through production lines. The bill of process, for example, rate routings, or routings of the products or assemblies in general will be simple and not vary much. The routing will have one operation; however, it's also possible to use routings with several operations.

- Simplified production confirmations are the distinctive feature of REM. In general, the completion confirmation includes goods receipt (GR) of assemblies, GI of components, and confirmation of activities together. If the business situation requires it, these steps can be decoupled.
- Period-based costing is used instead of order-based costing. The costs are collected in the PCC as product cost by period, and product is the main cost object.
- Based on the nature of production, it's possible to produce the assemblies or subassemblies with the REM production type, and the final assemblies may follow order-based production.

The steps in REM are shown in [Figure 6.1](#).

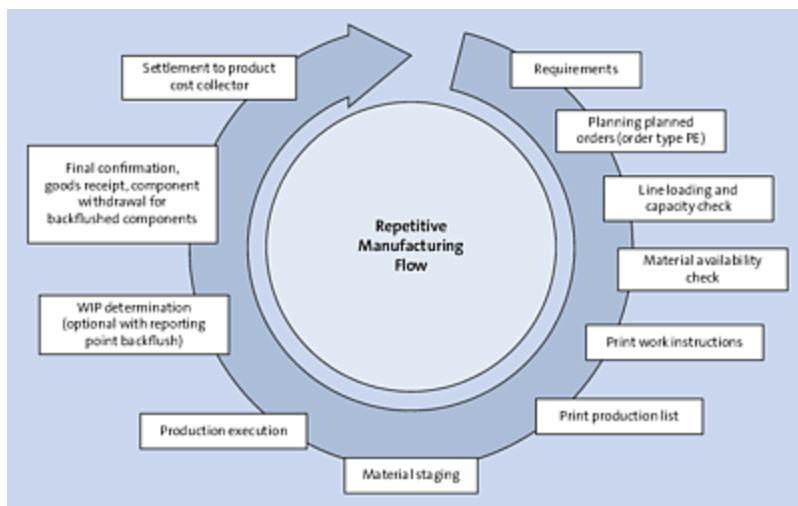


Figure 6.1 Repetitive Manufacturing Process Flow

The key characteristic of REM is the simplicity in planning, manufacturing, and reporting steps. The requirements are fed mainly as planned independent requirements (PIRs) to material requirements and the output will be running scheduled quantities created as planned orders of type PE. Line loading (or assigning appropriate quantities to production lines [production versions]) and

simultaneous capacity checks are used to see that the production quantities can be produced. Material availability check can also be performed within the planning table itself. You can print work instructions and production lists that contain operation dates and quantities. The prerequisite for production execution is material staging, which can be performed with kanban replenishment or can be transferred from the main store/warehouse to the point of use on the shop floor. Production execution happens in the shop floor, and, based on business process requirements, you can use reporting point backflush to calculate work in process (WIP). For the finished product, GR posting and simultaneous component backflush can be posted. All the costs are collected in the PCC. The settlement uses the PCC in the management accounting component of SAP S/4HANA.

6.2.2 Master Data

In this section, we'll cover the REM-specific important master data objects and relevant field-level information. The important master data objects are shown in [Figure 6.2](#).

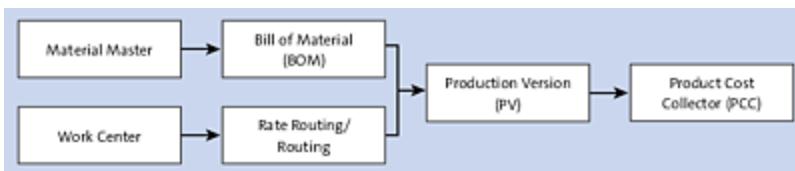


Figure 6.2 Master Data for Repetitive Manufacturing

[»] Note

In [Chapter 2](#), we discussed the master data required in production planning and manufacturing extensively.

The important REM master data objects are described in the following list:

- **Material master**

To enable the material master for REM, you maintain the settings shown in [Figure 6.3](#): set the **Repet. Manufacturing** indicator, and update the **REM Profile** in the **MRP 4** view of the material master. Creation of the REM profile is detailed in [Section 6.3](#).

It's important to allow the material for REM by setting the indicator allowing REM first in the material master and then only updating the production version with the indicator allowing REM.

If this indicator isn't set in the material master, you can't select the production version with the indicator allowing REM.

As shown in [Figure 6.3](#), another field that is important for REM is **Action Control**. This field is made available from the SAP S/4HANA 2020 release. In fact, this field was available in SAP R/3 and SAP ERP 6.0 but was removed as part of the SAP S/4HANA simplification at that time.



Figure 6.3 Material Master Fields Relevant for Repetitive Manufacturing

The action in the planned order function is applicable while interacting with external systems such as manufacturing execution systems (MES), where the actual execution of planned orders happens. This function is used to transfer progress and other dependent actions to the SAP S/4HANA system through the interface. Some standard actions are available, which can be further customized based on business needs. The standard out-of-the-box actions are shown in [Figure 6.4](#). The **Action** key, which

is to be used in the preceding **Action Control** field, can be customized with Transaction OMIV. This key defines the sequence of the actions that can be carried out for the planned order.

| Action | Description |
|--------|--------------------------------------|
| BEMA | Explode BOM; check availability |
| BFPL | Backflush planned order |
| BOME | Explode BOM |
| CPOD | Change planned order |
| DLPL | Delete planned order |
| FIKM | Firm planned order components |
| FIRM | Firm planned order header |
| MAAV | Check material availability |
| NEMA | Check availability w/o BOM explosion |
| PRNT | Print component list |
| RSMA | Reset material availability |
| SCHE | Scheduling |

Figure 6.4 Repetitive Manufacturing: Actions

For planned orders, actions can be executed with Transaction MDAC, as shown in [Figure 6.5](#). This transaction code can only be used for one planned order at a time for action control.

The screenshot shows the SAP MDAC interface titled "Execute Action for Planned Order". The top section has fields for "Planned Order" (with a checked checkbox), "Last action" (with a dropdown menu open, showing a selected item with a red border), and "New action" (empty). Below this is a section for "New planned order data" containing fields for "Order Quantity", "Scrap Quantity", "Prod. Version", "Sequence Number", "Order End Date", "Order Start", "Opening Date", and checkboxes for "Firm" and "Delete firm. ind.". The bottom section is titled "Data confirmation" and includes fields for "Posting Date", "Document Date", "Doc.Header Text", "Receiving SLoc", "To batch", "Backflush qty", "Scrap Quantity", and "Reason". To the right of these fields is a "Serial Number" table with several rows and a small toolbar above it.

Figure 6.5 Planned Order: Action Control

[+] Tip

Function module `MD_SET_ACTION_PLAF` is available for mass action control of a large number of planned orders.

- **Bill of materials (BOM)**

There is no difference in creating and maintaining a BOM for REM. In defining the BOM for the components, the issue storage location can be updated in the **Production Storage Location** field in the BOM item. This information will be used during the backflushing of components.

- **Work center/production line**

In REM, production flows through a production line, that is, a series of workstations in the line. Individual workstations don't need to be created as a work center. The entire production line can be created as a work center with the work center category as **0007 – Production Line**. Other work center categories can also be used in REM. The standard value to be selected is **SAP3 - Production Line Planning**, which is available as an out-of-the-box standard value key for REM.

This work center must be maintained as the production line in the production version and be used as the work center in the rate routing. Production lines that will include more than one work center can be modeled as a line hierarchy. Line hierarchies are mainly used in takt-based manufacturing, such as in the automotive industry.

[»] Note

Takt-based flow manufacturing is out of scope of the certification exam.

- **Rate routing/routing**

For REM purposes, rate routings are designed to use in the manufacturing of materials. The production rate, that is, production quantity per unit of time, is maintained in the rate routing. Routings can also be used in REM. Only one operation is maintained in the routing/rate routing, and the production line is maintained as the work center in this single operation.

It's important to take care of the following points in the rate routing or routing maintenance. The control key plays an important role here:

- If more than one operation is maintained in a routing/rate routing, for ease of scheduling, it's better to identify the bottleneck operation and maintain the appropriate control key, which allows scheduling for this operation.
 - To define an operation as a reporting point, it's required to set the **Confirmation** field in the control key to **Milestone Confirmation**. This is required if reporting point backflushing is used.
- **Production version**

As discussed in [Chapter 2](#), production versions are mandatory in SAP S/4HANA. As such, production versions are also mandatory for REM. The most important fields for REM are the following:

 - **REM Allowed:** If this indicator is set, then this production version is allowed for REM.
 - **Production Line:** Specifying this field with the production line is required for capacity planning and making selections in the planning table. Make sure that the same production line is maintained in the routing.
 - **Issue Storage Location:** If the issue storage location isn't maintained in the BOM, then the system will determine the issue storage location of components from the production version. It makes sense to use this function if all the components are placed in a storage location near to production and are consumed from this storage location. Further information on determining the issue storage location is provided in the “assembly backflush” bulleted item in the “Confirmation” section.
 - **Receiving Storage Location:** Maintain this field for receiving (GR) the material after the backflush function.

- **Product cost collector (PCC)**

The PCC object belongs to the controlling module, which is also called management accounting in SAP S/4HANA. Product costs are settled periodically in REM using the Product Cost by Period app in SAP Fiori.

The PCC collects the costs it has created with reference to the material, and the material/product acts as the cost object. The planned order/run schedule quantity can't collect costs; instead, it presents an opportunity for costing in the form of the decoupling scenario in SAP S/4HANA. This order type decouples the order from costing.

The PCC can be created with Transaction KKF6N as shown in [Figure 6.6](#). The controlling used for the material is the production version.

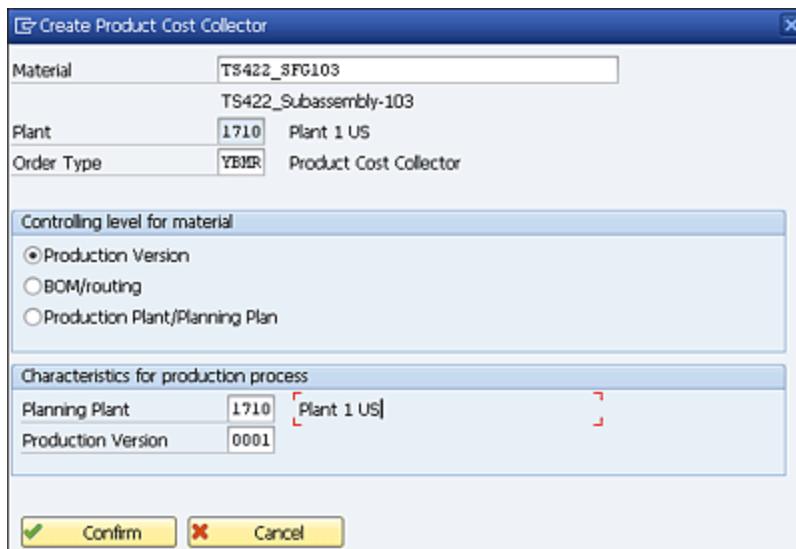


Figure 6.6 Product Cost Collector (Transaction KKF6N)

During the creation of the PCC, the system creates the preliminary costing for PCC by using the production version. If for the same material you're using more than one production version, then it's

possible to create separate preliminary cost estimates based on different production versions.

The costing process with the PCC is covered in the next sections.

6.2.3 Planning with the Planning Table

For REM, the PIRs or sales orders form the basis for planning. As discussed in [Chapter 4](#), the MRP run with MRP Live will create the run schedule quantities or planned orders with order type PE. Apart from the MRP run, planned orders can also be created manually in the **Planning Table**.

Planners can perform varieties of functions with the planning table, and it can be considered as a go-to tool for planners. The planning and line loading can be performed by accessing the planning table with Transaction MF50, by searching for the same SAP GUI Transaction MF50 in the SAP Fiori app search, or by accessing the

Manage Repetitive Manufacturing app from SAP Fiori, as shown in [Figure 6.7](#).

The screenshot shows the SAP Fiori interface for the Planning Table Initial Screen: Change Mode. At the top, there is a SAP logo and a back arrow. Below the header, there is a "More" dropdown menu. The main area contains several input fields and selection boxes:

- MRP area: [Input field]
- Plant: 1710
- Selection by production version:
 - Production line: [Input field] [Select icon]
 - WkCtr hierarchy: [Input field] [Select icon]
 - Nodes WkC.hier.: [Input field]
 - Material: TS422_SFG103 [Input field]
- Product group: [Input field]
- Class: [Input field]
- Class type: [Input field]
- MRP controller: [Input field] [Select icon]

Figure 6.7 REM Planning Table: Transaction MF50

When you scroll down on the planning table selection screen, you can make additional selections from four different tab pages, as shown in [Figure 6.8](#): Period **1**, Scheduling **2**, Control **3**, and MRP segments **4**.

The important point to consider is that you can perform **Detailed Planning** or **Sequencing** in the planning table, as shown in the **Scheduling** tab **2**. For the certification exam, only the detailed planning is in scope. When you select the **Plant** and **Material** or any other options given in the **Selection by Production Version** area

(refer to [Figure 6.7](#)) and then execute, the next screen appears, as shown in [Figure 6.9](#).

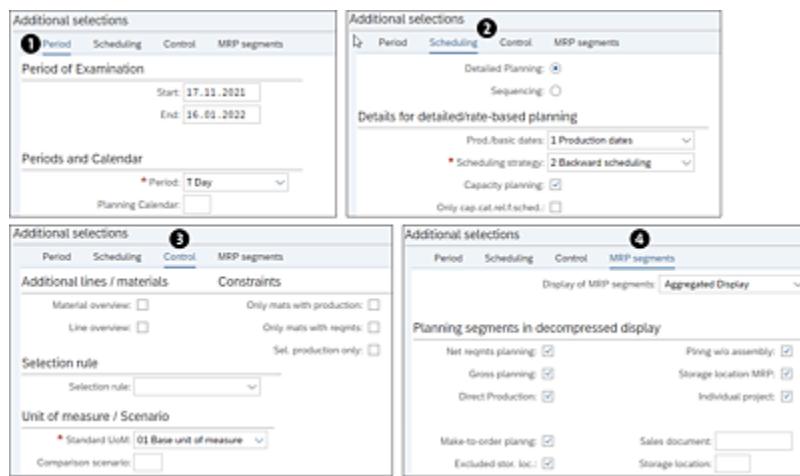


Figure 6.8 REM Planning Table: Additional Selections

The screenshot shows the SAP REM Planning Table in 'Change Mode'. The top navigation bar includes functions like 'Select block', 'Deselect All', 'Reassign', 'Move', 'Create order', 'Situation', 'Switch mode', 'Expand', 'Collapse', 'Select material', 'Select line', 'More', and 'Exit'.

The main table displays two sections:

- Total Capacity Data:** Shows capacity for period 17.11.2021 (2,292), period 18.11.2021 (131, 97%), period 19.11.2021 (100), period 20.11.2021 (19,125), period 21.11.2021 (16,643), period 22.11.2021 (MO), period 23.11.2021 (TU), and period 24.11.2021 (WE). It also lists requirements and availability for various products and versions.
- Material Data:** Shows material requirements for period 17.11.2021 (11053), period 18.11.2021 (340), period 19.11.2021 (315), period 20.11.2021 (18218), period 21.11.2021 (508), period 22.11.2021 (MO), period 23.11.2021 (TU), and period 24.11.2021 (WE). It includes columns for 'Available Quantity' and 'Not Assigned'.

Figure 6.9 Planning Table for Repetitive Manufacturing

You can perform the following functions in the REM planning table:

- Create planned orders, increase or reduce quantities, and reassign or transfer quantities to future periods.
- Transfer requirements to future periods and to different production versions/production lines.
- Directly access the capacity planning table and dispatch the quantities, carrying out the lead time scheduling of planned orders.

- Print the planning results.

6.2.4 Material Staging

Material staging is the replenishment of needed components from the supplying storage location to the issuing storage location from which the components are consumed for production. This is only a transfer of components from one location to another and not the actual consumption of components. The movement type used for material staging is 311. For material staging purposes, the pull list can be used in REM. The pull list calculates shortage quantities and triggers replenishment. To access the pull list, choose **Logistics • Production • Repetitive Manufacturing • Material Staging • Pull List - Trigger Replenishment**, or use Transaction MF60.

For this section of the text, we'll discuss using the staging type as the storage location, which means replenishment from one storage location to another storage location. After assessing the appropriate selection parameters on the pull list selection screen, the results will appear as shown in [Figure 6.10](#). Selecting the **Replenishment Elements** button (not shown in the figure) causes the bottom half of the screen to appear where you can select the **Replenishment Proposals** button and the replenishment proposal to propose the component quantities. Then you can select the appropriate

replenishment storage location and replenishment line, and click the **Stage** button to perform the material staging.

The screenshot shows the SAP S/4HANA interface for a 'Pull List: Storage Location Level'. At the top, there are tabs for 'Additional Data', 'Replenishment Proposals', and 'Available Stock'. Below these are fields for 'Plant' (1710), 'Selection period for reqmts' (24.03.2021), and three traffic light indicators (red, yellow, green). A toolbar with icons for search, print, and copy/paste is visible. The main area is titled 'Total Reqmts' and contains a table with columns: ID, Status, Pint, Material, Iss... Reqmts date, NetReq..., Avail. stock, Miss. qty, Quantity staged, Remainin..., U... Material. One row is highlighted with a green checkmark in the Status column and a green light in the traffic light. Below this is a 'Replen. Elements' section with a table for 'Stage' operations, showing a row with a green checkmark in the Status column and a green light in the traffic light.

| ID | Status | Pint | Material | Iss... Reqmts date | NetReq... | Avail. stock | Miss. qty | Quantity staged | Remainin... | U... | Material |
|------------|--------|------|----------|--------------------|-----------|--------------|-----------|-----------------|-------------|--------|----------|
| 1710 R-411 | OK | 1710 | R-411 | 171C 18.03.2021 | 515 | 250 | 265 | 265 | 0PC | RAW411 | |
| | | | | | | | | | | | |

| S | ReqElm | Pint | Material | Iss... | Re... | Quantity staged | U... | Material description | Reqmts date | S... | B... | V... | Batch | St... |
|---|--------|------|----------|--------|-------|-----------------|-----------|----------------------|-------------|------|------|------|-------|-------|
| ✓ | StkTzn | 1710 | R-411 | 171C | 171A | 265PC | RAW411,PD | 23.03.2021 | | | | | | |
| | | | | | | | | | | | | | | |

Figure 6.10 Pull List: Storage Location Level

If the material staging is successful, the system will issue an appropriate message, place a green checkmark in the replenishment element's **Status** column, and turn the total requirements **Status** traffic light green (see [Figure 6.10](#)).

[»] Note

Pull lists can also be used in discrete manufacturing and process industries.

6.2.5 Confirmation

In REM, the progress of the production is backflushed. (The terms “confirmation” and “backflush” are used synonymously.) Production in REM is periodically backflushed, but it’s also possible to backflush the production based on a planned order.

Production confirmation is simplified in REM and can be assessed by the menu path **Logistics • Production • Repetitive Manufacturing • Data Entry • MFBF - Repetitive Manufacturing Confirmation** or with the REM Confirmation app from SAP Fiori, as shown in the [Figure 6.11](#).

Figure 6.11 REM Confirmation App

With the same REM Confirmation app, it's possible to perform many of the business functions in the following list:

- **Assembly backflush**

Assembly backflush is used to backflush the finished product or the assembly. This is also called the final backflush. The assembly backflush links the following activities:

- GR for the finished product is posted. The receiving storage location maintained in the production version or the production storage location from the material master is used to post the GR. The production version will have the higher priority in determining the GR location.
- GIs for components are posted. The issue storage location for component consumption is maintained in the production

storage location of the material master, in the issue storage location in the **BOM Item – Status/Long** text view, or in the production version.

- Issue storage location is determined from the BOM item. If it's not maintained there, then the MRP group of the assembly determines whether to pick the issue storage location from the material master of the component or the production version of the assembly. This customization setting for the MRP group can be maintained in Transaction OSPK_SLOC or in the customization menu path **Production • Repetitive Manufacturing • Cross-Process Settings • Define Storage Location and Supply Area Determination in BOM Explosion**.

If a proposed issue storage location isn't maintained in the production version, then the system uses the receiving storage location of the assembly as the issue storage location of all the components.

If an MRP group isn't maintained for the assembly, then the **Production Storage Location** field maintained for the components will be used as the issue storage location.

- The BOM explosion for component determination is based on the following logic:
 - If a planned order is entered in the **REM Confirmation** screen, then the components from this planned order are selected.
 - If a revision level is entered and no planned order, then the BOM explosion is based on the revision level.
 - If neither revision level nor planned order is maintained, then the BOM explosion is based on the posting date.

- Reduction of the planned orders or run schedule quantities happens based on the REM profile customization. Whether to reduce the planned order quantities or not is determined by the REM profile settings of **Reduction of Planned Order Quantities** and the **Reduction Period**. The capacity requirements are also reduced. The production costs (both material and activities) are posted to the PCC. The Logistics Information System (LIS) statistics are updated as well.

[»] Note

The **Backflushing** indicators in the material master, work center, and routing aren't relevant for REM. If the REM profile supports backflush, then all the components of the assembly or finished product are backflushed (excluding bulk materials).

- **Carrying out an assembly backflush**

As shown in [Figure 6.11](#), you enter the **Material**, **Plant**, and **Production Version**, and the system picks the **Planning Plant**, **Receiving SLoc** (receiving storage location), and **Production Line**. The confirmation quantity (**Conf. Qty**) entry is mandatory, as is the selection of **Assembly backflush**. Click the Post button to save, and the system will post the assembly backflush by posting GR, the BOM will be exploded in the background, and the GI for components and activities will be posted. If you want to post any corrections for the components or want to adjust the activities, click on the **Post with Correction** button, and adjust (add, remove, change quantity, etc.) the components or activities as needed.

The assembly backflush is posted, and the system generates a message, as shown in [Figure 6.12](#).



Figure 6.12 REM: Assembly Confirmation Posting

From the **REM Confirmation** screen, you can select the **Details** button to see and change different business transactions (see [Figure 6.13](#)).

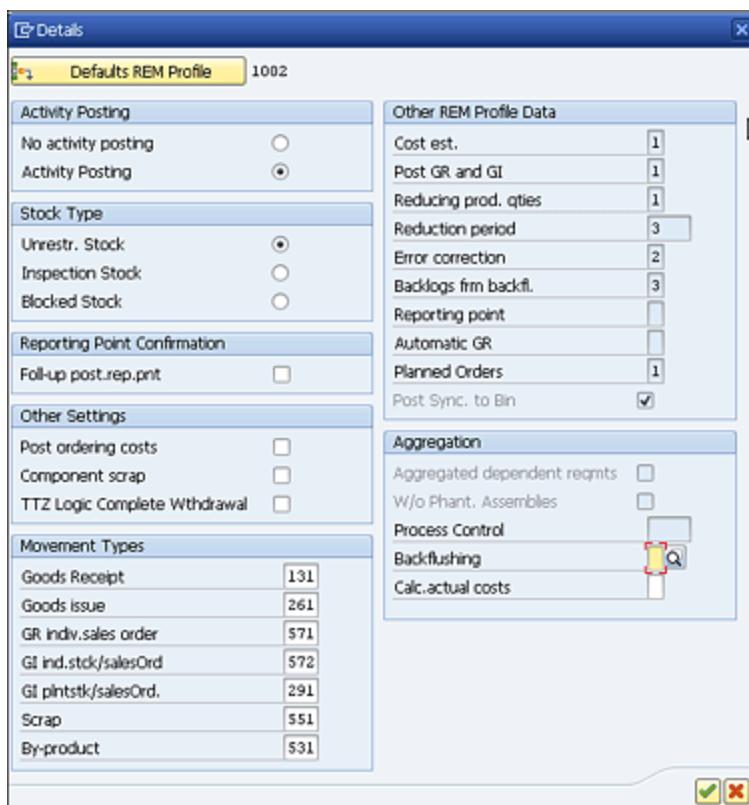


Figure 6.13 REM Confirmation: Details

- **Mandatory reporting point backflush**

If the manufacturing process involves many process steps and long lead times to complete the production process, then it makes sense to use reporting point backflush, where the GI posting of the components can be close to real time. When the physical

consumption of components to production occurs, it's better to post the consumption in the SAP system at the production operation, which can be defined as a reporting point.

Reporting points are defined in the routing. It's mandatory to have more than one operation in the routing/rate routing. For the reporting point operation, you must select a control key with the setting as **Milestone Confirmation**. The reporting point operation must be confirmed. The system backflushes all the components assigned to this operation and all the preceding operations up to the previous reporting point operation. The components must be assigned to the individual routing operations.

For reporting point confirmation, it's mandatory to select the **RP Confirmation** indicator in the REM Confirmation screen and select the appropriate **Reporting Point**, as shown in [Figure 6.14](#).

Figure 6.14 Reporting Point Backflush

Assembly scrap can be posted with the mandatory reporting point. The system posts the GI of components at the reporting point as well

as the activities. Component scrap can be posted at the reporting point. For this, it's required to select the **Component backflush** radio button on the **REM Confirmation** screen. For component scrap posting, the GI of components is posted but not the activities.

6.2.6 Cost Object Controlling

In REM, costs are always collected and analyzed in the PCC, which acts as the cost object. The PCC will receive all the costs posted on the order that will be settled periodically, so product cost by period is applicable for REM. In some cases, order-based production (production order scenario/discrete manufacturing) can also have PCC as the cost object and will undergo period-based settlement.

A production version is a mandatory object for production processes in SAP S/4HANA, which is true for both REM and discrete manufacturing. A PCC should be created for each production version. During the creation of the PCC, you can create the preliminary costing for PCCs, or, with Transaction MF30 (Preliminary Costing for Product Cost Collectors), mass creation of preliminary costing for many materials together. During the confirmation process, the components are consumed, and the production activities are posted to PCCs. The assembly cost is credited, and components and activity costs are debited to the PCCs.

In the period-end closing, the following steps are executed:

- Template allocation**

This assigns the overhead costs.

- Revaluation of activity prices**

Cost center activity prices are recalculated.

- **Overhead costing**

This applies overheads to the cost object (PCC).

- **WIP calculation**

The unfinished products are valued during WIP calculation.

Legal requirements also may mandate this step.

- **Variance calculation**

During the production process, components can be consumed in excess, or generation of scrap may lead to variances.

- **Settlement**

During settlement, the WIP and variances are posted to financial accounting.

[!] Warning

Make sure that the PCC isn't locked, isn't closed, or doesn't have the **Deletion** flag set. With these statuses, the PCC won't be part of period-end closing activities.

[»] Additional Reporting Functions

Various reports and information systems are available in REM.

Some of the important reports are listed here:

- Report MF26 (Reporting Point Overview) provides a statistical overview of all the reporting points in a production version.
- Report MF12 (Display Data Entry Documents) provides access to the actual data entered in the system.

- With the **LIS Statistics** menu, various reporting options are available, such as reporting point statistics, GR statistics, consumption, and cost statistics.

6.3 Configuring Repetitive Manufacturing

Setting up customization for REM is relatively straightforward. The most important customization setting is the REM profile. The consultant or the business partner who handles the product process should be aware and have a good understanding of the various settings and options available.

There are two options to customize the REM profile:

- **Create Repetitive Manufacturing Profile Using Assistant**
This option can be customized with the menu path **SAP IMG • Production • Repetitive Manufacturing • Control • Create Repetitive Manufacturing Profile Using Assistant** or with Transaction OSPT. The assistant will take you through the questionnaire step by step, and the questions are flexible based on the answers provided.
- **Define Repetitive Manufacturing Profiles**
This option can be customized with the menu path **SAP IMG • Production • Repetitive Manufacturing • Control • Define Repetitive Manufacturing Profiles** or with Transaction OSP2. This option doesn't have the assistant.

The REM profile controls various business functions. Following are examples of what the REM profile controls:

- For separated backflush, the REM profile controls whether GI posting for the components is separated with GR of assemblies or GI and GR together.
- For backflush of production activities and GR, the REM profile controls whether you only want it to post a GR.

- When the backflushing processes are separated at the final backflush, the REM profile controls whether the system should post the GIs for the components and/or production activities in a separate transaction, or whether the system should do this automatically as a background job at a later point in time (**Process Control** field).
- SAP standard goods movements are suggested, but the REM profile controls changing the goods movements based on requirements.
- The REM profile controls whether reporting points will be used (**Reporting Point Backflush** fields). Reporting points are like the milestone logic of discrete manufacturing.

The REM profile can be created by using the REM assistant. Based on the requirement, it's possible to create an REM profile:for make-to-stock (MTS) or make-to-order (MTO) production, as shown in [Figure 6.15](#). This order type controls the PCC functions. While using the REM profile assistant, the system guides you step by step to configure the REM profile to suit the exact business requirements. The **Recommendations** and **Meaning** buttons give you additional information and guidance on the settings you can make in each screen and the effects these settings may have. It's also possible to input an existing REM profile as a template. At the end, by giving an

appropriate name and description, the REM profile will be created by saving the entries.



Figure 6.15 Repetitive Manufacturing Profile Creation with Assistant

[»] Note

When creating REM profiles, the question catalog is flexible depending on the answers. Based on the options selected, the subsequent answers will be appropriately predefined. In the following sections, all the possible selection options were explored to provide clarity.

[»] Note

The order type for MTO REM is SA, and the order type for MTS REM is PKMN.

The following steps provide an overview of how REM profile creation with assistant works:

1. Reporting points

Reporting points are the operations performed during the production of assemblies or subassemblies. They are like milestones in discrete manufacturing and serve the same purpose. Reporting points are used to aid the withdrawal of components or calculate WIP. As shown in [Figure 6.16](#), it's possible to select **No reporting points**, **Mandatory reporting points**, or **Optional reporting points**.

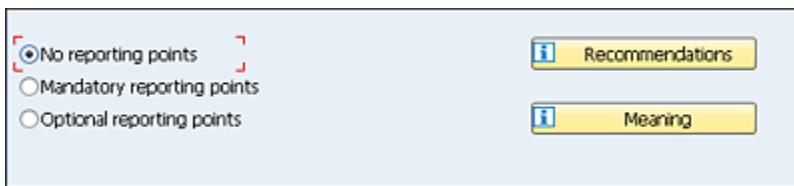


Figure 6.16 REM Profile: Reporting Points Processing

The very purpose of REM is simplicity, so to cater to this, optional reporting points can be used for maximum flexibility. With optional reporting points, the production posting will be performed at the end of the production. Along with GR posting for the assembly, the GI of the components will also be posted simultaneously. WIP calculation or additional scrap quantity postings can be posted at the reporting points.

With mandatory reporting points, it's required to post the backflush at every reporting point. For long lead time products, it may be necessary to post actual consumption of components close to actual production situation and actual consumption.

2. Posting activities and cost calculation

As shown in [Figure 6.17](#), you must define whether to post the

activities to a PCC during the assembly backflush.

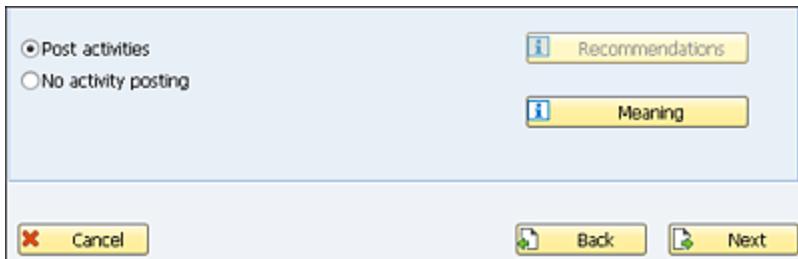


Figure 6.17 REM Profile: Posting Activities

The system calculates the production activities using a standard cost estimate for the assembly or the preliminary cost estimate for the PCC. This selection is based on the option selected for costing, as shown in [Figure 6.18](#). If a material is manufactured with only one production version, or there isn't much difference between production versions (i.e., manufacturing process or BOM), then it will be better to select **Use data from standard cost estimate**. If you manufacture a material on different production lines where there is a considerable difference in costing, then select **Use data from preliminary costing**.



Figure 6.18 REM Profile: Costing

3. Automatic GR

Automatic GR is only applicable for reporting points (refer to [Figure 6.16](#)). In the reporting point process, you can instruct the system to automatically post the GR for the assembly at the last reporting, as shown in the [Figure 6.19](#). If you use

Mandatory reporting points, then it's recommended to use **Automatic GR**.



Figure 6.19 REM Profile: Automatic GR

If you opt to use **Optional reporting points**, then the usual proactive is to select **No automatic GR** option, as the components are usually backflushed along with GR.

4. Reporting point confirmation with kanban

Reporting point confirmation with kanban can be used for in-house-produced materials with REM with reporting points, which is one of the replenishment strategies in kanban processing. As shown in [Figure 6.20](#), the default option **RP Confirmation w/o Kanban**. This option is selected in the usual REM process.

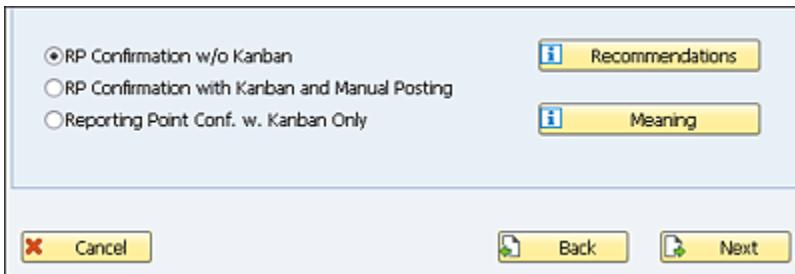


Figure 6.20 REM Profile: Reporting Point Confirmation with Kanban

For the usage toward kanban replenishment, there are two other options available:

- **RP Confirmation with Kanban and Manual Posting**

- Reporting Point Conf. w. Kanban Only

We'll discuss this replenishment strategy for kanban in the next section.

5. Separated backflush

You have the option of combining the GI and activities from GR. GR is posted separately, and the GI and activities are posted later, as shown in [Figure 6.21](#). The GI and activities are also aggregated and posted separately. This option is important if you want to improve system performance for large BOMs where GI of all the components and posting of activities can consume the system resources. The **Separated backflush** or **No separated backflush** option selections are shown in [Figure 6.21](#)



Figure 6.21 REM Profile: Separated Backflush

If the selection is **No separated backflush**, then the options shown in [Figure 6.22](#) will appear. During assembly confirmation, you choose whether to post GR and GI together (**Post GR and GI**) or GR only (**Post GR only**). If you're not

using the **Separated backflush** function and **Post GR only**, then you manually separate the GR and GI postings.



Figure 6.22 REM Profile: Automatic GR and GI

6. Process control

If you choose **Separated backflush** (refer to [Figure 6.21](#)), then the following screen appears. The backflushing process consists of several critical processes and noncritical processes. Critical processes include posting GR and reducing capacity requirements. Noncritical processes are GI of components, calculation of costs, and so on. With the **Process Control** function, as shown in the [Figure 6.23](#), it's possible to customize and handle the GI and cost calculation separately, which can be carried out, for example, as a background job sometime later. You can choose when the GI and cost calculation are performed and how they are handled. Based on business needs, the **Process Control** function can be customized with Transaction OPKD.



Figure 6.23 REM Profile: Process Control

7. Firming planned orders in the planning table

With the planning table, it's possible to create planned orders. As shown in [Figure 6.24](#), there are firming options to handle the planned orders that are created with the REM planning table. You should select **Always firm planned orders**, or the system may change the planned orders during the next MRP run.



Figure 6.24 REM Profile: Firming Logic of Planned Orders

8. Stock determination

If the components are stored in several storage locations, then it's possible to specify in the stock determination from which storage locations and in which sequence the components are to be consumed. This applies both to a business's own stock and for consignment stock. Stock determination enables the system to suggest available stock for consumption based on the defined criteria. Based on the business requirement, if you want to use stock determination, then the stock determination can be customized with Transaction OSPX.

The combination of plant, stock determination rule, and stock determination group define the stock determination. The stock determination rule is maintained in the REM profile, and the stock determination group is maintained in the material master.

9. Batch determination

Specific to REM, if you want to have a separate batch determination, then the settings in the REM profile must be managed; otherwise, the system uses the preset general batch

search procedure. Batch determination is applicable for components managed in batches.

10. Reduction of planned order quantities

As shown in [Figure 6.25](#), it's possible to define whether the system reduces the planned order quantities, and, if so, which planned orders will be reduced and whether reduction is allowed or not.



Figure 6.25 REM Profile: Reduction of Planned Order Quantities

[+] Tip

With the **No reduction** option, the planned order quantity won't be reduced unless the backflush happens with reference to a planned order.

11. Reduction period

As shown in [Figure 6.26](#), the **Reduction period** field is maintained as the number of days in which the system reduces the planned orders in the future. This period is calculated by adding the number of days maintained to the backflush date. This selection works in conjunction with the **Reduction of Planned Order Quantities** option, as shown earlier in [Figure 6.25](#). Whether and how to reduce the planned order is determined with this setting. Outside the reduction period, the planned orders won't be reduced. Reduction of old planned

orders will be the priority for the system; after that, the system will consider future dates.

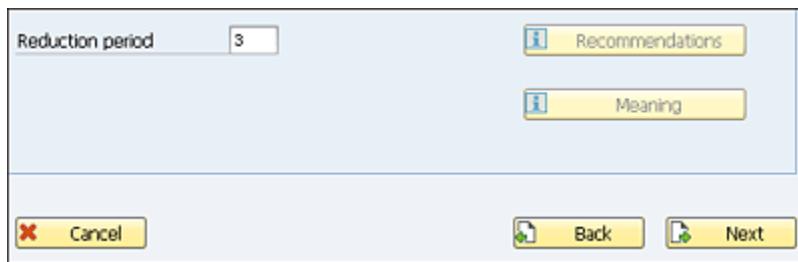


Figure 6.26 REM Profile: Reduction Period

[»] Note

If the planned orders are created because of PIRs, these PIRs are reduced when the GI of stock is posted from the storage location.

12. Recreation of planned orders with backflush reversal

It may happen that the backflush quantities need to be reversed. In that case, as shown in [Figure 6.27](#), re-creation of planned orders with or without the reversed quantity can be selected (**Create plnd orders for reversed GR qty** and **Create planned orders with asynch. MRP**, respectively).

In general, it's not required to re-create the planned orders automatically with reference to reversal of GR or backflush

quantity, as the MRP will create planned orders in the next MRP run.



Figure 6.27 REM Profile: Re-Creation of Planned Orders at Backflush Reversal

13. Error correction when backflushing

When backflushing, errors may occur due to various reasons such as insufficient component quantities, cost calculation errors, and so on. If you select **Online correction mandatory**, the system allows you to post the backflush after the correction of errors. As shown in [Figure 6.28](#), the other available options are **Optional online correction** and **No online correction**. It's possible to correct the backflushing errors with a separate transaction code. The settings in this section are dependent on the next topic, as shown in [Figure 6.29](#).

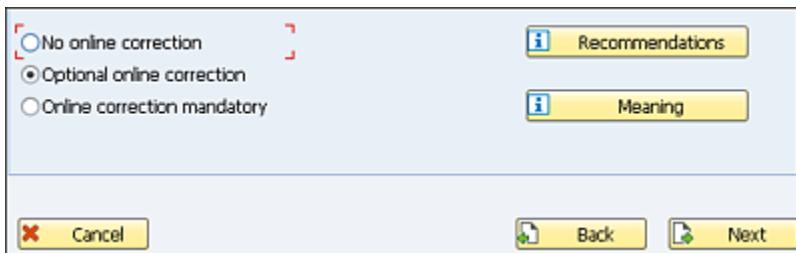


Figure 6.28 REM Profile: Error Correction When Backflushing

14. Reprocessing records

The processing of reprocessing logs is required in conjunction with the error correction in backflushing. As shown in [Figure 6.29](#), it makes sense to select **No processing records** if, as shown previously in [Figure 6.28](#), the selection is **Online**

correction mandatory. As with the **No processing records** selection, the error records won't be logged, and the information will be lost.

The advantage of the **Cumulated reprocessing records** (also called cumulated backlogs) is that the backlog documents are saved in a collective document, which will be good for system performance. But there are a few disadvantages as well. For example, when reversing, the postprocessing documents aren't updated. For individual and cumulative reprocessing records, the system posts both cumulative and individual records per missing document. This process is performance intensive but avoids duplicate postings.



Figure 6.29 REM Profile: Reprocessing Records

15. Movement types in REM

As shown in [Figure 6.30](#), the standard SAP S/4HANA 2020 release out-of-the-box goods movements for REM processing is available. Based on the business requirement, if the business's own goods movements are to be used for REM processing, then they must be created already in the inventory management customization. If you're creating the REM profile

for an MTO scenario, then SAP standard goods movements specific to sales orders will be available.

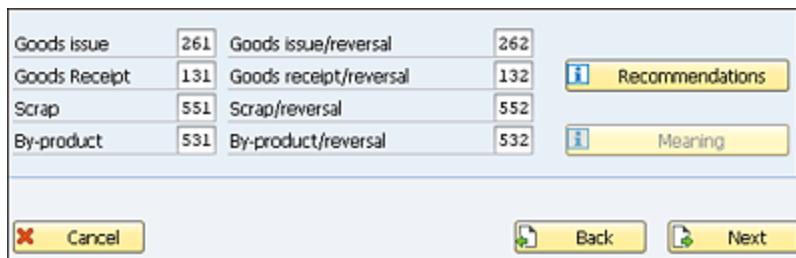


Figure 6.30 REM Profile: Movement Types for MTS Scenario

After this step, provide a suitable REM profile code and REM profile name to complete the REM profile creation with assistant. Now this REM profile is ready to use in the production process.

16. Synchronous backflush posting with SAP Extended Warehouse Management backflush posting with SAP Extended Warehouse Management integration

Synchronous backflush posting in REM is the new feature included in the SAP S/4HANA 1909 release. The GI of components and GR from and to SAP Extended Warehouse Management in SAP S/4HANA managed storage locations has been simplified with this release. The inventory management and SAP Extended Warehouse Management postings will happen synchronously. This simplifies the overall REM processes and reduces the manual transaction postings efforts to a minimum.

The **Post Synchronously to Bin** control to integrate the synchronous goods movements is available in the REM profile, as shown in [Figure 6.31](#).

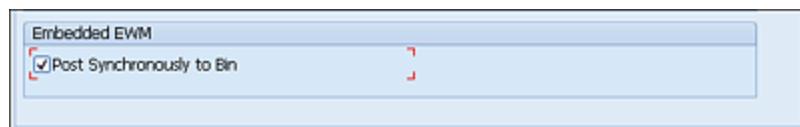


Figure 6.31 REM Profile: Synchronous Backflush Posting

6.4 Kanban

Kanban is synonymous with lean manufacturing. In this system, the material flow is controlled on a need basis in production or procurement, which eliminates the buildup of excess inventory and waste. In the next subsections, we'll provide an overview of kanban, and discuss the master data needed for kanban, replenishment strategies, kanban control, and error processing.

6.4.1 Overview

Kanban was developed and extensively used at Toyota and is one of the main components of the Toyota Production System (TPS). TPS is an inspiration to many production systems across the globe, especially, but not limited to, the automotive industry. Now many organizations are implementing agile methodologies for ways of working, software development and so on, in which usage of the kanban principle and kanban boards is an integral part.

Kanban works on the pull principle, which means the materials are pulled when needed by the consumer (manufacturing operation, customer, etc.) of the materials from the supply source (preceding operation, supplier, etc.). To connect the demand source and supply source, a control cycle is maintained between them. The control cycle carries the information, such as quantity, number of kanbans, apart from demand source, and supply source. A physical signal (kanban card) or electronic signal is sent from the demand source to the supply source, and then the replenishment is triggered, as shown in [Figure 6.32](#). These cards are known as *kanbans* in the Japanese language, as is the name of this type of production. Master data plays a vital role in the success of kanban replenishment, which we'll

discuss in the next sections. There are similarities between kanban procedures and reorder point planning.

Various kanban procedures are available and can be used based on the requirement:

- **Classic kanban**

This kanban method is widely used in the industry. In this method, strict adherence to the information in the control cycle is achieved. Replenishment of kanban quantities always adheres to the quantity and number of kanban containers maintained in the control cycle. We'll go into details about classic kanban later in this chapter.

- **Event-driven kanban**

This kanban method is used if you want to replenish the materials based on actual consumption, which means the kanban container creation is based on a certain event. This kanban procedure isn't based on quantity or number of kanban containers mentioned in the control cycle.

The SAP S/4HANA system also supports other kinds of kanban procedures, which can be considered and explored based on the business requirements.

Kanban replenishment is shown in [Figure 6.32](#)

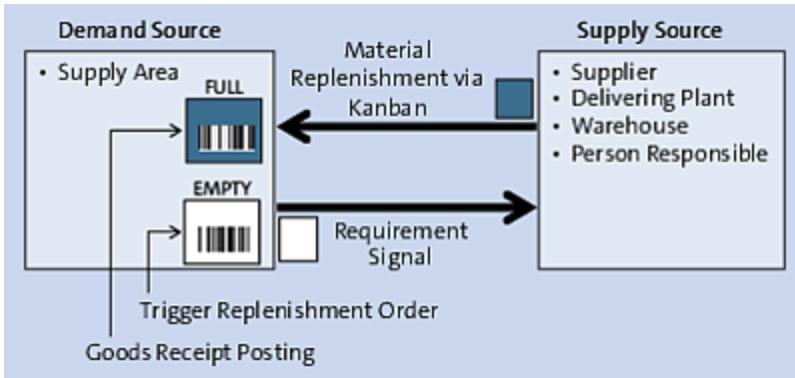


Figure 6.32 Kanban Replenishment

6.4.2 Master Data

The master data is important in any production process, and in the case of kanban, production supply areas (PSAs) and control cycles are created as master data:

- **Production supply area (PSA)**

Also known as *supply areas*, the PSA is a specific area to place component materials, for example, marked out places, special boxes, and so on, adjacent to the production work centers. This is the place where the materials are staged directly for production purposes and is the area from which the materials are supplied for production purposes. Many work centers may share the same PSA.

A PSA can be created with the SAP GUI menu path **Logistics • Production • KANBAN • Production Supply Areas • Maintain** or with Transaction PK05. PSAs can also be created with fast entry Transaction PK05S.

Two SAP Fiori apps are also available for creating PSAs, as shown in [Figure 6.33](#).



Figure 6.33 SAP Fiori Apps to Create Production Supply Areas

As shown in [Figure 6.34](#), the PSA is plant specific and will be assigned to a storage location. A PSA is a production planning object and not an inventory management object. Goods movements happen at the storage location level for which the PSA is assigned.

A screenshot of an SAP Fiori view titled 'Display View "Production Supply Area": Details'. The view includes a navigation bar with 'Previous Entry', 'Next Entry', 'Other Entry...', 'Address', and 'More'. The main area contains several input fields: 'Plant' (1710) and 'Plant 1 US'; 'Supply Area' (TS422_PSA1) and 'TS422-PSA1 for Kanban'; 'Storage location' (171E) and 'KANBAN'; 'Responsible' (KAL) and 'TS422_PSA Respble'; '(Auto) Unloading Point' (empty); 'Unloading Point' (Assembly Area - Ramp 1); 'Loading Point' (empty); 'Factory Calendar (Consumer)' (empty); 'Shift Grouping (Consumer)' (empty); 'Shift Sequence (Consumer)' (empty); 'Pull Interval [Days]' (0); and 'Pull Interval [#min:]' (empty).

| | | |
|------------------------------|------------------------|-----------------------|
| Plant: | 1710 | Plant 1 US |
| Supply Area: | TS422_PSA1 | TS422-PSA1 for Kanban |
| Storage location: | 171E | KANBAN |
| Responsible: | KAL | TS422_PSA Respble |
| (Auto) Unloading Point: | | |
| Unloading Point: | Assembly Area - Ramp 1 | |
| Loading Point: | | |
| Factory Calendar (Consumer): | | |
| Shift Grouping (Consumer): | | |
| Shift Sequence (Consumer): | | |
| Pull Interval [Days]: | 0 | |
| Pull Interval [#min:] | | |

Figure 6.34 Production Supply Area

The person responsible can be created as an MRP controller who monitors the stock/inventory in the supply area and is the responsible person for the source of demand.

For external procurement, the unloading point is the place where the suppliers deliver the materials. The kanbans are transferred from the unloading point to the PSA.

- **Control cycle**

The control cycle defines the relationship between the demand source and the supply source. As shown in [Figure 6.35](#), the Manage Kanban Control Cycle app in SAP Fiori can be used to create control cycles.



Figure 6.35 Manage Kanban Control Cycles App

The demand source is always the PSA in a control cycle. The supply source is based on the replenishment strategy, which we'll employ for, for example, in-house production, external procurement, or stock transfer. The supply source can be a vendor, delivering plant, or responsible person in the case of in-house production.

Important kanban-specific information is maintained in the **Kanban Containers** area of the screen (see [Figure 6.36](#)) is **Container Quantity and Number of Containers**. Based on the **Replenishment Strategy** (look ahead to [Figure 6.37](#)), more selection options will change. In the example shown in [Figure 6.36](#),

we'll proceed with creating a control cycle with the **Stock Transfer** replenishment strategy.

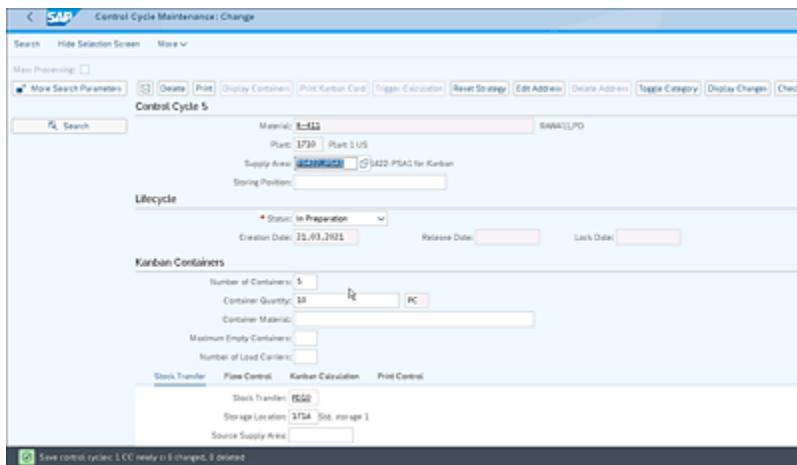


Figure 6.36 Creation of the Kanban Control Cycle

When you set **Stock Transfer** in the **Replenishment Strategy** tab, as shown in [Figure 6.37](#), then the next screen opens where you have to assign the storage location from where the stock transfer replenishment is posted (see [Figure 6.38](#)).

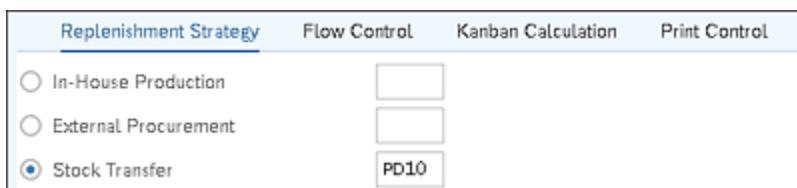


Figure 6.37 Control Cycle: Stock Transfer Replenishment Strategy

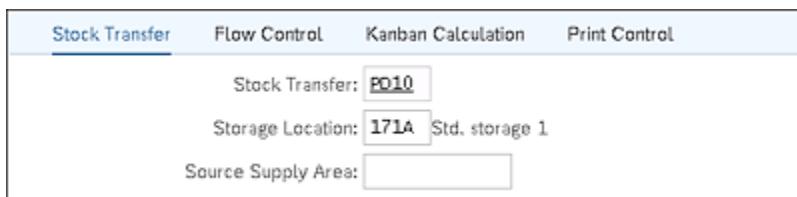


Figure 6.38 Stock Transfer Replenishment Strategy: Storage Location Assignment

The goods receiving storage location has already been defined while defining the PSA.

[!] Warning

Make sure to set the control cycle **Status** to **Released** before processing the kanban.

6.4.3 Replenishment Strategies

As noted in the control cycle creation discussion, the replenishment strategy is one of the most important topics and business strategies for how to replenish the needed components while implementing kanban. SAP S/4HANA standard out-of-the-box replenishment strategies are available, and, if needed, you can customize additional replenishment strategies based on business requirements.

Replenishment strategies can be broadly divided into the following three categories:

- **In-house production**

Several replenishment strategies are available for in-house production, which means you want to produce the materials yourself. Replenishment is done using planned orders (run schedule quantities), with REM using reporting points, with production orders, and manual kanban. The different control options available are shown in [Figure 6.39](#). In these strategies,

simply setting the container status to **Empty** or **Full** will control the material flow.

- | |
|---|
| 1 Working with kanbans and cost collector |
| 2 Processing with Planned Orders and Cost Collector |
| 3 Working with production orders |
| 4 Replenishment using containers / MRP |
| 5 Working with planned orders / MRP |
| 6 Working with production orders / MRP |
| 7 Processing with Cards and Reporting Points |
| 8 Processing w. Cards and Reporting Points/Preplanning w. MRP |

Figure 6.39 Control Types for In-House Production

- **External procurement**

Replenishment strategies for external procurement are available with purchase orders, scheduling agreements, stock transport orders (plant to plant), source lists, and summarized just-in-time calls. The different control type options for external procurement are shown in [Figure 6.40](#).

- | |
|--|
| 1 Working with purchase orders |
| 2 Working with scheduling agreements |
| 3 Working with stock transport order |
| 4 Working with stock transport scheduling agreements |
| 5 Working via source list |
| 6 Replenishment using containers / MRP |
| 7 Working with summarized JIT calls |

Figure 6.40 Control Types for External Procurement

- **Stock transfer**

There are several replenishment strategies available for stock transfer. Replenishment using reservations and replenishment with SAP Extended Warehouse Management storage locations

are available for this purpose. The different options available in stock transfer are shown in [Figure 6.41](#).

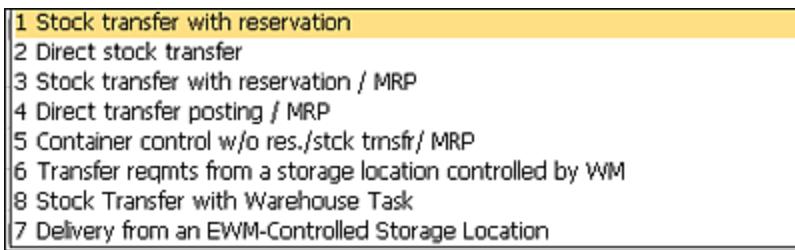


Figure 6.41 Control Types for Stock Transfer

6.4.4 Kanban Control

In this section, you'll see the simple kanban replenishment with stock transfer strategy. The kanban board can be accessed with the Demand Source Overview app (see [Figure 6.42](#)) or the Supply View app, both from SAP Fiori.

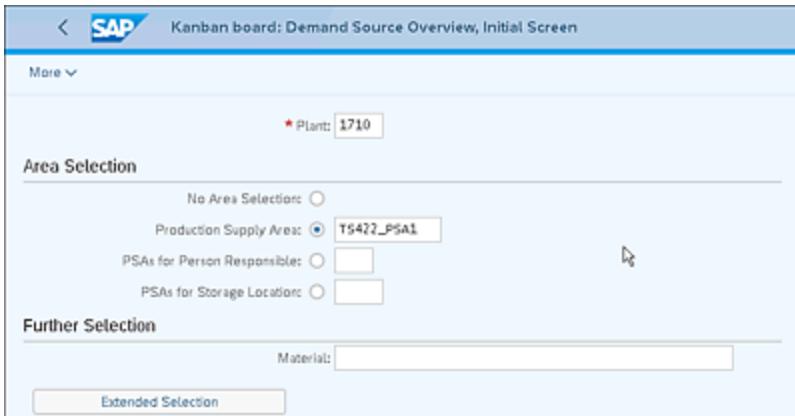


Figure 6.42 Kanban Board: Demand Source Overview

[»] Note

The kanban board can be accessed with the following SAP GUI transactions:

- Transaction PK13N: Demand-Source View

- Transaction PK12N: Supply-Source View

When the control cycle is created, the kanban has the status **WAIT**, as shown in [Figure 6.43](#). To trigger the replenishment, kanban 11 was processed by setting the status to **EMPTY**. Initially, there was an error with error message, **Deficit of SL Unrestricted Use 10PC**. As the initial status of the kanban 11 is **Error**, the first thing is to correct the error. We'll cover error correction in [Section 6.4.5](#), so proceed to that section for that information and a successful process.

Setting the appropriate kanban status is the prime important task for successful replenishment. When the kanban status is set to **FULL**, the GR posting occurs. By setting the kanban status to **EMPTY**, the replenishment is triggered based on the replenishment strategy maintained in the control cycle. GI won't be posted by setting the container to **EMPTY**. Component GIs are backflushed when the confirmation happens or manually posted for an order.

| CtrlCycle | Material | Supply Area | Production Supply Area Name | Ctrl Obj | Unit | Tracking Unit | Kanban ID | Item | Status | Status | Change Date | Standard | Sep. GR |
|-----------|----------|-------------|-----------------------------|----------|------|---------------|-----------|------|--------|--------|-------------|----------|---------|
| 5 | R-411 | TS422_PSA1 | TS422_PSA1 for Kanban | 10 | PC | | 12 | 2 | 1 | WAIT | | | |
| | | | TS422_PSA1 for Kanban | 10 | PC | | 13 | 3 | 1 | WAIT | | | |
| | | | TS422_PSA1 for Kanban | 10 | PC | | 14 | 4 | 1 | WAIT | | | |
| | | | TS422_PSA1 for Kanban | 10 | PC | | 15 | 5 | 1 | WAIT | | | |
| | | | TS422_PSA1 for Kanban | 10 | PC | | 16 | 1 | 9 | ERROR | 21.03.2021 | | |

Figure 6.43 Kanban Board: Managing Stock Transfer Replenishment

6.4.5 Error Processing

From the kanban board, select **Menu • Go to • Kanban Correction** to get more information about the error. To correct kanban errors, use Transaction PK31. Here, you'll find the errors based on the material per PSA. By placing the cursor on the kanban error line and selecting the **Display Detailed Data for Kanban**, the bottom half of the screen will open to show the many options available for error

processing (see [Figure 6.44](#)). In this error case, the stock was placed in the source storage location, so simply reprocessing the kanban error was sufficient to change the status from **EMPTY** to **FULL**. After successfully processing the error, in the kanban board, the kanban 11 status is received as **FULL** (see [Figure 6.45](#)), and the stock transfer happens successfully.

[»] Note

It's possible to delete Kanban errors, but simply deleting an error

won't rectify its cause.

Kanban Correction for Control Cycle 5

Material: R-411
Plant: 1710
Supply Area: TS422_PSA1
Stock Transfer: FD10
Kanban Quantity: 10 PC

Kanbans

| Kanban ID | K... | Bl... | Actual Quantity | Status | Change D... | Change... | Replenishmt element |
|-----------|------|--------------------------|-----------------|--------|-------------|-----------|---------------------|
| 11 | 1 | <input type="checkbox"/> | 0 | ERROR | 21.03.2021 | 22:32:03 | MtRes 0000004222 OC |
| 12 | 2 | <input type="checkbox"/> | 0 | WAIT | | 00:00:00 | |
| 13 | 3 | <input type="checkbox"/> | 0 | WAIT | | 00:00:00 | |
| 14 | 4 | <input type="checkbox"/> | 0 | WAIT | | 00:00:00 | |
| 15 | 5 | <input type="checkbox"/> | 0 | WAIT | | 00:00:00 | |

Correction

Correction from: EMPTY ----> FULL

Kanban Item: 1
Kanban Status: 9 ERROR Container Incorrect
Actual Quantity: PC

Kanban Corr.

- Status/Quantity
- Replenishment
- Quantity/Batch
- Reverse
- Cancel

Figure 6.44 Kanban Error Processing

Kanban Board: Demand Source View From 03:24 Time

More ▾

| CntCycle | Material | Supply Area | Production Supply Area Name | Enter Qty | Unit | Tracking Unit | Kanban ID | Item | Status | Status | Change Date | Blocked | Sep. GR |
|----------|----------|-------------|-----------------------------|-----------|------|---------------|-----------|------|--------|------------|-------------|---------|---------|
| 5 | R-411 | TS422_PSA1 | TS422-PSA1 for Kanban | 10 | PC | | 12 | 1 | WAIT | | | | |
| | | | TS422-PSA1 for Kanban | 10 | PC | | 13 | 2 | WAIT | | | | |
| | | | TS422-PSA1 for Kanban | 10 | PC | | 14 | 3 | WAIT | | | | |
| | | | TS422-PSA1 for Kanban | 10 | PC | | 15 | 4 | WAIT | | | | |
| | | | TS422-PSA1 for Kanban | 10 | PC | | 16 | 5 | WAIT | | | | |
| | | | TS422-PSA1 for Kanban | 10 | PC | | 11 | 15 | FULL | 22.03.2021 | | | Green |

Figure 6.45 Kanban Status Change to FULL

6.5 Important Terminology

In this chapter, the following terminology was used:

- **Backflush**

This is a REM process where automatic GI of components is posted. In REM, “backflushing” is synonymous with “conformation.”

- **Control cycle**

The control cycle defines the relationship between the demand source and the supply source.

- **Goods movement**

Inventory is moved inside and outside the organization, including GRs, stock transfers, and GIs.

- **Movement type**

Movement type is a three-digit key that denotes and controls specific goods movements.

- **Planning table**

This tool manages the operative planning and is used to plan production quantities.

- **Preliminary costing**

Preliminary cost calculation is performed when creating cost estimates for PCCs in the context of REM.

- **Product cost collector (PCC)**

In REM, the PCC is the cost object that collects all the target and actual costs.

- **Production version**

The production version is the combination of BOMs and routings

(or rate routings) used to produce a material in manufacturing.

- **Rate routing**

The production process of REM is represented as a rate routing.

- **Repetitive manufacturing (REM) profile**

The REM profile is defined in customization and controls how you plan and confirm REM.

- **Reporting point**

In REM, reporting point is an operation in the routing/rate routing with the control key with milestone confirmation (similar to milestone confirmation in discrete manufacturing). Reporting points are used in reporting point backflush.

- **Run schedule quantities**

REM is executed with run schedule quantities, and they are created as planned orders. The system creates this type of planned order if you've set the **REM** indicator in the material master record and created a production version for the material.

- **Stock determination**

This is the criteria that determines the type of stock and storage location from which the GI is posted.

- **Storage location**

This is an organizational unit where the stock/inventory quantities are managed in inventory management.

6.6 Practice Questions

These questions will help you evaluate your understanding of the topics covered in this chapter. They are similar in nature to those on the certification examination. Although none of these questions will be found in the exam itself, they will allow you to review your knowledge of the subject. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers and only correct answers to receive credit for the question.

1. With reference to REM, which of the following statements are correct? (There are two correct answers.)
 - A.** The same product is produced over a longer period of time.
 - B.** The **REM allowed** indicator is mandatorily set to enable REM.
 - C.** The planned order is the cost object in REM.
 - D.** The BOM should have only one component so that backflushing will be easy.
2. Which of the following production planning and manufacturing master data objects are relevant for REM? (There are two correct answers.)
 - A.** BOM
 - B.** Source list work center as production line
 - C.** Product cost collector (PCC)
 - D.** Work center as production line
3. True or False: For final assembly backflush, more than one operation will be maintained in the routing.

- A.** True
 - B.** False
4. True or False: In REM backflushing, the receiving storage location of the assembly is always picked from the material master production **Storage Location** field and will have the highest priority.
- A.** True
 - B.** False
5. The BOM is exploded during backflushing based on which of the following? (There are two correct answers.)
- A.** If a planned order is maintained, then the component list of the planned order is exploded.
 - B.** If a revision level and a planned order are maintained, then the revision level has the higher priority.
 - C.** The system will always explode the BOM based on the creation date of the BOM.
 - D.** The system explodes the current BOM (from the production version) based on the posting date.
6. True or False: Like the receiving storage location, the issue storage location maintained in the production version will have higher priority over the storage location information maintained in the material master.
- A.** True
 - B.** False
7. True or False: The stock determination group is assigned to the material master **MRP 2** view.
- A.** True
 - B.** False

8. In the REM profile,, the planned order reduction is maintained as **No reduction** and the **Reduction period** as **3 days**. Starting from which date will planned orders be reduced?
- A.** The reduction of planned orders will happen from today's date and three days into the future.
 - B.** All the planned orders are available within three days in the past.
 - C.** Oldest of the planned orders will be reduced first.
 - D.** Planned orders won't be reduced.
9. In the context of mandatory reporting point backflush, which of the following statements are correct? (There are three correct answers.)
- A.** The consumption posting of components is near to the actual production operation.
 - B.** At the end of confirmation of the last reporting point, planned order reduction and capacity reduction won't happen along with GR posting.
 - C.** More than one routing operation will be maintained for the reporting point backflush.
 - D.** It's not possible to display work in process (WIP) for the mandatory reporting point backflush.
 - E.** Assembly scrap posting at the reporting point will consume components only.
10. True or False: With material staging Transaction MF60, the consumption of components can be posted.
- A.** True
 - B.** False
11. Which of the following statements are correct for kanban? (There are three correct answers.)

- A.** The error processing in kanban is simplified. By deleting the kanban errors, the cause of the error will be rectified.
- B.** As soon as the container quantity is empty, replenishment elements are triggered.
- C.** When the container is full, GR is posted.
- D.** When the container is set to empty, GI is posted for the components.
- E.** Kanban is a self-managed process, and replenishments are triggered when a material is needed.

12. Which of the following are master data objects for kanban?
(There are two correct answers.)

- A.** Production supply area (PSA)
- B.** Control cycle
- C.** Product cost collector (PCC)
- D.** Storage location

13. Which of the following functions can be performed with a REM planning table? (There are three correct answers.)

- A.** Component backflush can be performed.
- B.** Planned order quantities can be dispatched.
- C.** Production orders can be created.
- D.** Final confirmations can be performed.
- E.** Planned orders can be created.

6.7 Practice Answers and Explanations

1. Correct answers: **A and B**

The main characteristic of REM is that the same product is produced over a longer period of time on the same production line.

The **REM allowed** indicator is mandatorily set to enable the material for REM. If this indicator is set, then the planned orders created for this material will carry the order type as PE, which is run schedule quantities.

In REM, product/material is the cost object, and the costs are collected by PCC.

2. Correct answers: **A and D**

BOM and work center (production line) are the mandatory master data objects related to REM in production planning and manufacturing. Source list is sourcing and procurement master data (materials management). PCC is management accounting (controlling) master data.

3. Correct answer: **B**

Final assembly backflush is the simplest form of backflushing, where the assembly is backflushed at the end of the production process. With this process, the system posts GR for the assembly, and it posts GI for the components and activities. So, a simple rate routing/routing with a single operation with the production line as the work center is maintained.

4. Correct answer: **B**

The receiving storage location can be maintained in the **Production Storage** field in the material master **MRP 2** view or in the **Receiving Location** field in the production version. The receiving storage location maintained in the production version will have higher priority than the material master production storage location, if the fields are maintained both the places.

5. Correct answers: **A and D**

The system will always explode the BOM at the posting date. If a planned order is maintained during backflushing, then the component list from the planned order is exploded. If both revision level and planned order are maintained, then the planned order will have a higher priority during the final backflush.

6. Correct answer: **B**

The issue storage location determination for components during backflushing is based on a set of rules:

- First priority: Storage location information maintained in the **BOM Item Status/Long Text** tab page of the item.
- Second priority: The MRP group maintained for the assembly, based on the customization entry (Transaction **OSPK_SLOC**). While defining this customization, you can influence whether the production version or production storage location from the material master will have higher priority.
- Third priority: Production storage location maintained in the material master of components is considered for consumption posting.

7. Correct answer: **A**

The customization activity of stock determination strategy is a combination of the stock determination rule and stock determination group. This determines which stock of components is withdrawn for the backflush. The stock determination group is assigned in the material master, and the stock determination rule is assigned to the REM profile.

8. Correct answer: **D**

In this case, the planned orders won't be reduced, and the REM profile setting for planned orders reduction is maintained as **No reduction**. In this case, the **Reduction period of 3 days** won't have impact on the planned order reduction.

9. Correct answers: **A, B, and C**

All the statements mentioned in answers A, B, and C are correct. The advantage of reporting point backflush (both mandatory reporting point backflush and optional reporting point backflush) is to capture and view WIP. In the case of assembly scrap posting at a reporting point, the components are consumed, and the activities are also posted (if the REM profile allows the activities posting).

10. Correct answer: **B**

With Transaction MF60 (Material Staging with Pull List), staging of components is performed from the source storage location to the issue storage location. It's only a stock transfer posting between storage locations with inventory movement type 311.

11. Correct answers: **B, C, and E**

Kanban errors are processed with Transaction PK31. The error reason and further details can be obtained from the kanban board. It's possible to delete the kanban errors, but the cause

of errors can't be corrected by simply deleting the errors. Setting the kanban status to **EMPTY** will trigger replenishment elements. GI will only be posted as part of the backflush.

12. Correct answers: **A and B**

PSA and control cycle are the master data objects related to kanban. PCC is controlling master data and can be used in conjunction with REM, and storage location is related to materials management master data, which can be used in the PSA and control cycle.

13. Correct answers: **B, C, and E**

Options A and D are related to production execution steps, where after production is completed in the shop floor, the GR of the finished product and backflushing of components with final confirmation can be posted. The remaining answers are correct, as with planning table, planned orders can be created, and the production quantities can be dispatched if you use the planning table in conjunction with capacity planning. If a planned order type LA is created, then this planned order can be converted to a production order within the planning table.

6.8 Test Takeaway

This chapter outlines an overview of REM and kanban processes that you can use to help customers adopt based on their business needs. You should be familiar with various features and options available in REM confirmation and be able to customize and set up the master data. You now can articulate and suggest the best fit options when establishing kanban and various replenishment strategies and control. You should be able to present precise instructions on how to correct errors during backflushing and kanban replenishment.

6.9 Summary

In this chapter, the aim was to understand the characteristics and overview of REM and kanban, which are both part of the lean manufacturing offering from SAP. We explored the concepts that can be adopted to simplify production execution and transaction overhead for users by adopting various backflushing methods. You now have an understanding of master data and the impact of field-level values on the overall process both in REM and kanban. We dealt with various cross-topics with cost object controlling and inventory management. In the next chapter, we'll explore the remaining important manufacturing methodology: production with process orders.

7 Process Orders

Techniques You'll Master

- Understand production planning for process industries
- Describe master data in process industries
- Explain how process orders work
- Review the process management steps

The objective of this chapter is to cover the various application areas, characteristics, master data, and their integration with respect to process order processing.

Several industries, such as chemicals, pharmaceuticals, fertilizers, beverages, food processing, petroleum, rubber, and several others, are characterized as process industries. This is mainly due to their complex manufacturing processes, extensive batch management, and use of active ingredients. The chapter begins with an overview of master data with a focus on the master recipe task list. We'll be covering material quantity calculation (MQC) and batch determination as they are integral parts of process industries. We'll discuss the key configurations and additional functionalities in reference to the process industries. We'll cover the process management component, which is mainly used to coordinate the exchange of production-relevant data between the enterprise resource planning (ERP) system and the external process control system (PCS). You'll learn about the importance of Good Manufacturing Practice (GMP) processes and functions, such as

digital signature, and how they help ensure the proper design, monitoring, and control of the manufacturing processes and facilities.

Real-World Scenario

As a production planning consultant, you'll be required to perform detailed analysis of complex business process requirements and provide appropriate system solutions; identify, interpret, validate, and document customer requirements. Depending on the manufacturing process, infrastructure, product complexity, stability, and further criteria, a manufacturing company has various requirements with regard to shop floor control.

Due to the various functionalities a process order offers, you may be required to set up process management in your SAP system to show the benefits of its many features and what the SAP standard has to offer to the customer. You should have thorough understanding of key concepts of production planning for process industries and functionalities of process management.

7.1 Objectives of This Portion of the Test

The objective of this portion of the certification exam is to test your knowledge of master data objects related to production planning. For the certification, you must have a good understanding of the following topics:

- Process order elements
- Process order processing
- Master data in process industries
- Process management

- Features of Good Manufacturing Process (GMP)

[»] Note

The process orders in SAP S/4HANA topic makes up less than 8% of the total exam.

7.2 Process Order Overview

Process orders are the main elements used for manufacturing in process industries. The process order forms the basis for planning and execution of process manufacturing for industries including chemical, pharma, and food and beverages. It's the manufacturing order used in process industries. You plan the quantities, dates, and resources of the manufacturing process required for order execution and define the rules for the account assignment and settlement of costs incurred. [Figure 7.1](#) represents the definition of a process order.

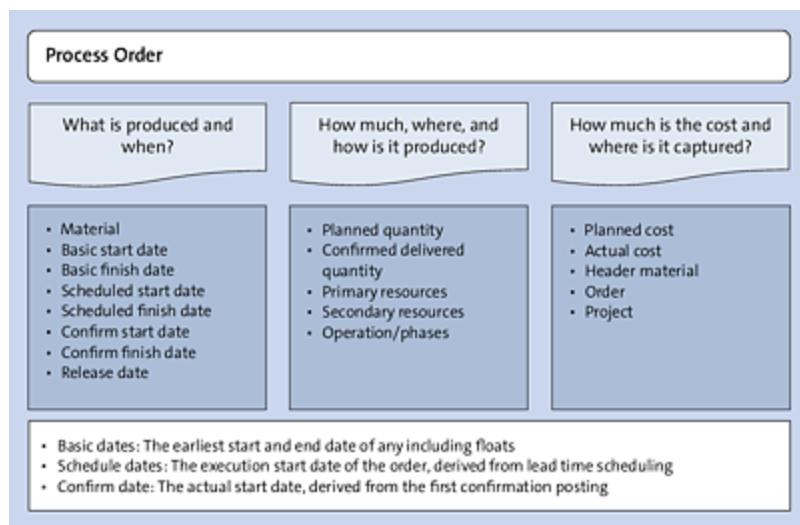


Figure 7.1 Process Orders Overview

A process order consists of operations that are further divided into phases, and each of these is carried out at a resource called the primary resource. A phase contains the detailed description of a part of the entire manufacturing process. Phases are assigned to their superior operation where a primary resource is available. Phases can be related to each other, and the sequence of the phase relationships can be sequential, parallel, or overlapping.

Single materials or multiple materials can be required and hence assigned for the execution of a specific process in an operation or phase.

A phase also contains standard values for activities in process industries like operations contain in discrete manufacturing. These values serve to calculate order dates, capacity requirements, and costs. Several secondary resources can be planned for operations and phases in addition to the primary resource. A phase can also hold a number of process instructions that transfer information relevant to the process control using messages.

A production process is triggered by existing or new requirements in the form of demands. During material requirements planning (MRP), the system performs the steps outlined in MRP and generates a planned order with basic date and production quantities. Later, these planned orders are converted into process orders. The basic dates and production quantities are copied from the planned order. The actual production dates are calculated using the basic dates.

After a process order has been released for production, the process instructions maintained in the control recipes during process management are added to the order. The control recipes are either transferred to a process control system (PCS) or as a process instruction sheet (PI sheet) that can be maintained by the line operator.

In return, process management receives process messages from the process control and transfers them to different destinations. For example, it's possible to record actual values of the process to functions for process data documentation and evaluation, post material consumptions or production yields as goods movements, and transfer quality data to a results data recording in quality management.

From a technical perspective, production orders, process orders, and plant maintenance orders are all identified using categories. The order category for process orders is 40. Process orders are very well integrated with various applications of logistics, as follows:

- Material planning for production: material master
- Usage of resources during the production process: resources
- Plan an operation/phase relevant for external processing: purchasing
- Plan in process or final quality inspections during production: quality planning data for process control and process management
- Determination of cost using the master recipe: controlling

7.3 Master Data for Process Orders

Process orders in process industries have their own unique set of master data when compared to other production types, such as discrete manufacturing or repetitive manufacturing (REM). The master data creation for process manufacturing begins with the material master of the product or the material to be produced (such as subassembly, assembly, and finished goods). Then you create a bill of materials (BOM) of the product that you want to produce and assign components, along with their quantities and several other parameters that are needed to produce the product. You then create the resource and master recipe for the material, which contains the detailed steps in sequence for how a product is manufactured, costed, and various other functions. Then you create the production version for the material and assign the material's BOM, that is, the master recipe.

The following sections cover the master data required for process orders, as shown in [Figure 7.2](#): material master, BOM, resource, production version, and master recipe.

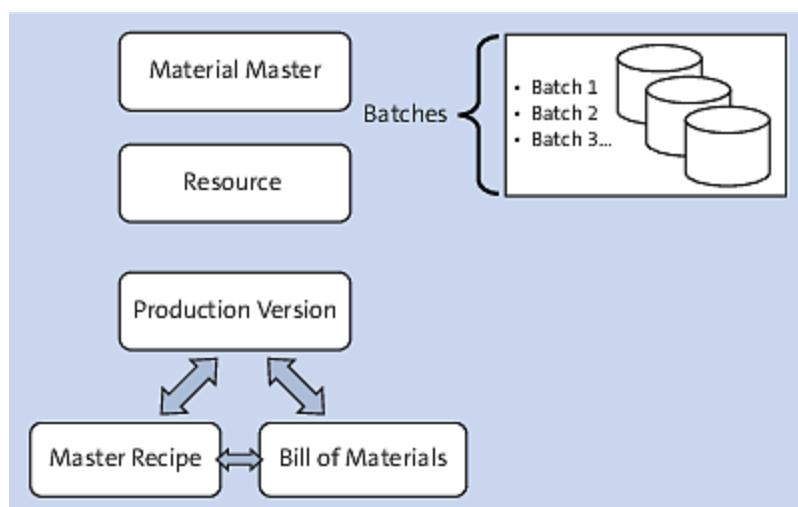


Figure 7.2 Master Data for Process Industries

7.3.1 Material Master

The *material master record* is a central repository of all information about the material or the product a company deals with commercially. This information is stored as individual records for each product. These materials can either be consumed or produced during the production process and are often identified as raw materials, semifinished products, bulk materials, packaging materials, and finished materials.

The material master is used by all components in the SAP supply chain and logistics for the following functions:

- In purchasing, for ordering external procured materials
- In inventory management, for managing stocks
- In invoice verification, for posting invoices
- In sales and distribution, for sales order processing
- In production planning and controlling, for MRP, scheduling, and work scheduling

Most of the chemical, pharmaceutical, and food and beverage industries use production planning for process industries, and these processes are generally batch oriented, so batch management is also used extensively. A *batch* is a quantity of a specific material produced during a production process with unique characteristics that can't be reproduced.

[»] Note

You should only create batches and batch master records for a material if the material is to be handled in batches. To do this, you must set the batch management indicator in the material master

record. After this indicator is set, it can only be unset provided certain conditions are fulfilled. For more details, refer to SAP Note 533383.

Batches offer unique features such as traceability, determination, and derivation. The Batch Information cockpit (Transaction BMBC) and batch where-used list (Transaction MB56) can be used to trace, find usage, or perform a complete top-down or bottom-up evaluation of material batches. The batch determination functionality is used to identify, select, and consume batches based on certain criteria. The batch derivation functionality is used to transfer batch master data and classification data of the component batches (sender) to produced batches (receiver), provided certain conditions are fulfilled.

SAP S/4HANA has introduced a new feature as a new field in the material master: **Batch Management Required Indicator (Plant)**. Businesses can activate batch management for materials (batch level = material) but deactivate batch management at the plant level. This functionality has outstretched the usage of batch management, with batch-managed materials in one plant and simultaneously nonbatch-managed materials in another plant. Batch management can now be controlled from the plants.

7.3.2 Bill of Materials

A *BOM* is a structured list of components used to make up an assembly or a subassembly. It also contains additional information such as quantity, unit of measure (UoM), scrap indicator, and usage probability.

The BOM structure is identical in production planning for process industries when compared to discrete industries. The unique part about the BOM here is that it becomes an integrated part of the task

list (master recipe) and is capable of performing functions such as MQCs. Refer to [Chapter 2](#) for more information on BOMs.

7.3.3 Resource

A *resource* in production planning for process industries is similar to a work center in discrete manufacturing. These are various kinds of production facilities or persons involved in the production process. They are classified into categories per their suitability and compatibility in a process.

The resource category controls the screen sequence and field selection, which further determines which data is to be maintained for the resource, as shown in [Figure 7.3](#). Each resource category is assigned to the applications (e.g., production, plant maintenance, or quality management) whose menus allow you to maintain the resource with this category, as shown in [Figure 7.4](#). Each resource category has a number of screens assigned that the system displays when resources of this category are displayed. The screens contain groups of fields (e.g., scheduling data). Depending on the resource

category, you can make field selections on these screens (e.g., defining required entry fields).

| Display View "Work center category": Overview | | | | | | |
|---|---------------|------|--------------------|------------|-----------|--------------------------|
| Dialog Structure | | Cat. | Description | Field sel. | Sorn seq. | Change doc |
| • Work center category | • Application | 0008 | Processing unit | 0008 | 0008 | <input type="checkbox"/> |
| | | 0009 | Personnel resource | 0008 | 0009 | <input type="checkbox"/> |

Figure 7.3 Resource Category

| Display View "Application": Overview | | | | | | |
|--------------------------------------|---------------|------|-----------------|-----------|---------|--|
| Dialog Structure | | Cat. | Appl | Descript. | | |
| • Work center category | • Application | 0008 | Processing unit | C | Recipes | |

Figure 7.4 Resource Category Assignment to Application

A few standard resource categories are available in the system:

- **Labor**

Labor resources are people who are involved in the manufacturing process and have a certain capacity. Qualification- and performance-related data helps businesses decide how the resources are deployed.

- **Processing unit**

Processing units are resources directly involved in the production process. They have their own capacities, which serve as a basis for scheduling.

- **Storage resources**

During the manufacturing process, material is sometimes temporarily stored between phases, requiring storage resources that act like a temporary storage location for materials.

Resources are assigned to operations and phases in the master recipe. Based on the category of the resource, you can assign the

data as follows:

- **Primary resource**

The resource occupies the entire duration of the operation and its phases.

- **Secondary resource**

Additional activities have to be performed when an operation and phase are carried out. These resources automatically don't occupy the entire operation/phase duration.

- **Scheduling**

Operating times and formulas for calculating the operation duration are maintained in the *Scheduling* tab of the resource.

- **Costing**

Formulas for calculating the operation costs are maintained in the resource. A resource is assigned to a cost center.

- **Capacity requirements planning**

Formulas for calculating capacity requirements for an operation/phase are maintained in resources.

7.3.4 Production Version

In process manufacturing, a *production version* determines which alternative BOM is used together with which task list/master recipe to produce a material. One material can have several production versions based on lot sizes and validity, and it's mandatory to have at least one.

If you've created a production version for material and assigned the BOM alternative, the material components of the relevant alternative BOM are available in the recipe as a material list or can be created from within the recipe. Production versions can be created in the

MRP4 view of the material master or by using Transaction C223. (See [Chapter 2](#) for more information on this.) After this is done, then additional functions such as the component assignment to operations and phases and the formulas for MQC can be done. In the production version, you can also assign the receiving storage location to the material you want to produce, thus specifying that the material is stored there after production.

Later, a consistency check is performed to ensure that the data of a production version is consistent with the data of the assigned task lists/master recipes and the assigned alternative BOM C223. In this way, you make sure that a valid task list or valid BOM really exists for the entire validity period of the production version.

[»] Note

If a material has multiple production versions, a mass consistency check can be performed using the function. In the SAP menu, choose **Logistics • Production • Process • Master Data • Master Recipes • Reporting • Production Versions Production Version List**.

7.3.5 Master Recipe

The *master recipe* is a task list that describes enterprise-specific processes in process industries without relating to a specific order. That is, the master data of master recipes describes the manufacture of one or more materials in one production run without relating to a particular order. During process order creation, a master recipe is usually selected through a production version and used as the basis for the process order. A production version determines which alternative BOM is used in combination with which master recipe for

process order manufacturing. Material BOMs describe the structure of products that are produced in a company. These BOMs usually are created and maintained from within the master recipe (integrated maintenance). The approval procedure for master recipes and all the other functions for planning and documenting changes enable you to meet the most important requirements of GMP. In the following subsections, we describe the various aspects of master recipes, including their structure and creation, operations and phases, and relationships between master recipe phases.

Structure and Creation

A master recipe consists of a header and one or multiple operations, each of which is further assigned to a primary resource. An operation is subdivided into phases. In process industries, scheduling, capacity planning, and costing are all carried out at the phase level. A phase is a process step that contains the detailed information of the entire manufacturing process. Phases are carried out at the primary resource of their superior operation

A high-level structural view of the master recipe is presented in [Figure 7.5](#).

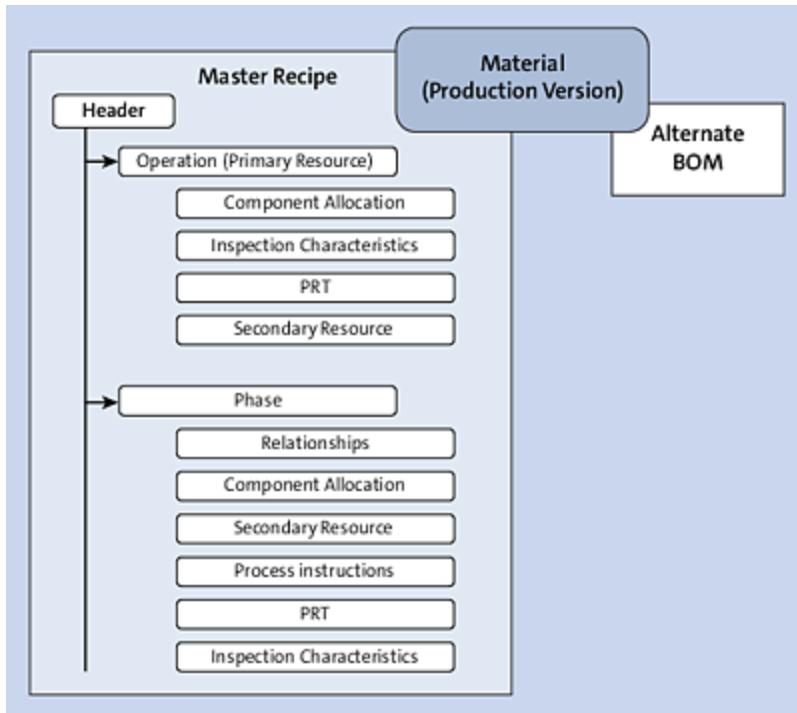


Figure 7.5 Master Recipe Structure

The master recipe profile is used while creating the master recipe. The profile can be configured via SAP IMG path **Production Planning for Process Industries • Master Data • Master Recipe • Define Profile with Default Values** or via Transaction OPN1.

Options for process management can be controlled using the profile. The standard system offers three options in the **Process instruction maintenance** field in the **Process management** area of the **Change View ""Default Values for Master Recipe""**: **Details** screen, as shown in [Figure 7.6](#):

- **Process Instructions**
- **XSteps (Execution Steps)**

- XSteps Optional

The screenshot shows the SAP Change View for the "Default Values for Master Recipe": Details. The profile is set to PI01, which is a "Profile for Process Industry". Under the "Operation" section, the control key is PI01 (Process manufacturing) and the operator/actual increment is 0010. The relationship view is set to "Successor" and the level of detail is 98. In the "Process management" section, the process instruction maintenance is set to "Process Instructions". The group is PI01 and the name is NETWORK. The operation display is "Operation is displayed as medium node in graphics", phase display is "Phase is displayed as medium node in graphics", and relationship display is "By relationship type". The change rule is set to "No".

Figure 7.6 Master Recipe Profile

If you select **XSteps Optional** during the master recipe creation, the system provides you the option to either select **Process Instructions** or **XSteps**. You can't use both of them at the same time in the master recipe.

The master recipe can be created either with or without reference to a material or using the copy function. Before creating the master recipe, you can have the production version created with only BOM details mentioned.

[»] Note

The production version is mandatory in the master recipe.

To create a master recipe for which the production version already exists, use the SAP menu path **Logistics • Production • Process • Master Data • Master Recipes • Recipe and Material List • Create**. Alternatively, you can use Transaction C201, as shown in [Figure 7.7](#).

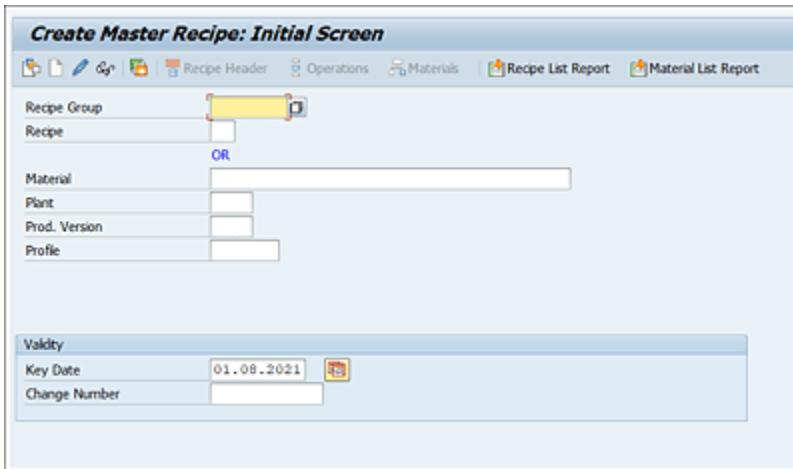


Figure 7.7 Master Recipe Initial Screen

The **Key Date** here is the valid from date of the master recipe, so that it becomes available for use in various applications. If not maintained manually, the default system date during recipe creation becomes the **Key Date**.

[Figure 7.8](#) shows that the default values for operation/phase quantity are maintained here (**Default Values for Operations, Phases, and Secondary Resources** section), along with the proportion factor between the task list unit (**TaskL Unit**) and operation unit (**Op. unit**). The data at the header level is valid for the entire master recipe. The **Status** must be set to **Released** and **Usage** to **Production** to be used for process orders. The **Charge Quantity Range** contains the lower (**From**) and higher (**To**) values, along with its unit within which the master recipe is valid.

The master recipe can also be classified according to your own requirements. This also adds an additional criterion for selecting master recipes using filters. Classes of class type 018 can be used for recipe classification, and defined characteristics can be assigned to these classes.

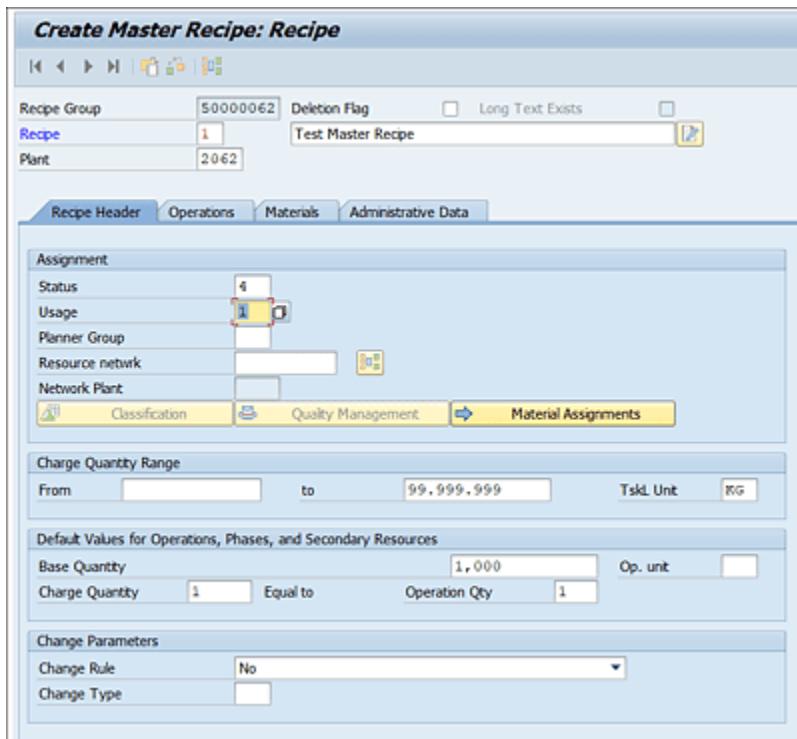


Figure 7.8 Master Recipe Header

The Material Assignment to Recipe function is used to determine which material is going to be produced using this master recipe. You can assign the material into a recipe by directly going into the recipe header and then choosing **Material Assignments**. This assignment enables the system to perform planning, task list selection during order creation, and product costing for this material. A single recipe can be used to produce several different materials. In scenarios

where you have separate planning and production plants, the recipe and materials can belong to different plants.

[»] Note

Multiple materials can be assigned to a recipe group.

Because the master recipe integrates both the operations and alternative BOM, a production version must be assigned at this stage. After the assignment is made, the BOM explosion takes place, and all the components are copied to the master recipe. The component assignment to the operation/phases can also be done later.

Operation and Phases

[Figure 7.9](#) shows the operations that describe the sequence of steps required during the production process. An operation is a process step that describes the manufacturing process in detail.

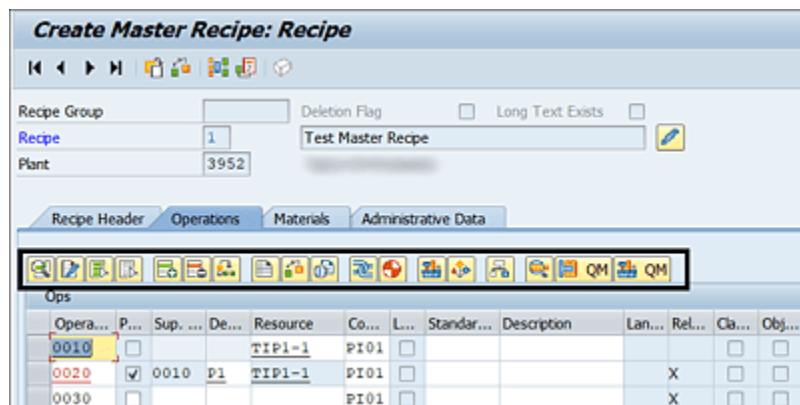


Figure 7.9 Master Recipe Operations

For a more detailed description of these steps, phases are assigned to the operations. A resource is assigned to each operation. This resource assignment also applies to all phases assigned to the

operation. The phases' processing sequence in time is defined in relationships. Standard values are maintained at the phase level, as well as scheduling, capacity calculations, costing, and confirmation posting. Additionally, you can also maintain the following:

- External processing data that is used as a basis for ordering, scheduling, and costing externally processed phases
- User-defined fields with any customer-defined data
- Inspection specifications for the quality inspection to be carried out for the operation
- Production resources tool (PRT)

You assign a resource at the operation level. The phases linked to the operation then copy the resource that you assigned at the operation level. The standard values and activities (controlled by a control key in the resource) are then active at the phase level. The activity times and the various standard values can be maintained here. The sum of standard values at a phase is the total time required to process the operation. Component assignment of the BOM (materials list) is possible at phases but not at operations. To create a phase with reference to an operation, you need to select the **Phase** checkbox in the **Operations** tab for the operation line item, which then automatically copies the resource from the operation. At the same time, when defining a phase, you also have to assign the superior operation so that the system knows which specific phase relates to which operation.

Phase Relationships

Relationships can be used to link phases to each other in terms of time in a master recipe or process order. Phases can be executed in parallel order or can be overlapping, depending on the business

process. Multiple relationships can be defined for each phase of a master recipe.

Relationships link the start or end of a preceding phase with the start or end of a succeeding phase. The relationship type specifies how the phase dates are linked with each other. [Figure 7.10](#) shows the types of relationships and their definitions.

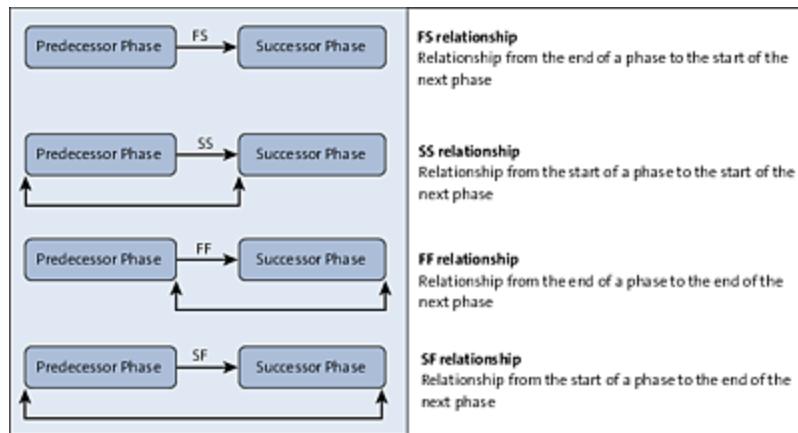


Figure 7.10 Master Recipe Relationship

You can also define offsets for a relationship. This determines how much time lies between the dates of phases linked to each other.

You can define offsets as follows:

- As a positive value, if the reference date (start or end) of the successor phase is after that of the preceding phase.
- As a negative value, if the reference date (start or end) of the successor phase is before that of the preceding phase.

7.4 Process Order Configuration

To create process orders successfully and perform the steps in their execution cycle, certain configurations must be in place to help define the overall process control:

- **Define order types**

To control particular functions and information, an order must be assigned to an order type. Each order type belongs to a particular category. For example, the order category is 40 for process orders and 10 for production orders. These order categories are predefined in the SAP system and control the technical characteristics of the order. [Figure 7.11](#) shows an SAP standard **Order Type PI01** belonging to **Order Category 40**. The business functions include the following:

- CO Partner
- Classification
- Reorganization
- Cost Accounting Profiles
- Status Management

To settle the costs of the order, a settlement profile is needed. In a settlement profile, you define a range of control parameters for settlement. You must define the settlement profile before you can enter a settlement rule for a sender. The **Settlement Profile** is maintained in the order type and defaults during creation of the order. The **Status Profile** is assigned in the **Status Management** section. You define various user statuses within the **Status Profile** with their sequences. Each user status gets a status number. You can then decide which user status is automatically set as the

default whenever an object is created. With this approach, you can create functions such as allowing or blocking a certain business transaction when a certain status is active.

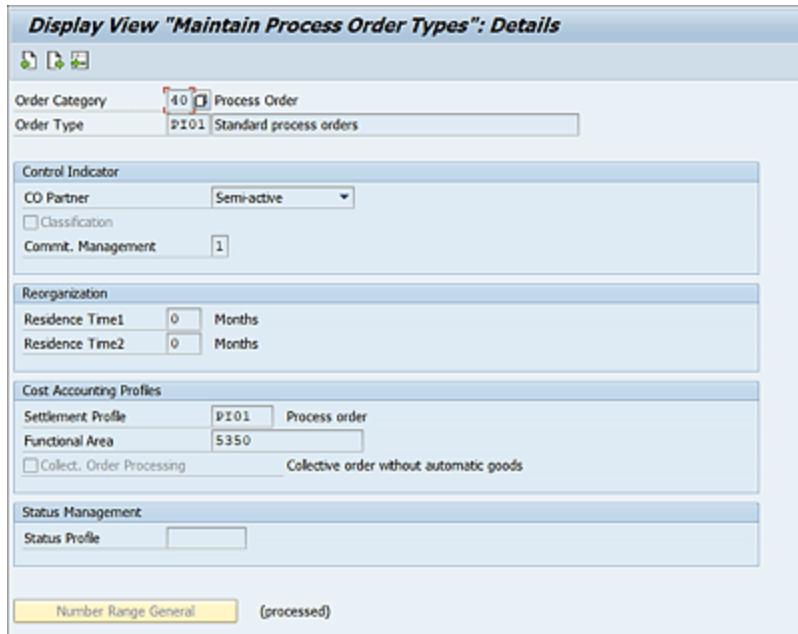


Figure 7.11 Define Order Types

To create or define a new order type, use SAP menu path **SAP IMG • Production • Planning for Process Industries • Process ORDER • Master DATA • Order • DEFINE Order Type**. Alternatively, you can use Transaction CORN.

- **Number ranges for process orders**

Each order is uniquely identified by an order number within one client. You allocate each order to a number range group via the order type. You can also allocate several order types to the same number range and thus the same interval. [Figure 7.12](#) shows the

order type assignment to a group. Each of these groups belongs to a number range.

| Group Overview: Order, Object AUFTRAG | | | | | | |
|---------------------------------------|---------|--|-------------|-----------|--------------|--------|
| Group | Element | Element Text | From Number | To Number | Number Range | Status |
| Internal Number Assignment | | | | | | |
| | CROM | Standard CO Production Order | 1000000 | 1999999 | 100385P | |
| | P101 | Standard process orders | | | | |
| | P102 | Process order (external number assignment) | | | | |
| | P104 | Filling/packaging with "Assembly order" | | | | |
| | P101 | Standard production order | | | | |
| | P104 | Assembly order | | | | |
| | P1C1 | Order Type for coating | | | | |
| | P1W1 | Production order for Kanban | | | | |
| | TRM1 | MTR Production Order | | | | |

Figure 7.12 Process Order Number Range

- **Internal number assignment**

When you create an order, the SAP system automatically assigns a consecutive number from the number range that you've defined. If you enter an order type that requires an internal number assignment, the system automatically assigns a number when you save the process order.

- **External number range assignment**

If you've selected an order type that requires an external number assignment, you must also enter an order number in the Process Order field.

To create a number range, you can use the IMG path **Production Planning for Process Industries • Process Order • Master Data • Order • Number Ranges • Define Number Ranges for orders** or use Transaction CO82.

- **Order-type-dependent parameters**

Various parameters can be controlled at the plant level along with the combination of order type. You can create different order types within a plant. For example, if your manufacturing process is divided into steps, then each step can have its own order type. Another example may be having one order type for regular production and one for rework. Each order type can have a

separate number range and its own order type settings. Further, you can control functions such as user authorization based on the order type and plant combination or control for printing shop floor papers. The setting made here becomes immediately effective whenever you create a process order for that specific order type and plant combination. [Figure 7.13](#) and [Figure 7.14](#) shows the various parameters that can be controlled in the configuration of order-type-dependent parameters.

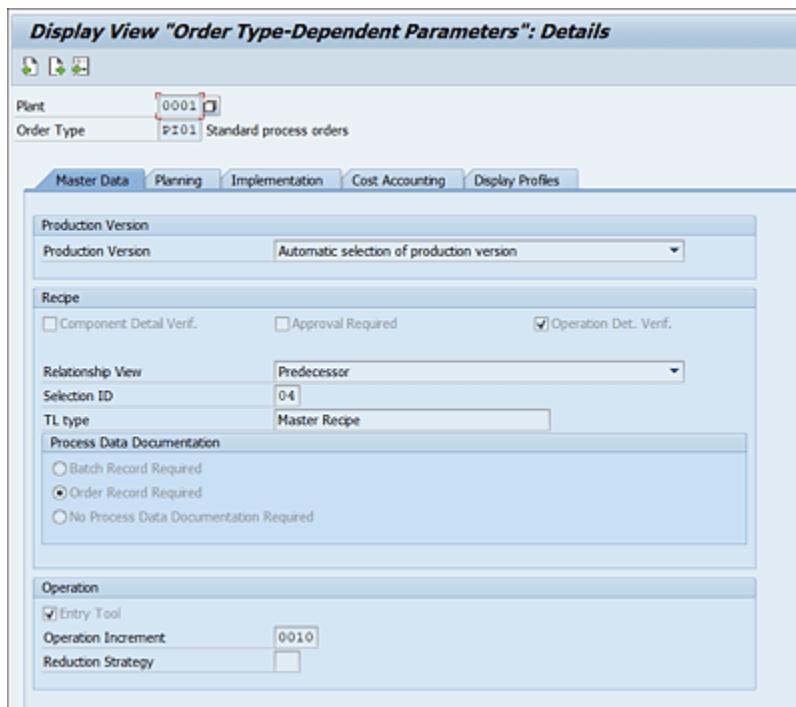


Figure 7.13 Order-Type-Dependent Parameter: Master Data

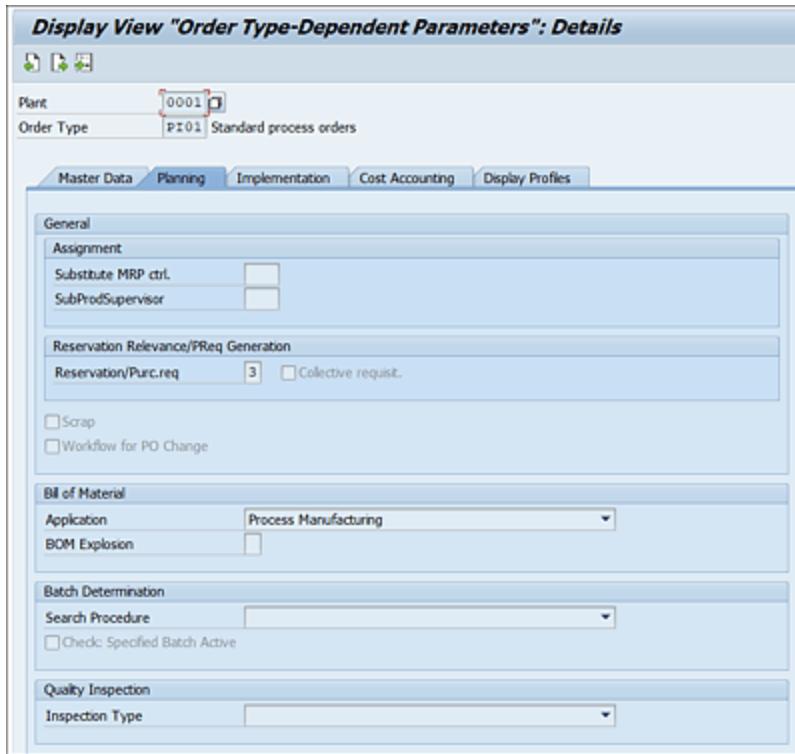


Figure 7.14 Order-Type-Dependent Parameters: Planning

To define order-type-dependent parameters for plant/order type combinations, use SAP menu path **SAP IMG • Production Planning for Process Industries • Process Order • Master Data • Order • Define Order Type Dependent Parameters**, or use Transaction COR4. The five tabs in this configuration node, **Master Data, Planning, Implementation, Cost Accounting, and Display Profiles**, are described here:

- **Master Data**

In this tab, you can control whether the selection of production version should occur automatically or manually. You can select either option from the **Production Version** dropdown. If **Automatic selection of production version** is selected, the system assigns the first available production version valid version. If **Manual selection of production version** is selected, then the system opens a popup with the list of

production versions during the process order creation stage to enable you to select a production version manually. Enabling the **Component Detail Verif.** and **Operation Det. Verif.** options specifies that all the data in the component and operation views, respectively, is checked while getting transferred from the master recipe to the process order.

For production in compliance with GMP, process orders must be approved before production activity begins. To enable this feature, the **Approval Required** indicator must be selected. This indicator specifies that orders of this order type and plant combination required approval before they are released. A standard process can be approved in two ways:

- Using an approved recipe
- Approving an individual order (**Process Order • Functions • Approval(G) • Individual Approval**)

- **Planning**

In this tab, you can activate the **Scrap** indicator to specify that scrap is expected for the order, and the quantity can be specified either at the order header level or while posting confirmation for operations/phases. You can also specify the **Search Procedure** to be used for batch determination in process orders. The search procedure contains different strategy types in sequence that are relevant for the business transaction. You can also assign an **Inspection Type** to be used for process inspection for an order and plant combination.

- **Implementation**

In this tab, indicators for **Shop Floor Information System** and **Documentation of Goods Movement** are activated ([Figure 7.15](#)). These indicators are relevant for the Logistic

Information System (LIS). If these indicators aren't activated, then the LIS won't get updated, and you won't have the provision to see the documented goods movements for the process orders. The **Post Goods Movement for WIP Batch** indicator can also be activated here to enable you to post goods receipt for a work in process (WIP) batch.

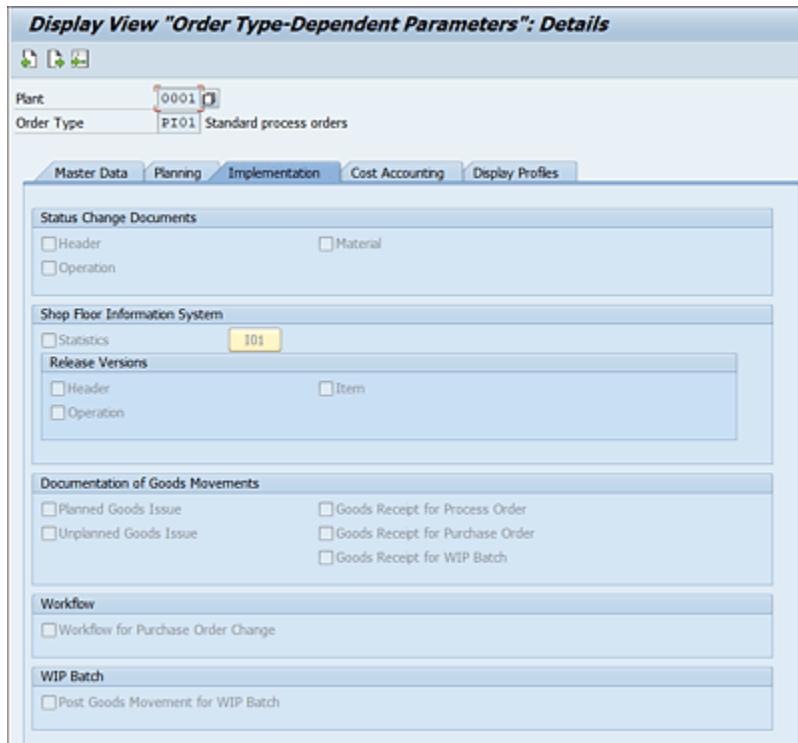


Figure 7.15 Order-Type-Dependent Parameters: Implementation

[»] Note

Refer to SAP Note 1473025 for more details and FAQs related to WIP batches.

- **Cost Accounting**

You define the costing variant for planned and actual cost and parameters on how cost is calculated, distributed, and settled. It's an integration object between production planning and

controlling. You can connect with the controlling resource to understand this concept in more detail.

- **Display Profiles**

This tab displays the **Production Scheduling Profile**. If there are certain processes or business transactions ([Figure 7.16](#) and [Figure 7.17](#)) that need to run in parallel with process orders, then those processes can be controlled using **Production Scheduling Profile**, such as the following:

- **Order Release at Order Creation**
- **Scheduling on Order Release**
- **Printing on Order Release**
- **Generate Control Recipe on Order Recipe:** This function is limited to process industries only.
- **Confirm Available Partial Quantity:** This ensures that the order is only committed to the extent that it can be produced.
- **Controls the Batch Creation Criteria for Process Orders Header:** No batch/auto batch.
- **For Warehouse-Managed Order Components:** The control for creation of transport requirements.
- **Assignment of Default Order Type for the Profile:** When an order for material with the profile is created, the default order type is proposed.

To configure the production scheduling profile, follow the menu path **SAP IMG • Production Planning for Process Industries • Process Order • Master Data • Define Production Scheduling Profile**, or use Transaction CORY.

Display View "Production Scheduling Profile": Details

Plant: 0001
PS Profile: PI01 Process industry

Automatic Actions

| | |
|----------------------------------|---|
| On Creation | On Release |
| <input type="checkbox"/> Release | <input type="checkbox"/> Generate Ctrl Recipe <input type="checkbox"/> Execute Printing <input type="checkbox"/> Carry Out Scheduling |

Material Availability Check

| |
|--|
| <input type="checkbox"/> Confirm Available Partial Qty |
|--|

Capacity Planning

Leveling
Overall profile: SAPPI_G001 PI: View work center/capacity (graph.)

Availability Check

| | |
|---|--|
| <input type="checkbox"/> Confirm Capacity | <input type="checkbox"/> Finite scheduling |
|---|--|

Batch Management

| | |
|--|---|
| Auto Batch Creation | No Automatic Batch Creation in Production/Process Order |
| Classify Batches | No Branching to Batch Classification |
| <input type="checkbox"/> Extended Classification | |

Transport

| | |
|---|---|
| <input type="checkbox"/> Compl. Transfer Rqmt | <input type="checkbox"/> Confirmed Quantity for TR |
| WM Request | No Creation of Transfer Requirements on Order Release |
| <input type="checkbox"/> GI via delivery | |

Figure 7.16 Production Scheduling Profile

Confirmation

| | |
|--|---|
| <input type="checkbox"/> No Update of Excess Receipt | <input type="checkbox"/> No Update of Short Receipt |
|--|---|

Order Type

| | |
|---------------|------------------------------|
| Make-to-stock | PI01 Standard process orders |
| Make to Order | |
| W/o Material | |

BBD/SLED

| | |
|--|--|
| <input type="checkbox"/> Copy BBD/SLED to Batch Master | <input type="checkbox"/> Recalc. BBD when Rescheduling |
|--|--|

Figure 7.17 Production Scheduling Profile (cont.)

7.5 Process Order Processing

Process order processing comprises several steps ([Figure 7.18](#)) that can be broadly divided into the following parts:

- Process planning
- Order execution/process management
- Order closing

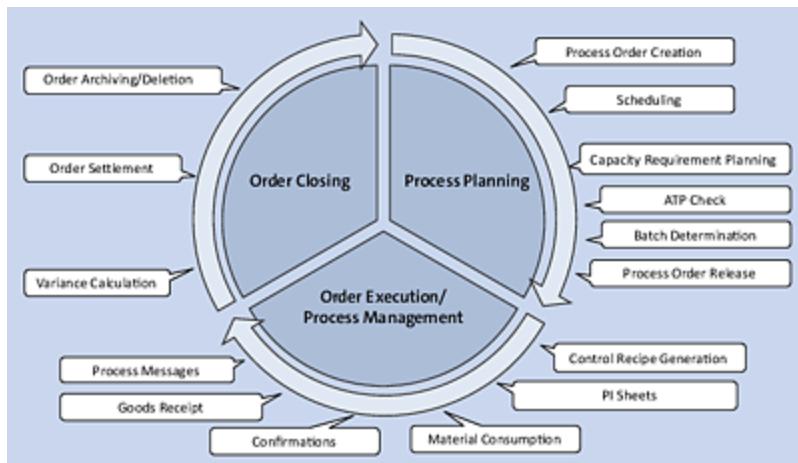


Figure 7.18 Process Order Cycle

We'll discuss each part in the following sections.

7.5.1 Process Planning

Process planning comprises the activities that are involved during the creation and release of a process order. It involves the following steps:

1. Order creation

MRP forms the basis of planning in production planning. The output of the MRP run is a plan order for the material that will be produced in-house. This plan order can be converted to a

process order, and a process order can also be created manually. The system copies all the data contained in the planned order, such as order quantity and order dates. When the system selects a valid master recipe, all the recipe data (e.g., operations and phases, resources, and material list components) is copied into the process order.

Alternate ways of creating process order are as follows:

- Collective conversion: n planned orders → n process orders, using Transaction COR8 if several planned orders exist in the same plant to simultaneously convert them into process orders via collective conversion
- Individual conversion: 1 planned order → 1 process order, using Transaction COR7
- Partial conversion: 1 planned order → n process orders, using Transaction COR7_PC
- Manually using Transaction COR1
- With reference to a material but without a master recipe with customizing for default values for automatic generation of operation
- With an approved master recipe where engineering change management (ECM) is activated
- Without reference to a material but using a master recipe via Transaction COR0
- With a reference, you can select an object by choosing Continue (settlement rule, operations, material,

relationships, process instructions) or by entering a sales order

[»] Note

The order type is determined from the production scheduling profile of the material to be produced, or it can also be manually entered.

2. Scheduling

The scheduling functionality calculates the production dates (start and end) and capacity requirements for all operations for a process order. With these dates, the process orders are forward scheduled backward scheduled. The system determines the planned start and finish dates for the order, as well as its phases and operations.

[»] Note

The scheduling type or direction of the order type is determined from Customizing scheduling parameters using Transaction

OMIZ, as shown in [Figure 7.19](#).

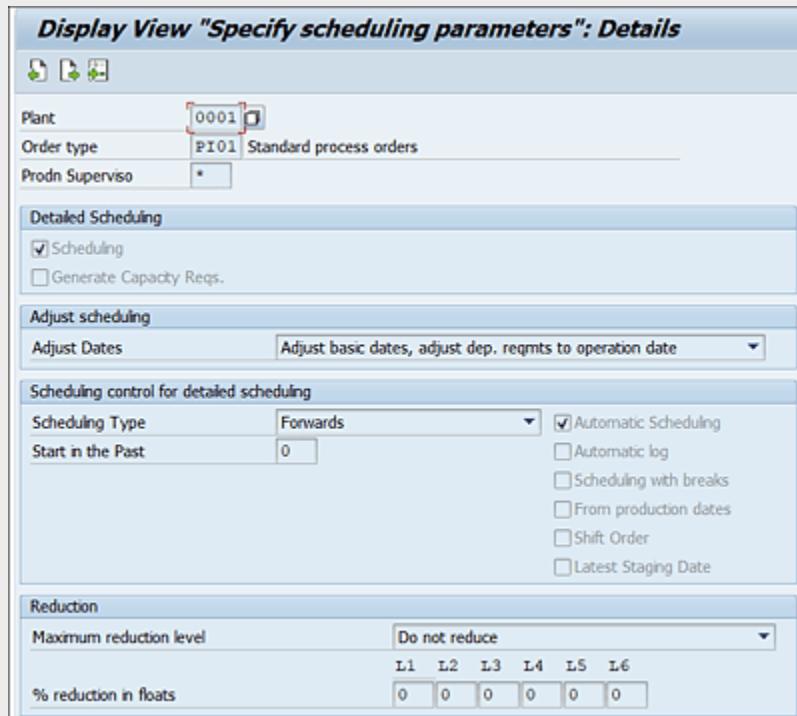


Figure 7.19 Process Order Scheduling Parameter

Depending on the scheduling type, the float before production is either added to the order start date or the float after production is subtracted from the order finish date to determine the start or finish date of the production (scheduled start date, scheduled finish date). The float before production and float after production are time buffers enabling you to react to malfunctions or unplanned breakdowns in the production process. Floats are determined using the schedule margin Key ([Figure 7.20](#)), which is maintained in the MRP view of the material master.

| Display View "Margins for scheduling": Overview | | | | | |
|---|-----|----------------|------------------------|-------------------------|----------------|
| Plant | Key | Opening Period | Float After Production | Float Before Production | Release Period |
| 0001 000 | 0 | 0 | 0 | 0 | |
| 0001 001 | 10 | 1 | 2 | 5 | |

Figure 7.20 Schedule Margin Key

The system determines the start and finish dates of the phases starting from the scheduled start and finish dates. To do so, it must determine the phase durations and take relationships into account. The release date for the order is determined by subtracting the release period from the scheduled start date. The release date is used as a selection criterion for the collective release of process orders.

To calculate the phase duration for a process, you must define a capacity category to be used as the scheduling and a formula in the resource under the **Scheduling** tab. The phase duration is calculated using standard values maintained in the master recipe and then using the formula.

When determining the phase dates, the available capacity of the resource is considered. The capacity requirement is calculated during scheduling. The dates for the calculated capacity requirements are identical to the dates of the operation.

[»] Note

In production planning for process industries, scheduling is carried out at the phase level.

3. Availability checks

Availability checks for material components during order creation or release ensures that only those orders are released for which the required material quantity is available on the calculated requirements date. The availability check can be triggered

automatically or manually. You can also perform a collective availability check.

[»] Note

In Customizing for **Configure Scope of Availability Check for Production and Process Orders** (Transaction OPJK), you specify for each order type and plant combination whether an automatic availability check is to be carried out. Furthermore, you define whether the availability is to be checked during order creation and/or order release.

A manual check can be carried out anytime. You can either check the availability in a collective check for all components (automatically or manually using Transaction COMAC) or in a separate check for each component.

All receipt and issue elements to be considered are checked dynamically according to the ATP method. Material quantities, including partial quantities, that are available at the requirements date are confirmed in the order. If the total required quantity of a material component isn't available at the required date, the system sets the order status **Material Shortage (MSPT)**. In Customizing, you can control whether orders with a material shortage are allowed to be released or not. You can display missing parts for the order in the missing parts overview within the process order.

The results of the availability check are recorded in the availability log. The logs can be viewed via **Process Order • Go To • Logs • For Release**. Availability checks are carried out according to checking rules that are defined in Customizing with

reference to a material or application. The scope of the availability check is specified for each material and order type.

4. Order release

To enable certain business functions and start the order execution process, process orders must be released. Releasing the order will set the order header status to **REL** and enable the following:

- You can post confirmations for the order.
- You can trigger the printing of shop floor papers.
- You can generate a control recipe.
- You can carry out goods movements for the order.

[»] Note

You can also release individual operations/phases of the process order. If you release an operation, all the phases belonging to this operation are also released automatically. If all the operations in the order aren't released, then the order header is updated with the status **Partially Released (PREL)**. After you've released all the operations of a process order, the order automatically receives the status **Released (REL)**.

7.5.2 Order Execution

The process order release marks the end of the planning process and the beginning of the execution. The order is now ready to carry the business functions involved in its execution cycle. In process management, the control recipes containing the instructions are transferred to the PCSs. The activities related to order executions

are performed then. The following subsections will cover the steps involved in process management and order execution.

Process Management

Various types of control systems are available that are used by process industries. The production lines are connected to these control systems with varying degrees of automation. SAP has designed the PI-PCS interface to link production planning for process industries with these production lines. Process management is used to exchange the production-relevant data between the SAP system and the control system (an external system). The exchange can be partially automated, fully automated, or manual. [Figure 7.21](#) shows the overview of process management.

Process management includes the following functions:

- Receive control recipes with process instructions from released process orders. The process instructions contain the process steps to be executed and the process data to be confirmed in detail.
- Send control recipes to the corresponding process operators or PCSs.
- Display text instructions maintained in the process instructions in the form of PI sheets that can be displayed and maintained on the screen by the process operator manually.

- Receive, check, and send process messages with actual process data from the PCS or the PI sheet.

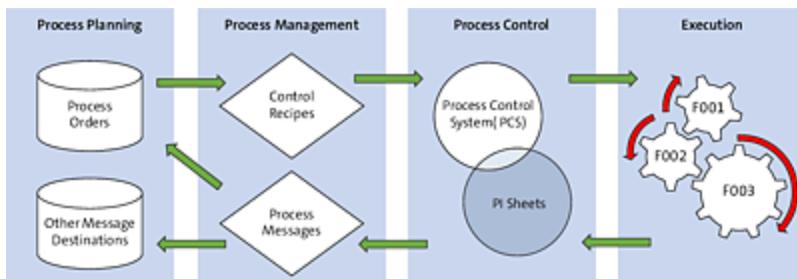


Figure 7.21 Process Management Overview

The control recipe destination is the technical address (RFC destination of the PCS system) to which a control recipe is transferred, as shown in [Figure 7.22](#). This can be a PCS, line operator, or a group that executes the control recipes. Each phase in the master recipe is assigned to a control recipe destination, which can be customized in **Process Control • Control Recipes/PI Sheets • Define and Set Up Control Recipe Destinations**.

| Display View "Maintain control recipe destinations": Overview | | | | |
|--|----------------------|----------------------|------|--|
| Display Structure | | | | |
| Maintain control recipe destination <ul style="list-style-type: none"> Process instruction assignment Process instructions for bc... | | | | Part 3952 |
| Maintain control recipe destinations | | | | |
| CRD | CRD Description | Destination address | Type | Destination Type Short Descript. |
| M1 | MES SEED RECIPE | MES# REEDS RECIPE | 1 | Transfer to ABAP list-based PI sheet |
| P1 | Seeds Control recipe | SEEDS CONTROL RECIPE | 1 | Download to ext. system, initiated by SAP process management |
| | | | | Download to ext. system, initiated by ext. process control |
| | | | | Transfer to browser-based PI sheet |

Figure 7.22 Control Recipe Destination

The destination type specifies the following:

- **1: Transfer to ABAP list-based PI sheet**
- **2: Download to ext. system, initiated by SAP process management**
- **3: Download to ext. system, initiated by ext. process control** (control recipe transfer to the external system is initiated by the external system)

- 4: Transfer to browser-based PI sheet (displayed in HTML layout on the screen)

Process Instructions

In the process instructions, you can define the execution steps that a process operator needs to follow at the production line during the execution process or PCS system to execute automatically. Process instructions are defined in the master recipe and in the process order.

You have the following options to maintain process instructions:

- **Characteristics-based process instructions and category**

Under the process instruction configuration node, you define characteristic-based process instructions (see [Figure 7.23](#)). That is, you define the process instructions with reference to a characteristic along with their values. Process instructions are then created and assigned for a phase. These process instructions are further assigned to the process instruction category. These process instruction categories must be created in Customizing for process management before the assignment happens. These act as a template for the characteristic-based process instructions that you can edit in the process instruction overview of the master recipe and the process order. Every process instruction category that you create in Customizing must also be assigned to a process instruction type.

| Display View "Characteristics Groups": Overview | |
|---|--------------------------------------|
| Group | Char. Group |
| PPPI_01 | Process Message Characteristics |
| PPPI_02 | Process Instruction Characteristics |
| PPPI_03 | Char. for Material Flow Betw. Orders |
| PPPI_04 | Special Applications |

Figure 7.23 Process Instruction Characteristics Group

The process instruction type determines which functions are to be supported in the process instruction category. Depending on whether the process instruction category is defined for the PI sheet or a PCS, you must use the corresponding process instruction type.

- **Process message**

This component is responsible for sending actual data from the process control to predefined message destinations. Depending on the destination type, various business transactions are triggered in this way in the SAP system or an external system, and data is reported.

The standard system contains process message characteristics for the process messages predefined by SAP. Each process message sent via process management must belong to a predefined message category. The process message categories contain the process instruction characteristics, message destinations, and the characteristics the destination needs to update. Standard SAP contains several process messages that can be transported to the local client; in addition, you can create new messages with destinations per the business need.

Process messages can be sent to one or more destinations for further processing. They can be sent to the following destination types, for example:

- SAP function module
- User-defined custom tables
- External systems (e.g., a PCS)
- SAP Alert Management system

The standard system contains predefined message destinations for SAP function modules. These can be used to perform certain activities and functions such as the following:

- Update the control recipe status.
- Post time tickets for the phases of the process order.
- Post goods movements for the process order.
- Record inspection results to quality management against the lot.

SAP has provided standard message categories that can be leveraged to perform certain business functions. The most common ones are listed here:

- **Goods issue**
 - PI_CONS: Material Consumption
- **Confirmations**
 - PI_PHST: Message on Phase Start (Time Event)
 - PI_SRST: Message on Secondary Resource (Time Event)
 - PI_PHACT: Message on Activities (Time Event)
 - PI_SRACT: Message on Activities (Sec Resource)
 - PI_PHCON: Time Ticket Confirmation for Phase
 - PI_SRCON: Time Ticket Confirmation for Secondary Resource
 - PI_ORDCO: Process Order Confirmation
- **Goods receipt**
 - PI_PROD: Material Receipt

[»] Note

You can use a wizard to help you define the category of each process instruction type.

- **XSteps**

The XSteps process describes the execution steps of production processes and can group and structure this information in the form of modules. XSteps can be structured in hierarchical form to create XStep trees. The execution steps described in XSteps are grouped together to form control instructions and sent to the PCS system or shop floor, depending on whether the process is automatic or manual.

[»] Note

To maintain XSteps in the master recipe, you must select an appropriate recipe profile when creating the recipe group.

- **Control recipes**

When you create the control recipe, the process instructions are generated in the specified positions of the control recipe. Control recipes can be generated automatically at order release by using the appropriate production schedule profile for the material that has enabled **Generate Cntrl Recipe at release**.

[»] Note

Program RCOCB006 can be scheduled as a background job for triggering the control recipe.

The control recipe monitor is a report or a tool that enables you to display all control recipes with their processing statuses. It displays the detailed logs documenting the processing of individual control recipes. Based on this information, you can then either send or delete the control recipe. You can use Transaction CO53 to access the **Control Recipe Monitor: Initial Screen**, as shown in [Figure 7.24](#).

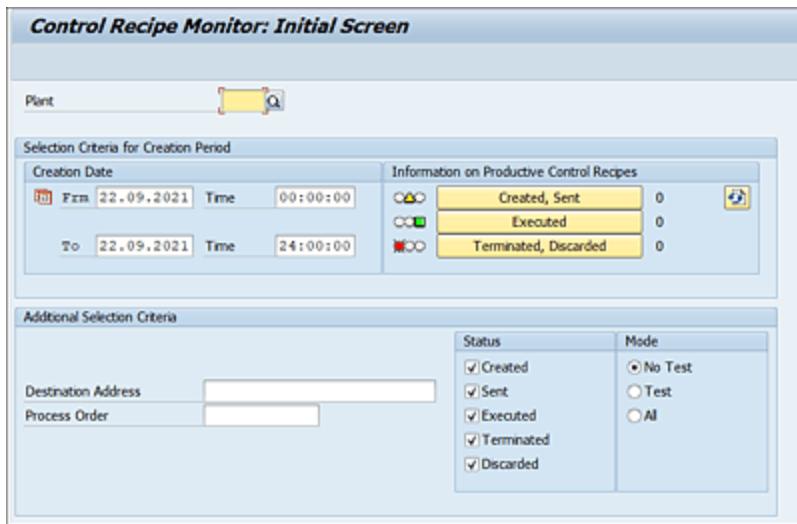


Figure 7.24 Control Recipe Monitor

[»] Note

You can choose to print a control recipe by choosing **Control Recipes • Print**.

- **Process message monitor**

The process message monitor is a report or a tool that enables you to display all process messages, check their processing status, and correct errors if necessary. These messages are displayed with their creation time, message category, sender, and send status. The messages have traffic lights using different colors according to their status so that you can quickly spot those

with errors. For detailed information on the errors, you can refer to the corresponding message logs. You can use Transaction CO54 to access the **Process Message Monitor: Initial Screen**, as shown in [Figure 7.25](#).

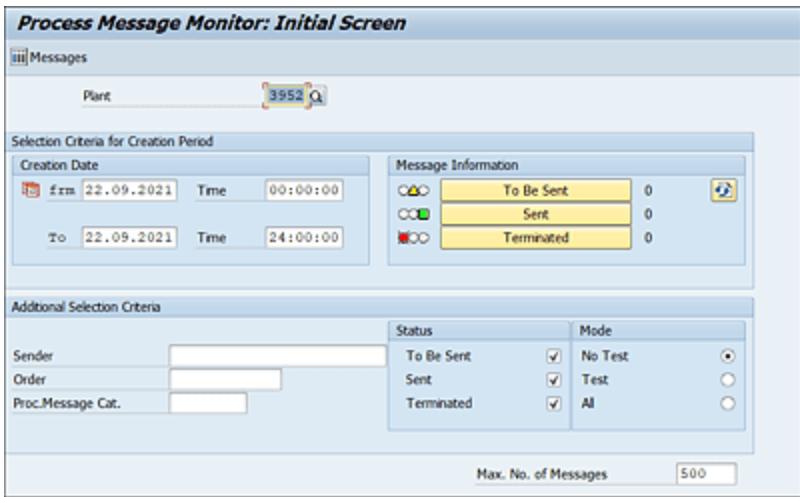


Figure 7.25 Process Message Monitor

- **PI sheets**

In process management, the process instructions maintained in the order are passed into control recipes. These control recipes are either transferred to a PCS via an interface, or they are displayed as instructions in the form of a PI sheet that can be maintained by the resource operator. PI sheets in general describe either a partial or total production process. Thus, it helps the process operator know the steps that need to be performed for a particular operation/phase. PI sheets can be designed in a way that the user can enter material consumption. These consumptions get posted into inventory management as material withdrawals. Process messages can be used to perform the function automatically. The user can create two types of PI sheets:

- ABAP-based PI sheet (control recipe destination type 1)
- Browser-based PI sheet (control recipe destination type 4)

You can use the **Find PI Sheet** function via Transaction CO60 (see [Figure 7.26](#)) to search and find PI sheets according to filter criteria. When you find a PI sheet with **New** or **In Process** status, this means that you can enter data, carry out calculations, make function calls, and create process messages in these PI sheets. After this step is carried out, you can check and complete the PI sheet.

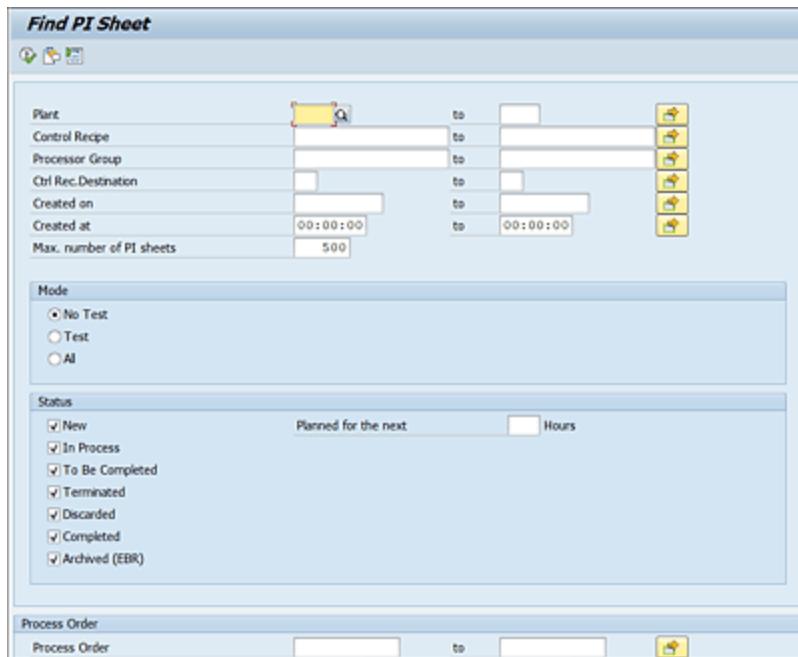


Figure 7.26 Finding PI Sheets

- **Manufacturing cockpit**

Process manufacturing cockpits are user-defined screen layouts that can be customized to suit your business functions using process messages. The cockpit can serve multiple purposes:

- Display the detailed process instructions to the user on a production process or a step.
- Send malfunction or breakdown reports to a concerned department.
- Perform calculations.

- Record results and send inspection data to the department periodically.

To access the process manufacturing cockpit, use the menu path **Logistics • Production • Process • Process Management • Manufacturing Cockpit • Start**, or use Transaction COPOC.

Material Quantity Calculation and Batch Determination

In MQC, you define formulas to calculate the material quantities to be used in a production process by considering the mixing ratios of the ingredients, yield ratios of the products and byproducts, and specific batch properties. By using batch determination together with MQC, you can perform active ingredient management in a process order.

Because production planning for process industries is designed for the chemical, pharmaceutical, and food and beverage industries, batches play a very important role in their business. A particular material may have one or several batches in stock available for consumption. When a process order is created, you may want the batch consumption to occur in a particular sequence and based on specific rules. Defining the strategy in the system where the system determines and offers the right batch to pick is called *batch determination*. Batches are used across the supply chain by various application components such as production planning, materials management, and sales and distribution. Each of these components have their own set of rules and setup required for batch

determination. [Figure 7.27](#) represents a typical process flow for MQC using batches.

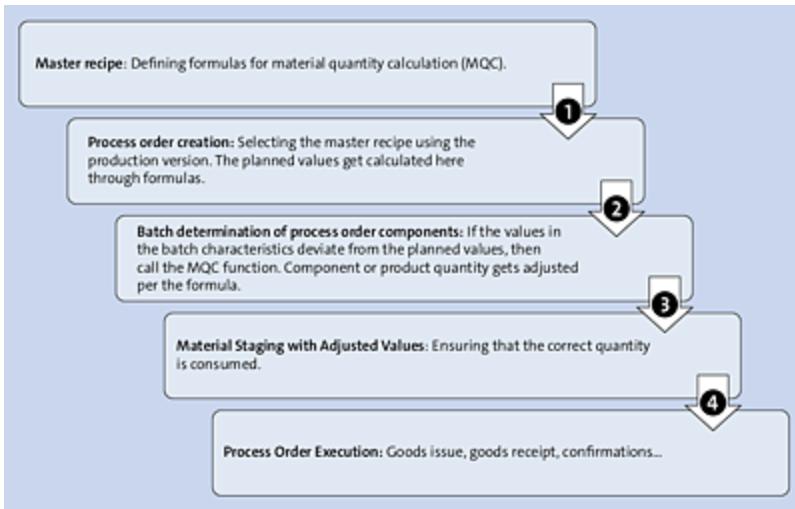


Figure 7.27 Batch Determination and Material Quantity Calculation

In MQC, you define the formulas in the master recipe to calculate the material quantities to be produced during the production process, taking into account active ingredients, yield ratios, and specific batch characteristics values. You can also define formulas for calculating phase quantities in the material quantity. The following prerequisites must be fulfilled for MQC to function:

- A production version must have been defined for the master recipe with a formula.
- The process order must be created with the corresponding production version

MQC is always performed whenever you use the production version to select a recipe and BOM and then carry out scheduling. This means whenever you create a process order manually, convert planned orders, or during product costing, but not when you carry out MRP without a detailed plan.

In the process order, MQC determines the order-specific quantities. However, when the batches are determined, these values are recalculated, forming the basis for reservations scheduling, capacity requirements planning, and costing.

Batch Determination Configuration and Setup

A certain set of configuration and data setup settings must be in place for batch determination to work seamlessly, as covered in the following list:

1. Create the condition table

Condition tables are a combination of keys/fields that form the basis of the batch search strategy, as shown in [Figure 7.28](#).

When creating your condition table, using an SAP number 501 and onwards is recommended. Number area 30–39 is reserved for manufacturing. Standard condition tables available in the system are **030 Order Type/Plant/Component** and **031 Order Type/Plant/Material/Component**, which can be accessed by following the path **IMG • Logistic General • Batch Management • Batch Determination and Check • Condition tables • Define Process Order Condition Tables**.

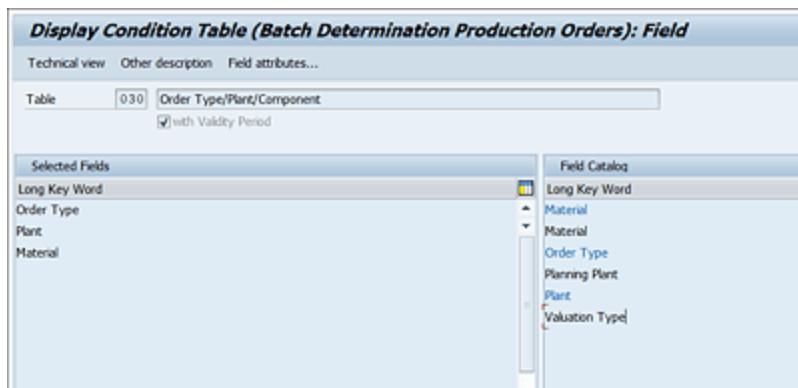


Figure 7.28 Define Condition Table

2. Define access sequence

You define the access sequence that the system uses to find a search strategy using a condition table. [Figure 7.29](#) shows the access sequence assigned to the condition table, which also has fields for selection. The menu path is **IMG • Logistics-General • Batch Management • Batch Determination and Batch Check • Access Sequence • Define Process Order Access Sequence.**

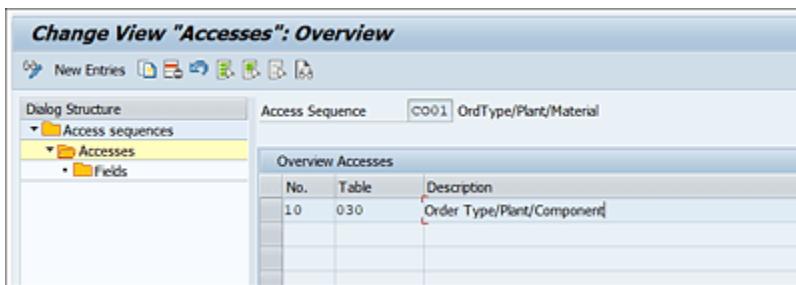


Figure 7.29 Define Access Sequence

3. Define strategy type

The criteria to be used during the batch determination process is defined here. For example, the batch strategy can be defined for various parameters, such as movement type, plant, and storage location, according to the client's requirement. [Figure 7.30](#) shows the strategy for the standard condition type **CO01**. The menu path is **IMG • Logistics-General • Batch Management •**

Batch Determination and Batch Check • Strategy Types • Define Process Order Strategy Type.

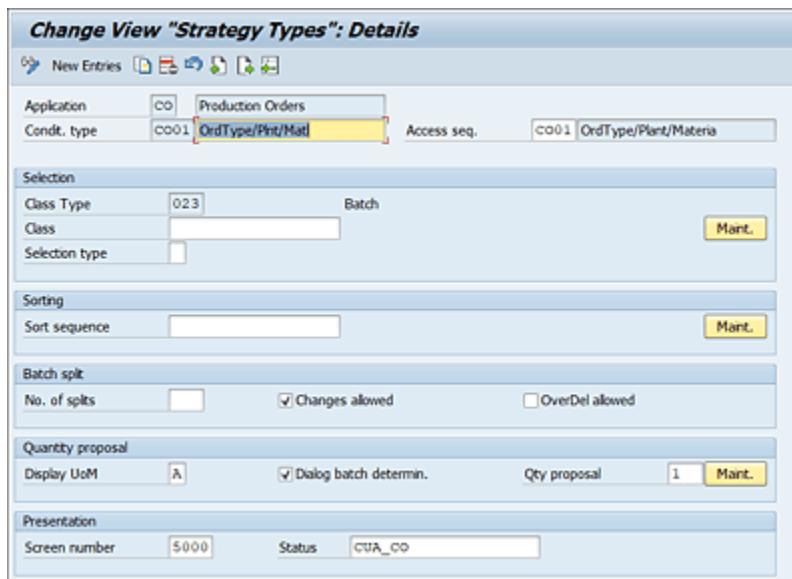


Figure 7.30 Define Strategy Type

4. Batch search procedure

A batch search procedure comprises all strategy types that can be used for a particular plant/order type combination.

[Figure 7.31](#) shows the assignment of condition types to a batch search procedure.

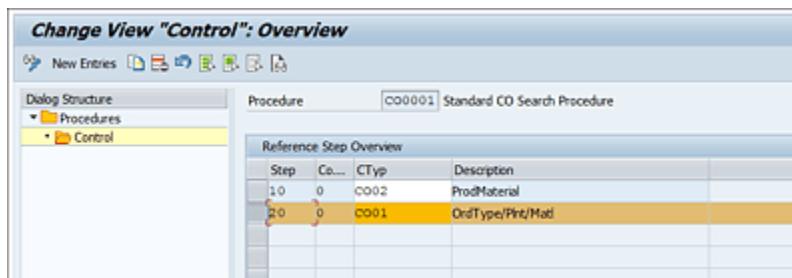


Figure 7.31 Batch Search Procedure

The menu path is **IMG • Logistics-General • Batch Management • Batch Determination and Batch Check • Batch Search Procedure Definition • Define Process Order Search Procedure.**

5. Batch search procedure assignment and activation

In this step, a search procedure is assigned to a particular plant/order type combination, as shown in [Figure 7.32](#). The menu path is **IMG • Logistics-General • Batch Management • Batch Determination and Batch Check • Batch Search Procedure Allocation and Activate Check • Assign Search Procedure to Process Order and Activate Check**.

| Overview: Search Procs | | | |
|------------------------|---------------|----------------------|-------------------------------------|
| Plant | Type | Name | Search Proc. |
| 222X YBM2 | Process Order | BP: Search procedure | YB0001 |
| | | | <input checked="" type="checkbox"/> |

Figure 7.32 Batch Search Assignment and Activation

6. Batch search strategy for process order (Transaction COB1)

If you want to execute the batch determination for components in the component overview of the process order, then you need to create a batch search strategy in Transaction COB1.

Depending on your strategy type, you assign the parameters in the record. For example, you choose the **Plant** and **Order Type** the record is created for, as shown in [Figure 7.33](#). You can assign additional parameters such as sort sequence, selection

criteria, and number of batch splits to full requirement quantity from additional batches in case there's a shortage.

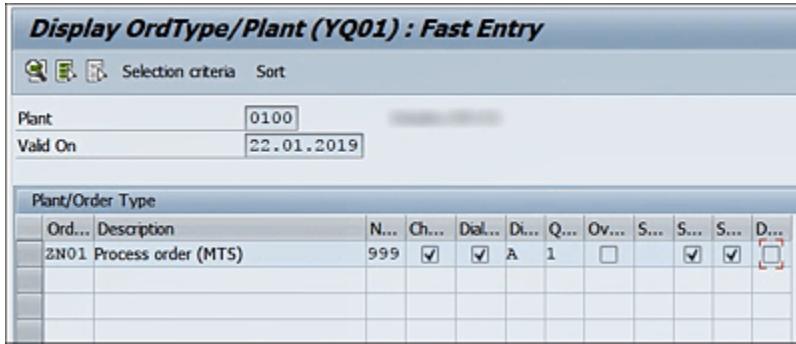


Figure 7.33 Batch Search Strategy

7. Selection criteria (Transaction CL01)

A batch search class with characteristics condition is created. This search class is assigned to the batch search strategy (see [Figure 7.34](#)). The characteristics in these classes are used to find batch in stock during the batch determination process.

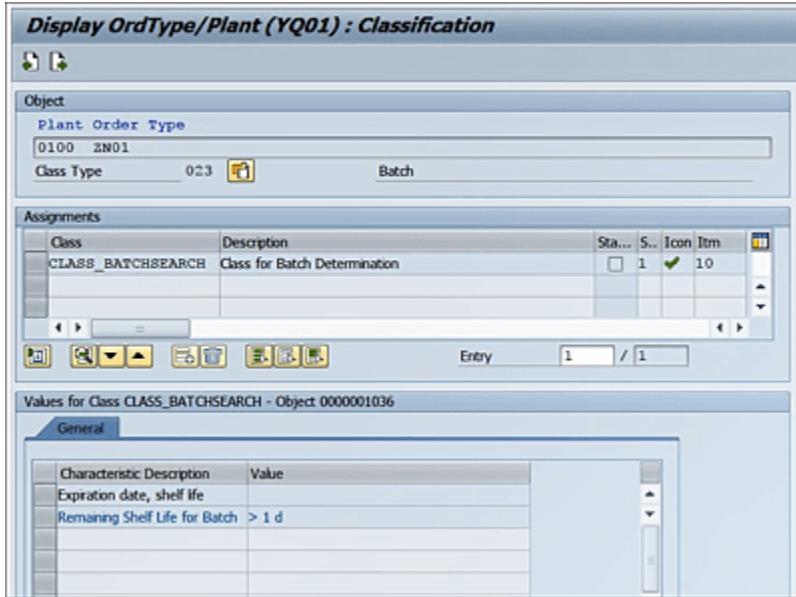


Figure 7.34 Selection Criteria

8. Sort rule (Transaction CU70)

In sort rules, you specify the characteristics according to which

the system sorts the batches it finds. You can specify an ascending (**Asc**) or descending (**De**) sort sequence for each field, as shown in [Figure 7.35](#). The sort rule characteristics must be user-defined characteristics or standard SAP-provided characteristics that you've used for the classification of the batch.

| Key | | |
|---|--|---|
| Plant 0100 | Order Type ZH01 | Description Process order (MTS) |
| Validity | | |
| Valid period To | 22.01.2019 31.12.9999 | <input type="checkbox"/> Deletion Indicator |
| Sort rule SLED80RT Sort using Shelf Life | | |
| Sort sequence | | |
| Characteristic LOBM_VFDAT | Description Expiration date, shelf life | <input checked="" type="checkbox"/> Asc <input type="checkbox"/> De |

Figure 7.35 Sort Rule

Material Staging and Withdrawal

After the order is released, the necessary components must be issued so that the production-related activities can begin.

The SAP system has various procedures for controlling material staging:

- Stocks managed through inventory management
- Replenishment using kanban
- Storage location stocks managed using warehouse management

The warehouse-managed storage location has three options:

- Pick list items are provided for the process order in exactly the same quantity as the requirements quantity. These parts can be

provided for the process order at a physical storage location or dynamic storage location (process order). Here, you can create transfer requirements manually or automatically when you release the order.

- Crate parts are requested manually when a container is almost empty.
- Release order parts are requested manually. The required quantity is calculated using the target quantities of the components in the selected released orders, causing the stock situation to be considered in the production and replenishment storage types.

When you create a process order, a reservation for the material components is required for the order. Each material component of the order is given an item number within the reservation. The reservation contains the details of the item such as material number, required quantity, UoM, storage location, batch, and so on. Goods issue posting with reference to this reservation falls under planned goods issue and other withdrawals are called unplanned goods issue.

You can use the backflushing functionality to post good issue automatically. You can use process messages to trigger goods issue postings from a PCS or the PI sheet. The process message of category PI_CONS can be used here because the message destination is the goods issue posting function module.

Confirmations

To record the task being performed for a process order, confirmations are posted that document the details related to a confirmation record, which can be viewed later and also be used to monitor process progress.

In process industries, confirmations are recorded for the phases and secondary resources. Because costing, scheduling, and capacity requirements planning are only based on the phase data and secondary resource data, operations aren't confirmed.

You can use either SAP standard transactions or process messages from within the PI sheet or a PCS to post confirmations.

If you enter a confirmation for a phase or a secondary resource, you can use any of the following options:

- To confirm durations and activities based on activity types defined in the master data, you enter a time ticket confirmation (Transaction COR6N, as shown in [Figure 7.36](#)).
- To confirm a specific point in time (e.g., processing start or processing finish), you enter a time event confirmation. (Transaction CORZ). The formulas defined in the resources act as the basis for calculating the activity.
- To confirm the data of several phases and secondary resources belonging to different orders, you can use the collective confirmation function. The standard values of the phases/secondary resources are confirmed in accordance with the formulas assigned (Transaction CORR).

The screen layout for single screen confirmations can be managed using a confirmation profile, which is configured in Transaction OPK1.

[»] Note

Confirmation parameters are configured for each order type and plant, and they control parameters such as which entry screen is

offered by default, which data the system proposes during data entry, and how strictly you want checks to be carried out.

The screenshot shows the SAP interface for 'Enter Time Ticket for Process Order'. At the top, there are tabs for 'Goods Movements' and 'Actual Data'. Below the tabs, there are fields for 'Order' (highlighted in yellow), 'Material' (with a dropdown for 'Material Descr.'), 'Phase', 'Resource' (with a dropdown for 'Plant'), and 'Confirm.type' (set to 'Automatic final confirmation'). A checkbox for 'Clear open reservations' is checked. Below these settings, there are two tables. The first table is for 'Yield' and 'Scrap', showing values of 0.000 for both. The second table is for 'Activity', which is currently empty. The interface includes various buttons and status indicators.

Figure 7.36 Time Ticket Confirmation of a Process Order

The following list provides an overview of common confirmation tasks:

- **Goods movement linked with confirmations**

When you confirm an order or phase that has components assigned to it and the **Backflushing** indicator is active, the system automatically posts a goods issue for these components while posting confirmation. You can make settings for backflush in the following:

- Material master record (**MRP view**)
- Resource (**Basic Data screen**)
- Master recipe (**General Data screen for component assignment**)
- Process order (**General Data screen for the material component**)

- **Automatic goods receipt**

If the control key assigned to the phase specifies that an automatic goods receipt must be made, the system automatically posts the goods receipt of the header material into stock while posting confirmation. Automatic goods receipt can only be posted for one phase per order. You should therefore make sure that only one phase in the order (normally the last phase) has a control key that specifies automatic goods receipt.

- **Unplanned goods movements**

You can navigate to a material overview from the confirmation.

You can enter any number of unplanned material movements or change planned material movements on this material overview.

[»] Note

In production planning for process industries, you can use process messages from process controls to post material movements. If you use this function, don't trigger material postings from the confirmation.

- **Goods receipt**

After the material is produced, it needs to be posted to the warehouse, and this is recorded in the system in the form of goods receipts. When you post a goods receipt against a process order, the following activities are carried out:

- A material document is created capturing the details of the material, qty, batch, dates, and so on.
- An accounting document for cost is created describing the material movement from the accounting perspective.
- The system updates the material's stock quantities and value.

You can post goods receipt by using Transaction MIGO or automatic goods receipt while posting confirmations or by sending process messages from the PI sheet or a PCS.

The **Delivery Completed** indicator specifies whether an order isn't expecting any more planned goods receipts. The open quantity is zero.

Underdeliveries are permitted in the standard system. You can even define an underdelivery tolerance percentage (see [Figure 7.37](#)). A goods receipt quantity that is less than the order quantity minus the underdelivery tolerance is regarded as a partial delivery and is accepted by the system. If you manually post the goods receipt, the system issues a message to inform the user about the underdelivery. In this message, it also takes the underdelivery tolerance into account.



Figure 7.37 Underdelivery and Overdelivery Tolerance

Overdeliveries aren't allowed in the standard system. If you want to allow overdeliveries, you can define an overdelivery tolerance percentage. In addition, you can deactivate the overdelivery tolerance check and thus enable unrestricted overdeliveries.

7.5.3 Order Closing

When an order is completed from an execution perspective, it must be closed, that is, when no more confirmations and postings are expected. The closing processes begin with the order settlement where the cost incurred against the order must be settled against a cost object. After the settlement of the order is done, the order status

can be set to TECO. This means the order is now complete from a logistic perspective and is closed. Such orders are then archived from the database after a certain period is over. Thus, the overall order closing process is subdivided into the following three parts:

1. Order settlement

When the process order is confirmed and delivered, the actual cost incurred is captured and settled to a cost object. The cost object can be the material that is produced or the sales order against which the process order was created. When you settle the costs for the process order to a material account, the order is credited each time material is delivered to stock, and the material stock account is debited accordingly. If the costs for the process order are settled to a sales order, the order is credited automatically at the time of settlement, and the cost objects are debited accordingly. The debit posting remains in the order and can be displayed for reporting purposes later. This activity is managed by controlling and is mostly done monthly either based on the order or by setting up a batch job.

[»] Note

The order must be in **Delivered (DLV)** status for settlement to occur.

A settlement rule gets assigned to the process order during order creation. This assignment follows the rules defined in the Customizing (order-type-dependent parameters). The settlement rule has distribution rules for the process order. The distribution rule consists of a settlement receiver, a settlement share, and types. Through the settlement receiver, the system determines

which cost object is used for settling the actual costs of the process order.

By settlement the share, you define the percentage/equivalence number used to distribute the costs to individual settlement receivers. The settlement type is used to determine whether all costs incurred by the order are settled (total settlement) or whether periodic settlement is to be carried out for the order. For the make-to-order scenario, when production is done with reference to a sales order, the sales order is automatically defined as the settlement receiver.

2. Technical completion of order

The technical completion (TECO) function is performed on orders when no further actions are expected from the logistics point of view. The following actions are carried out when the order is technically completed:

- The order is no longer relevant to planning (MRP).
- The reservations are deleted, and the capacity requirements are reduced.
- Any purchase requisitions that may exist for externally processed operations or nonstock components are deleted.
- The system **Technically Completed (TECO)** status is set for the order and the operations.

[»] Note

If an order is technically completed, you can't make any changes to the order. To make changes, the technical completion of the order must be revoked. However, the system

will still allow you to post material consumption and confirmation in **TECO** status.

3. Archiving and deleting process orders

Process orders for which processing is over can be archived and deleted after their defined period in the Customizing (**Residence Time 1 and 2** in the Customizing of **Define Order Types**) is over. Archiving object PR_ORDER is used to perform this activity. The archiving activity comprises the following steps:

- Activating the deletion flag in the order
- Activating the deletion indicator in the order
- Executing an archiving run
- Executing a deletion run

After the duration in **Residence Time 1** has elapsed, the deletion indicator is activated for those orders with a deletion flag by running a background job. After the **Residence Time 2** is over, the orders are archived and deleted from the database

7.6 Goods Manufacturing Practices

The Food and Drug Administration (FDA) has laid down the guidelines for Goods Manufacturing Practices (GMP). The regulations contain the minimum requirements for the methods, facilities, and controls used in manufacturing, processing, and packaging of food and drug products. The regulations make sure that a product is safe for use. These international standards are common in many areas of process industries. They must be considered in the processes of the pharmaceutical industry.

You can specify that a process order can only be created if an approved master recipe exists. The approval procedure is controlled via ECM. You can also individually approve a process order. You use the material identification function to check whether the material that was picked for the process order is completely available at the production line and will be used in the correct sequence.

You can exchange information about the product quality and analysis values between the production plant and the laboratory or the quality assurance system by using quality management in SAP S/4HANA. You can use the inspection results for batch specification by automatically copying them to the characteristics of the batch produced. You use the material reconciliation function to analyze and verify required quantities and yield at the end of the production process. With regard to product liability, the batch records all quality-relevant planned and actual data on the production of a batch, which can be approved by a single or group of digital signatures and can't be forged.

You can activate the digital signature function to execute certain business operations in the SAP S/4HANA system. A *digital signature*

is equivalent to a hand signature when using digital records. This ensures that the security guidelines prescribed in the GMP are met. Only users with certain authorization access can perform this action

The digital signature is implemented for the business areas listed in Table 7.1.

| Area | Signature Object Type |
|--|---|
| Engineering change management (ECM) | Status changes of change orders |
| | Status changes of object management records |
| SAP Document Management service | Document management: status change |
| Production planning for process industries | PI sheet: complete process step |
| | PI sheet: accept invalid input values |
| | Batch record: approval |
| | Standard XSteps |
| Quality management | Inspection lot: results recording |
| | Inspection lot: usage decision |
| | Physical-sample drawing |

| Area | Signature Object Type |
|--|-----------------------|
| Notifications (e.g., certificate of analysis, quality management, plant maintenance) | Notification |

Table 7.1 Application Areas of Digital Signature

You can use Transaction DSLOG to display and analyze the logs that were recorded in the past using the digital signature process, as shown in [Figure 7.38](#). You can also view archived logs, which document the detailed steps of a signature process. Logs for all successful, canceled, and deleted signatures can be viewed.

You can also analyze the signature log according to application, signature object, signature time, and user ID of the signatory. It contains the result of the signature steps with the corresponding messages and all data that is transferred to the signed document with successful signatures.

For analyzing purposes, you can use the following log classes:

- **User locked**
- **Wrong password, missing SSF info**
- **Signature process canceled**
- **Signature executed successfully, signature process completed successfully**

- System error

Digital Signature Logs

Applicat. [dropdown menu]
Signature Obj. [dropdown menu]
Signer [dropdown menu]

Signature Time
From (Date/Time) 22.09.2021 00:00:00
To (Date/Time) 22.09.2021 23:59:59

Sort Display According to
 Signature Object
 Signature Time

Log Class
 User locked
 Wrong password, missing SSF info
 Signature process canceled
 Signature executed successfully, signature process completed successfully
 System Error

Batch Record PI Sheet Inspection Lot Object Management Record Engineering Change M... [button icons]

| | | | | |
|----------|-----------------|----|-----------------|---------------|
| Material | [dropdown menu] | to | [dropdown menu] | [button icon] |
| Batch | [dropdown menu] | to | [dropdown menu] | [button icon] |
| Plant | [dropdown menu] | to | [dropdown menu] | [button icon] |

Figure 7.38 Digital Signature Logs

7.7 Additional and Advanced Functions

Process orders are an integral part of process manufacturing. They support various other functions and reports that can be used per business needs. The following list describes some of those process-order-related functions:

- **Co-products**

Co-products are manufactured along with the main product in the same order. They appear as a separate line item in an order and hence are costed. A co-product shares the overall cost with the main product.

- **Variant configuration**

When a particular manufacturer offers variants of its products, and the product structure is complex, variant configuration is used. The components are determined using various conditions, preconditions, and dependencies defined in the system.

- **Combined order**

There are certain industry types where some parts of their manufacturing process use similar operations for manufacturing different products. Such identical operations of orders of the same material can be combined into a single consolidated order known as combined order.

- **WIP batches**

A WIP batch is created in reference to process orders. They basically allow you to save the batch-related information when the product is in progress and establish a link between an input and an output batch of the order.

- **Batch derivation**

Batch derivation enables you to transfer/display batch master data and classification data of the component batches to produced batches. Component batches may be treated as sender data, and produced batches may be treated as receiver data.

- **External processing**

You use external processing when a particular process step is outsourced to an external vendor. In this process, the material is supplied to a vendor for a particular operation to be performed; when the operation is complete, the material is received back from the vendor to the supplying plant.

The following list describes some of those process-order-related reports:

- **Order Information report**

This report is widely used across shop floor control and is capable of showing data related to plan orders and process orders. You can view all the orders with various statuses and also filter out records based on several parameters such as material, plant, order type, statutes, and so on. The report can be accessed via Transaction COOISPI.

- **Order Progress report**

The order progress report shows you a quick overview of the status of production and procurement that has been ordered by a customer. You can see the list of documents, MRP-related elements, stock situations, and deliveries that exist for products and their components that have been ordered by a customer. This report can be accessed via Transaction CO46.

- **Missing parts information system**

This is a standard reporting tool that can be used to analyze the material shortage for orders. These are mostly used by planners

to manage shortages and take appropriate action accordingly.

This report can be accessed via Transaction CO24.

- **Batch Information cockpit**

Batch traceability and where-used list are of prime importance for process industries. This report offers a wide range of reporting and analytical functions. You can perform top-down and bottom-up traceability analysis, display batch stocks and batch masters, and even change batch-related information. This report can be accessed via Transaction BMBC.

7.8 Important Terminology

In this chapter, the following terminology was used:

- **Alternative BOM**

This unique number is used to define or identify one bill of material in a BOM group. One product can have several alternatives for different processes and lot sizes.

- **Activity type**

This object in the controlling area classifies the activities performed in a cost center, which then gets assigned to a resource to capture costs. For example, machine time and setup time can be activities for a finished product.

- **Backflush**

This refers to the automatic issuing of components for an order whenever a confirmation is posted.

- **Capacity calculation**

When a process order is created, it generates a capacity requirement that specifies how much capacity is required at a given time. These requirements can be of different categories based on the capacity category. Capacity planning is used then to evaluate the available capacity and capacity requirements, and then perform capacity leveling.

- **Inspection specification**

This is a list of parameters against which the quality of a product is measured or inspection is performed. These specifications can either be qualitative (e.g., color, texture) or quantitative (e.g., length, weight, volume).

- **Lot sizes**

Whenever you produce or procure a certain quantity of a product, the lot size is used as a criterion for the selection of alternative BOMs and a recipe.

- **Production resources tool (PRT)**

These are assets or resources required during the manufacturing process that don't get consumed. For example, jigs and fixtures, measuring instruments, and engineering drawings are used during the manufacturing process but don't get consumed.

- **Quality inspection**

These inspections ensure that the product meets the desired characteristics and acceptance criteria. The quality inspection is integrated into process orders and can be triggered when the product is in the WIP stage; inspection of finished goods can be triggered when the goods receipt of the product is posted.

- **Resource network**

You define resources as processing units, and these units are arranged in a specific sequence. To specify this sequence, you define predecessor and successor relationships between resources in the form of resource networks.

- **Scheduling type**

The schedule start date and end date of the order is determined using the scheduling type. A process order can be forward scheduled, backward scheduled, current date scheduled, or based only on capacity requirements. The default scheduling type can be set in the Customizing of scheduling parameters for orders.

- **Status profile**

You can define user-defined statuses in the status profile and assign them in the order type Customizing. It can be used to perform certain functions such as allowing or forbidding certain

transactions if a status is active. You can put your user statuses in a sequence by assigning a status number to each user status.

7.9 Practice Questions

These questions will help you evaluate yourself for the topics covered in this chapter. They are similar in pattern to those on the certification examination. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers to receive credit for the question. On the day of your exam, before your test begins, the latest guidelines applicable to you will be provided so that you can go through and understand them.

1. Your client uses process orders for the production of liquid chemicals. What can you define to ensure that the flow happens only in physically connected tanks?
 - A. Operation network
 - B. Work center hierarchy
 - C. Resource network
 - D. Setup matrix
2. Which of the following functionalities are included in SAP S/4HANA to support the GMP compliant production process? (There are three correct answers.)
 - A. Use of GMP flag in relevant master data applications
 - B. Use of digital signature function to check and run business processes
 - C. Documentation of quality data with quality management
 - D. Predefined GMP-compliant process order types to meet audit requirements
 - E. Recipe approval with engineering change management

3. The method in which a process order is credited or debited depends on the variant of cost object controlling. What basis can be used to carry this? (There are two correct answers.)
- A.** Milestone-related basis
 - B.** Cost-related basis
 - C.** Product-related basis
 - D.** Order-related basis
4. Confirmations for process order are recorded at which level?
- A.** Operation level
 - B.** Phase level
 - C.** Both A and B
 - D.** None of the above
5. You can trigger which of the following business functions using the production scheduling profile? (There are two correct answers.)
- A.** Confirm available partial quantity
 - B.** Generate control recipe at release
 - C.** Activate back flushing
 - D.** Assign a default inspection type
6. Which of the following options are available for process management in the master recipe profile?
- A. Process Instructions**
 - B. XSteps**
 - C. XSteps (Optional)**
 - D. All the above**
7. When a user creates a process order, the system requires the order to be approved before allowing the user to release it. Where can you control this setting?

- A.** Order-type-dependent parameter
 - B.** Control key
 - C.** Confirmation profile
 - D.** Recipe profile
8. When you define the process instruction category, you have to assign a process instruction type to enable the system to process the data accordingly. What are the different process instruction types available? (There are three correct answers.)
- A.** Universal
 - B.** Dynamic function calls
 - C.** Calculations
 - D.** Process groups
9. Which of these is a valid control recipe destination?
- A.** Transfer to ABAP list-based PI sheet
 - B.** Download to external system, initiated by SAP process management
 - C.** Download to external system, initiated by external process control
 - D.** Transfer to browser-based PI sheet
 - E.** All of the above
10. Which of the following actions are carried out when the process order is technically completed? (There are two correct answers.)
- A.** The reservations are deleted.
 - B.** The capacity requirements are deleted.
 - C.** The order becomes relevant for MRP.
 - D.** All of the above

7.10 Practice Question Answers and Explanations

1. Correct answer: **B**

When you have several processing units defined as resources, and they are arranged and connected in a sequence using relationships, it forms a network. This describes a material flow in a plant and is called a resource network.

2. Correct answers: **B, C, and E**

Digital signatures help ensure that the security guidelines prescribed in the GMP are adhered to. It helps you control certain business processes from ECM, DMS, quality management, and production planning for process industries.

3. Correct answers: **C and D**

The cost is either posted to the header material or to a sales order in the case of the make-to-order scenario.

4. Correct answer: **B**

In the master recipe, activities for production duration and labor hours are assigned at the phase level. Therefore, the confirmation for a process order is posted at the phase level.

5. Correct answers: **A and B**

You can control **Confirm Partial Available Qty** and **Generate Control Recipe at Release** through the production scheduling profile, whereas the backflushing indicator is at the master data level, and the default inspection type (in process) is in the configuration for order-type-dependent parameters.

6. Correct answer: **D**

The configuration of the master recipe profile offers three options for process management: **Process Instructions**, **XSteps**, and **XSteps (Optional)**.

7. Correct answer: **A**

The **Approval Required** indicator under the configuration of order-type-dependent parameters enables this.

8. Correct answers: **A, B, and C**

There are eight different types of process instruction types, including universal, dynamic function call and calculations, process parameters, process data requests, process message subscription, inspection result requests, and sequence definition.

9. Correct answer: **E**

All the control recipe destinations listed are valid. SAP standard offers four destination types as follows:

- Type 1: Transfer to an ABAP list-based PI sheet.
- Type 2: Download to an external system, initiated by process management in the SAP system.
- Type 3: Download to an external system, initiated by the process control. The control recipe transfer to the external system is to be initiated by the external system.
- Type 4: Transfer to a browser-based PI sheet displayed in the HTML layout on the screen.

10. Correct answers: **A and B**

The following actions are carried out when the order is technically completed:

- The order isn't relevant to planning (MRP) anymore.
- The reservations are deleted, and the capacity requirements are reduced.
- Any purchase requisitions that may exist for externally processed operations or nonstock components are deleted.
- The system status **Technically Completed (TECO)** is set for the order and the operations.

7.11 Test Takeaway

You should now understand the production planning for process industries component in SAP S/4HANA and be able to describe the various master data information required in production planning for process industries and the significance of each. You now understand the additional functions, such as MQC, control recipes, process messages, and GMP adherence guidelines specified for process industries, so you should also be able to describe the necessary configuration and the functionalities they control in the overall production process. You should be able to describe the structure of process orders and be well versed in the execution steps related to that. In addition, you should be able to identify and describe the business processes based on industry and suggest possible approaches and solutions to their requirements.

7.12 Summary

This chapter has given you the overview of process industries, the various master data information required in the production process, the important configurations that control the processes, the entire execution cycle of process orders, GMP guidelines, and advanced functions. It's important that you understand the terms used in this chapter so that you can correlate them when you go through the other chapters of this book. The next chapter will cover capacity planning and its various functions in detail.

8 Capacity Planning

Techniques You'll Master

- Capacity planning
- Master data settings relevant for capacity planning
- Work center capacity
- Capacity leveling
- Parameters that influence dispatching
- Profiles that influence capacity evaluation and capacity leveling
- Navigation and management of SAP Fiori apps

In the previous chapters, we discussed the output of the MRP Live run as planned orders. Conversion of planned orders to production orders or process orders for discrete manufacturing or process manufacturing, respectively, or the planned orders are directly executed in repetitive manufacturing (REM). In the overall plan-to-manufacture cycle, a vital and an important step is capacity planning. It makes sense to check, evaluate, and level the production in the shop floor. For many organizations and production situations, the available out-of-the-box functionalities in SAP S/4HANA are sufficient, and basic capacity planning can be performed. In this

chapter, we'll cover capacity planning in detail and the new capacity planning relevant tools specifically developed for SAP S/4HANA.

Real-World Scenario

The aim of any organization is to maximize the production throughput and fully use the work center capacities. As a consultant or a planner, understanding the capabilities of out-of-the-box SAP S/4HANA capacity planning features and functionalities will give you the needed tools to create an optimal and feasible production plan. Capacity evaluation should be performed to check whether the work centers are overloaded or underloaded. Based on this clarity, leveling of work center capacities should be performed to achieve the production plans, which can be executed smoothly. Always ensure that the capacity load on the work centers doesn't exceed 100%. In fact, if you can, maintain the load between 80% and 100%, which is considered optimum. This provides the needed flexibility in the shop floor for receiving any rush orders or cushion in case any machine breakdowns occur.

8.1 Objectives of This Portion of the Test

The purpose of this portion of the certification exam is to test your knowledge in master data that is relevant for capacity planning. You'll understand the following concepts:

- Capacity evaluation
- Capacity leveling

- Features and functionalities of new SAP Fiori apps created for capacity planning

[»] Note

The capacity planning in SAP S/4HANA topic covers 8%–12% of the total exam, which will be around eight questions. You can expect questions related to the new SAP Fiori apps discussed in this chapter.

8.2 Capacity Process Overview

Capacity planning is available to ensure that all the available resources are used optimally. Even though capacity planning is available in sales and operations planning (S&OP), long-term planning (LTP), material requirements planning (MRP), predictive MRP (pMRP), discrete manufacturing, production supply area (PSA), and process industries, in this chapter, we'll focus mainly on the applications in discrete manufacturing.

MRP generates planned orders considering there is infinite capacity available at the work centers to produce the needed products, the system won't check whether there is sufficient capacity at the work centers or not. In fact, MRP isn't meant to check available capacity at work centers. That's the reason there is a step in the overall production planning cycle in capacity planning. These generated planned orders are to be sufficiently capacity evaluated, and work center overloads are leveled for smooth production. Capacity

planning can be applied to both planned orders and production orders in discrete manufacturing, as shown in [Figure 8.1](#).

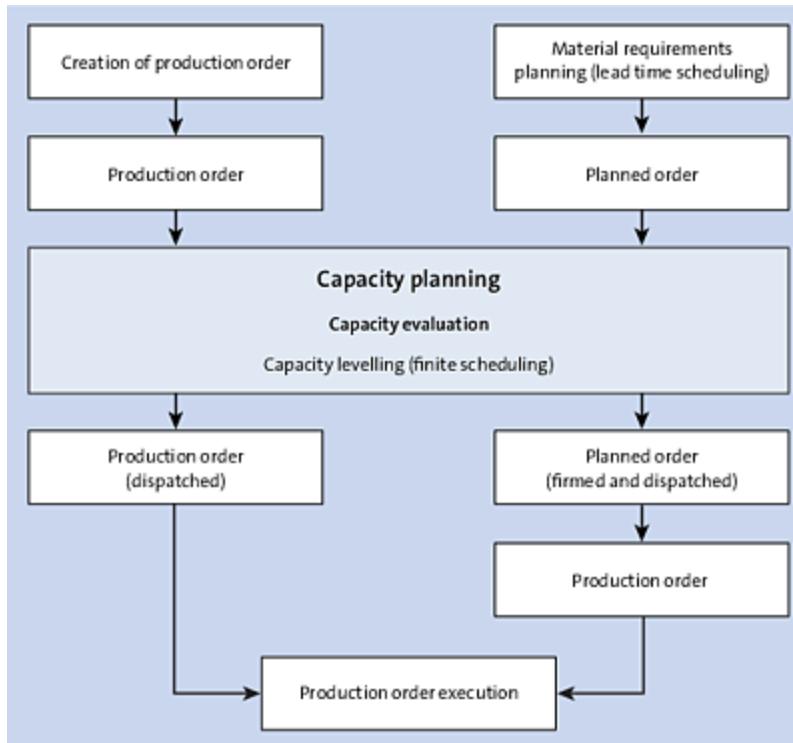


Figure 8.1 Overview of Capacity Planning in SAP S/4HANA

During MRP material requirements planning (MRP), the lead-time scheduled is carried out, and capacity requirements are determined. The determination of capacity requirements is based on the master data setup and the formulas used, which we'll discuss in the next section.

It's a general practice to evaluate the capacity where the system checks whether the available capacity is sufficient to perform the operations. If the available capacity isn't sufficient or the work centers are overloaded, then there is a finite scheduling function that reschedules the operations to a more suitable period where the available capacity is sufficient. In the capacity planning table (tabular or graphic), the **Dispatch** option is used after the operation is dispatched to identify the suitable dates, create the dispatching

sequence, consider the finite scheduling of the operation, and perform midpoint scheduling of the nondispatched operation of the order. After the operation is dispatched, the operation receives the system status **DISP** (dispatched). Planned orders will be set with the **Firming indicator** and **Capacity Dispatched** indicators. In both planned orders and production orders, there will be no automatic changes and no rescheduling with lead-time scheduling.

The load on the capacities will be reduced by the following: after the confirmations are posted, the order is set to technical completion (**TECO**) or deletion flag (**DLFL**), or the order is locked (**LKD**).

Capacity planning is available in the following areas:

- **Master production scheduling (MPS) and MRP runs**

During these runs, you can either use basic scheduling or lead-time scheduling. For the planned orders to be relevant for capacity planning, use the lead-time scheduling. Along with the lead-time scheduling, the capacity requirements will be generated and become a part of capacity planning.

- **Production order and process order scenarios**

Production orders and process orders will be almost the same. At a detailed planning level, the capacity requirements will be generated for both production and process orders. These capacity requirements are dispatched during capacity leveling. There are few limitations for process orders in comparison to production orders with reference to setup times.

- **PSA**

By using the planning table, you can carry out capacity planning and capacity leveling in PSA. Appropriate settings in the customization for scheduling parameters of planned orders are

maintained for capacity planning, which we'll revisit in the next sections.

- **Project systems**

In project view and network view, you can check and level capacities in project systems.

- **Plant maintenance and customer service**

With reference to maintenance orders, you can perform capacity leveling in plant maintenance. The same goes with customer service, where you can perform capacity planning for individual resources and technicians.

- **Sales and distribution**

With the planning strategies of the assemble-to-order (ATO) manufacturing scenarios, where sales orders are created (in sales and distribution), appropriate orders such as planned orders, production orders and so on will be created. You can navigate to the planning table directly in these automatically generated orders.

8.3 Master Data and Capacity Planning Settings

As discussed in [Chapter 2](#), the important master data objects relevant for capacity planning are as follows:

- **Work center capacities**

Most important for capacity planning is the data and formulas maintained in the work center **Capacities** tab page and the capacity header data. In the work center **Capacities** tab shown in [Figure 8.2](#), the machine capacity or personnel capacity categories are maintained. The capacity requirements are determined based on the operations processed at the work center. Operation times and capacity requirements both use the same standard values for the formulas.

The screenshot shows the SAP interface for 'Change Work Center: Capacity Overview'. At the top, there are tabs for 'Basic Data', 'Default Values', 'Capacities' (which is selected), 'Scheduling', 'Costing', 'Technology', and 'Groups'. Below the tabs, there's a section titled 'Overview' with a table. The table has two columns: 'Capacity category' and 'Machine'. The 'Capacity category' column contains fields for 'Pooled capacity' (key 001), 'Setup Formula' (key SAP005), 'Processing Formula' (key SAP006), 'Teardown Formula' (key), 'Other Formula' (key), 'Distribution' (key SAP060), and 'Int. dist. key' (key). The 'Machine' column contains fields for 'Vorschlagkapazität' (key) and 'Control Capacity Reduction' (three dropdown menus, all set to '0 Formula-Related'). At the bottom of the screen, there are several icons and buttons: a trash can, a copy icon, a 'Capacity' button, a 'Form.' button, a 'Formula' button, a 'Formula constnts' button, and an 'ActCapReqmnts' button.

Figure 8.2 Work Center: Capacities Tab

As detailed in [Chapter 2](#), the standard values (e.g., setup, machine, labor) are defined as parameters in Transaction OP7B. These standard values are assigned to the standard value key, which determines the standard values to be used or assigned in

the routing. The standard values key can be created with Transaction OP19.

The capacity requirement formulas use the same standard value parameters. The formulas contain standard value parameters and other parameters that represent the order values such as base quantity, operation quantity, and so on. The formulas can be created by using the Transaction OP21, as shown in [Figure 8.3](#).

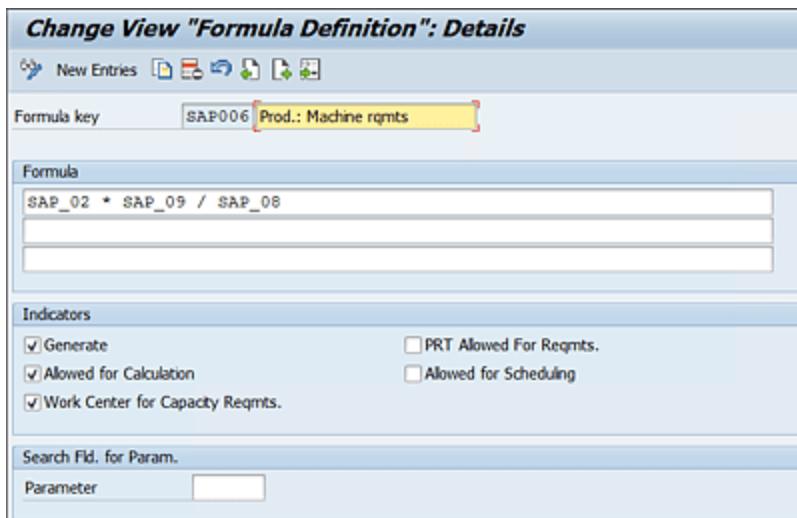


Figure 8.3 Formula for Calculating Capacity Requirements

As shown in [Figure 8.3](#), the standard formula for calculating capacity requirements is **SAP006**. The capacity requirements can be calculated as follows:

$$\text{Capacity requirement} = \text{Standard value} * \text{Operation quantity} / \text{Base quantity}$$

- **Work center capacity header**

The work center capacity category is assigned with capacity-specific details, as shown in [Figure 8.4](#). Each capacity header is assigned to a factory calendar. If a specific factory calendar isn't assigned, the system will take the factory calendar from the plant definition. For each capacity category, a daily standard available

capacity is defined. The standard available capacity comprises start time, end time, length of breaks, capacity usage, and number of individual capacities.

The formula for capacity (in base unit of measure) can be calculated as follows:

$$\text{Capacity} = \text{Operating time} * \text{No. of individual capacity} * \text{Capacity utilization} / 100$$

As shown in [Figure 8.4](#), the capacity available is 480 MIN.

[!] Warning

The **Relevant to Finite Scheduling** indicator should be checked if you want the system to consider the available capacity and load on the capacity during capacity evaluation.

Change Work Center Capacity: Header

| Intervals and Shifts | | Available Capacity Profile | | Reference Available Capacity | | Short Texts | |
|------------------------------------|-------------------------------------|----------------------------|-------------------------------------|------------------------------|--|-------------|--|
| Plant | 1710 | Plant 1 US | | | | | |
| Work center | ASSEMBLY | Assembly | | | | | |
| Capacity category | 001 | Machine Capacity | | | | | |
| General data | | | | | | | |
| Capacity Responsible | A | Planner Group | A | | | | |
| Pooled capacity | <input type="checkbox"/> | Grouping | | | | | |
| Available capacity | | | | | | | |
| Factory Calendar | US | USA | | | | | |
| Active Version | | | | | | | |
| Capacity Base Unit | MIN | Minute | | | | | |
| Standard available capacity | | | | | | | |
| Start Time | 07:00:00 | Capacity Utilization | 100 | | | | |
| End Time | 16:00:00 | No. Ind. Capacities | 1 | | | | |
| Length of breaks | 01:00:00 | Capacity | 480.00 | MIN | | | |
| Operating time | 8.00 | | | | | | |
| Planning details | | | | | | | |
| Relevant to Finite Scheduling | <input checked="" type="checkbox"/> | Overload | <input type="checkbox"/> % | | | | |
| Can be used by several operations | <input checked="" type="checkbox"/> | Long-term planning | <input checked="" type="checkbox"/> | | | | |

Figure 8.4 Work Center: Capacity Header

- **Distribution key**

The distribution key determines how the capacity requirement of an operation is distributed to different periods if the operation extends over several days. The distribution is a combination of distribution function and distribution strategy, as shown in [Figure 8.5](#).

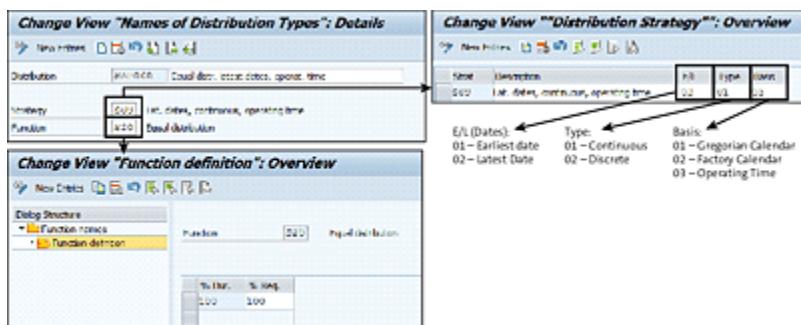


Figure 8.5 Distribution Key

The distribution function determines the percentage of capacity loaded after a certain percentage of an operation's duration. The **Equal distribution** option means continuous requirements distribution equally over the duration of the operation.

The distribution strategy defines which operation dates are used based on continuous or discrete distribution, which is carried out based on the Gregorian calendar, factory calendar, or operation times.

Routing data is relevant for capacity planning in the following ways:

- Routing operation values are base quantity and operation quantity.
- The standard values—setup time, machine time, operation time—are copied into the routing operation from the work center.

For capacity planning, you select a suitable **Control key** for which the **Det. Cap. Reqmts** (determine capacity requirements) indicator is set, as shown in [Figure 8.6](#).

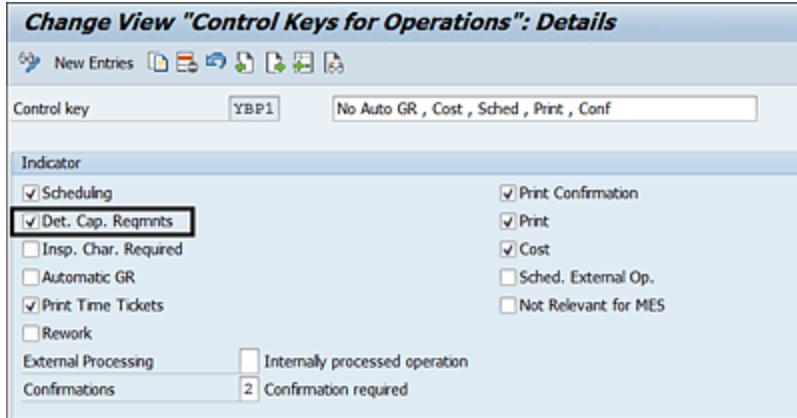


Figure 8.6 Operation Control Key: Determine Capacity Requirements indicator

8.4 Capacity Evaluation

Capacity evaluation is performed to get a clear overview of the current capacity situation of the work centers. The work centers may be overloaded or underloaded, and after the evaluation, only the next steps of smoothing the load by leveling can be performed. SAP provides many transactions for capacity evaluations. The conventional SAP GUI transactions available in SAP ERP are still available in SAP S/4HANA. Many new SAP Fiori apps are also added for capacity evaluation and leveling.

The available transactions for capacity evaluation are listed here:

- Transaction CM01: Work Center Load (Standard Overview)
- Transaction CM02: Detailed Capacity List
- Transaction CM03: Pool Capacity/Operations
 - All the released production orders in the period are displayed.
- Transaction CM04: Backlog
 - Only the past orders are displayed where the operation's start date is in the past.
- Transaction CM05: Overload
 - In the overload report, only the overload periods are shown. The options profile is preset with a minimum 101% load.
- Transaction CM07: Variable View
 - You must select the appropriate overall profile upon entry.

In the following transactions, you can switch from the standard overview of the detailed capacity list to the variable overview:

- Transaction CM50: Extended Evaluation – Work Center View
- Transaction CM51: Extended Evaluation – Individual Order view
- Transaction CM52 – Extended Evaluation – Order View

In the next sections, we'll examine some of the most commonly used reports as well as the Manage Work Center Capacity app. The other SAP Fiori app available for capacity evaluation is Monitor Work Center Schedules app, which will be discussed later in the “Capacity Leveling” section.

[»] Note

The Capacity Planning transactions (CM*) will be replaced by the SAP Fiori apps. These transactions are still available in SAP S/4HANA, but they won't be considered for future development or enhancement.

8.4.1 Work Center Load (Standard Overview)

As shown in [Figure 8.7](#), the selection is at the work center level for a plant. The output is the capacity load of the work center for each calendar week. Here you can see that requirements, available capacity, capacity load, and remaining available capacity are shown. For **Week 44**, the work center is overloaded with a 102% capacity. You must make sure that for a given week, the work center is never overloaded.

You can navigate to the detailed capacity overview from the standard overview, as shown in [Figure 8.8](#). This view is the same when you access Transaction CM02. You can change the settings for evaluation by navigating in either reports by selecting **Settings** •

General. In the settings, you can change the evaluation period; the periods can be selected as days, weeks, or months (the default is weeks); and so on. Cumulation, hierarchy, and available capacity version can be selected appropriately. The available capacity versions are created in the work center capacity header.

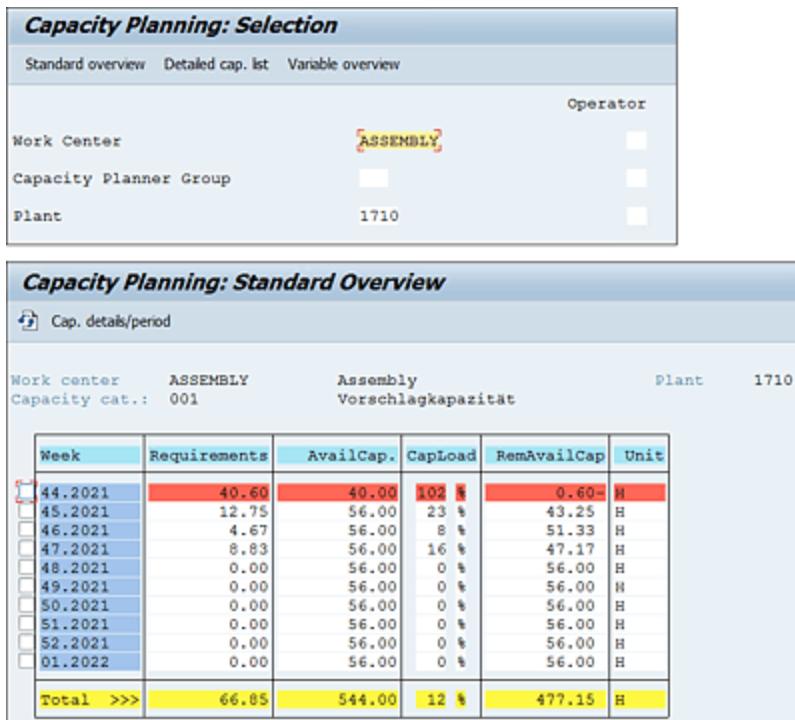


Figure 8.7 Transaction CM01: Work Center Load Standard Overview

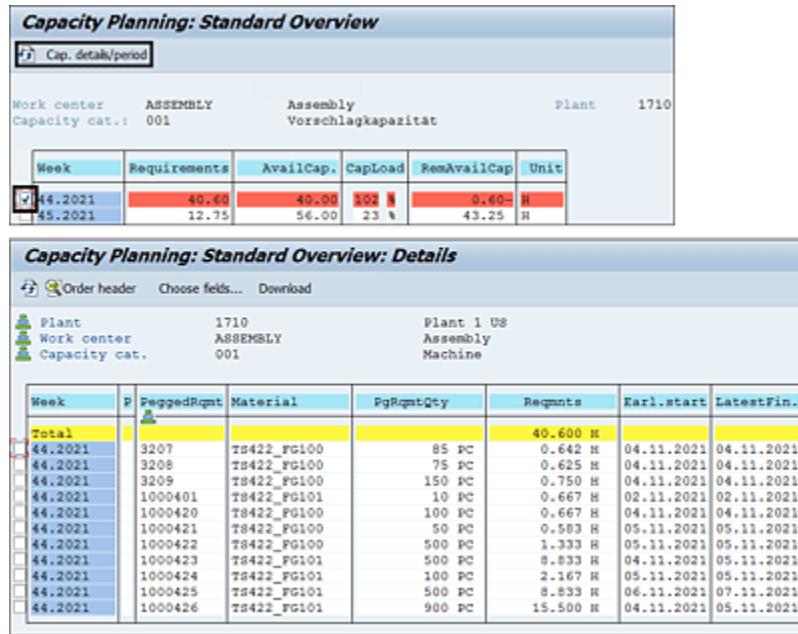


Figure 8.8 Transaction CM01: Work Center Load Detailed Capacity Overview

All the capacity evaluation reports are assigned with a default overall capacity profile. In the overall profile, other profiles such as selection profile, option profile, list profile, and graphic profile are assigned. The overall output of these reports is dependent on these profiles. For the work center load report, the overall profile **SAPX911** is assigned, as shown in [Figure 8.9](#). The overall profile can be created with Transaction OPA6.

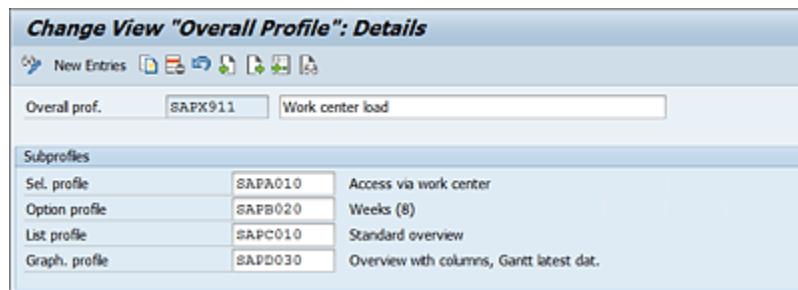


Figure 8.9 Work Center Capacity Evaluation: Overall Profile

There are other kinds of evaluations as well:

- **Variable evaluation**

With variable evaluation, you have the flexibility of selecting the appropriate overall profile. Transaction CM07 can be used for variable evaluation of work centers. The variable evaluation is similar to the standard evaluation performed with Transaction CM01, but shows only those requirements that affect the basic load (capacity requirements check, dispatching in the planning board, etc.)

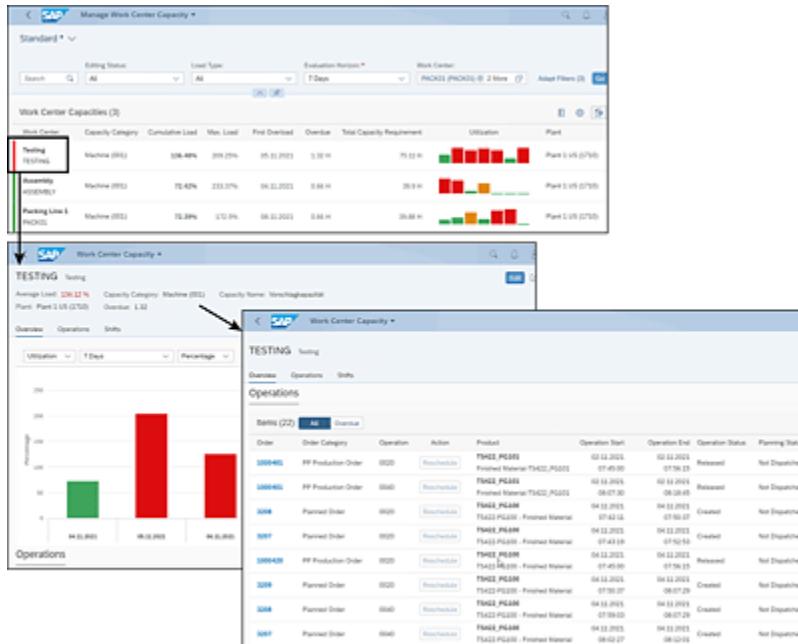
- **Extended evaluation**

The extended evaluation reports, for example, with Transaction CM50, show the standard evaluation of work centers. One limitation is that it's not possible to change the profile settings interactively in the report while displaying the data.

8.4.2 Manage Work Center Capacity App

One of the SAP Fiori apps for capacity evaluation is the Manage Work Center Capacity app. The features available in this app are like the standard SAP GUI transactions (CM*). With this app, it's possible to evaluate the capacity situation of a work center. The evaluation can be performed at a shift/day/week level. Work-center-related key performance indicators (KPIs) such as maximum load, first critical load, and overload situations can be monitored. If required, operation start and end dates can be rescheduled, as well as the start and end time of shifts. You can visualize the app as shown in [Figure 8.10](#). You need to have the production planner role assigned to access

this app, and you need the production supervisor role to navigate to the other apps.



8.5 Capacity Leveling

The objective of capacity leveling is to make sure that the committed capacity of the work centers is used optimally, and the overloads or underloads on the work centers are appropriately leveled. The main function of capacity leveling is the dispatching of operations such that a feasible production plan is created. Dispatching of operation can be performed from the tabular planning table or graphic planning table.

The following steps are involved in dispatching:

1. Determining the date in dispatching and rescheduling
2. Defining the dispatching sequence
3. Finite scheduling
4. Midpoint scheduling

After the operation is dispatched, the operation will receive a system status of dispatched (DISP).

8.5.1 Capacity Leveling Profiles

Like the overall profile in capacity evaluation, there is also an overall profile for capacity leveling, within which all the relevant profiles are maintained. Overall profile can be created with Transaction OPD0. Overall profile is always selected when performing capacity leveling,

and it specifies the overall parameters to be selected based on the subprofiles it contains, as shown in [Figure 8.11](#).

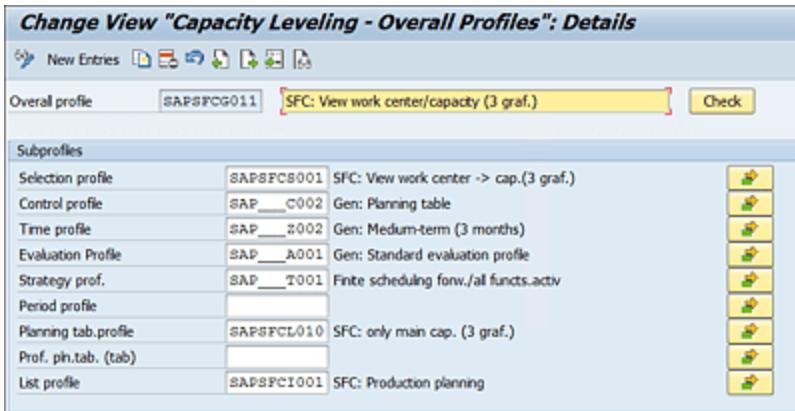


Figure 8.11 Capacity Leveling: Overall Profile

The strategy profile is the most important profile and contains many parameters, especially for dispatching and rescheduling. As shown in [Figure 8.12](#), the strategy profile selected is SAP_T001, which is part of the overall profile already shown in [Figure 8.11](#). The strategy profile contains parameters for scheduling, control of operations, dispatching sequence, dispatching functions, and period split. Strategy profile is maintained with Transaction OPDB. If you want to dispatch operations together based on specific rules, then **Dispatch. sequence** (see [Figure 8.12](#)) has an important role to play; for example, the simplest rule can be dispatched according to start dates and times.

Other profiles of importance are listed here:

- **Time profile**

This profile contains the settings for importing the time horizons for capacity planning. It contains the database read period, evaluation period, planning period, and dispatching of backlog.

- **Selection profile**

This profile defines which order categories (work orders, planned

orders, S&OP orders) and capacity requirements are considered for dispatch.

- **Evaluation profile**

This profile contains the distribution keys for the capacity requirements.

- **List profile**

This profile defines the presentation of the output lists.

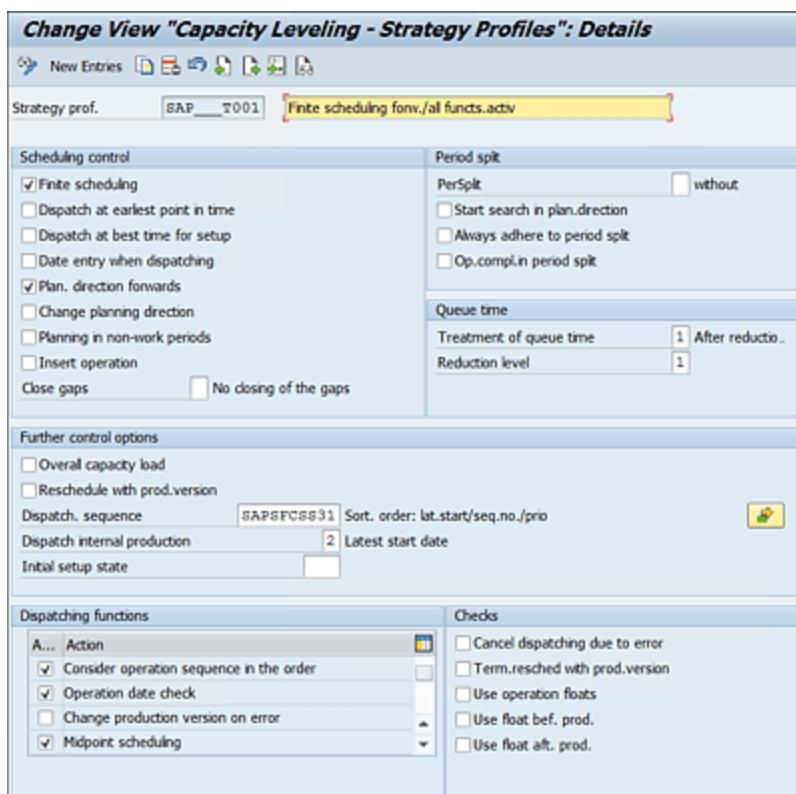


Figure 8.12 Capacity Leveling: Strategy Profile

8.5.2 Capacity Leveling with the Tabular Planning Table

Tabular capacity planning can be accessed with Transaction CM22. As shown in [Figure 8.13](#), the tabular planning table is divided into two sections. The upper resource section includes the work center capacities, capacity categories, periods which the operations can be

dispatched, and available capacity. The lower section contains total requirements, the material, the order number, the operation, and the work center, among others.

With the tabular planning table, you can perform the following functions:

- Dispatch an operation as follows:
 - Select the operation, and click **Dispatch**.
 - Select the operation and the period to dispatch an operation to a specific period.
 - Select the dispatch function manually to dispatch an operation to a specific date, time, and work center, as shown in [Figure 8.14](#).

- Deallocate requirements that were already dispatched by selecting the **Deallocate** button.

| Period Requirements per Resource | | | | | | | | | | |
|----------------------------------|------------|------------|------------|------------|------------|-----|--------|-----|-------|----|
| | Dispatch | Dispatch | Deallocate | Strategy | Order | | | | | |
| Work ctr Cap.ca - | 07.11.2021 | 08.11.2021 | 09.11.2021 | 10.11.2021 | 11.11.2021 | | | | | |
| ASSEMBLY 001 - | 60.0 | 88 | 480.0 | 0 | 480.0 | 0 | 480.0 | 0 | 330.0 | 31 |
| PACK01 001 - | 291.6 | 39 | 58.4- | 112 | 348.6- | 173 | 480.0 | 0 | 480.0 | 0 |
| TESTING 001 - | 400.0- | 183 | 103.0- | 121 | 303.8 | 37 | 524.8- | 209 | 201.0 | 58 |

| Requirements | | | | | | | | | | |
|--------------|-----|----------|------|---------|------|----------|-----|-----------|---------|-----------|
| Tot.req | Spl | Material | Prio | Order | Op. | Work ctr | Cap | Operation | qua | Rem.se... |
| 930.0 | 0 | TS422_FG | | 1000426 | 0020 | TESTING | 001 | | 900.000 | 30.0... |
| 530.0 | 0 | TS422_FG | | 1000423 | 0030 | PACK01 | 001 | | 500.000 | 30.0... |
| 530.0 | 0 | TS422_FG | | 1000425 | 0010 | ASSEMBLY | 001 | | 500.000 | 30.0... |
| 530.0 | 0 | TS422_FG | | 1000423 | 0040 | TESTING | 001 | | 500.000 | 30.0... |
| 930.0 | 0 | TS422_FG | | 1000426 | 0030 | PACK01 | 001 | | 900.000 | 30.0... |
| 530.0 | 0 | TS422_FG | | 1000425 | 0020 | TESTING | 001 | | 500.000 | 30.0... |
| 530.0 | 0 | TS422_FG | | 1000425 | 0030 | PACK01 | 001 | | 500.000 | 30.0... |
| 930.0 | 0 | TS422_FG | | 1000426 | 0040 | TESTING | 001 | | 900.000 | 30.0... |
| 530.0 | 0 | TS422_FG | | 1000425 | 0040 | TESTING | 001 | | 500.000 | 30.0... |
| 660.0 | 0 | TS422_FG | | 3201 | 0010 | ASSEMBLY | 001 | | 630.000 | 30.0... |
| 660.0 | 0 | TS422_FG | | 3201 | 0020 | TESTING | 001 | | 630.000 | 30.0... |
| 105.0 | 0 | TS422_FG | | 3204 | 0010 | ASSEMBLY | 001 | | 750.000 | 30.0... |
| 660.0 | 0 | TS422_FG | | 3201 | 0030 | PACK01 | 001 | | 630.000 | 30.0... |
| 105.0 | 0 | TS422_FG | | 3204 | 0020 | TESTING | 001 | | 750.000 | 30.0... |
| 105.0 | 0 | TS422_FG | | 3204 | 0030 | PACK01 | 001 | | 750.000 | 30.0... |

Figure 8.13 Tabular Capacity Planning Table



Figure 8.14 Manual Dispatch in the Tabular Capacity Planning Table

[»] Note

By selecting **Settings • Requirements Filter**, you can display dispatched requirements in the tabular planning table.

The calculation of free capacity in the tabular planning table is determined by the settings maintained in the profile for capacity planning table (tabular form). There are two options available:

- *Free capacity = Available capacity – Capacity requirements due to dispatched operations*
 - *Free capacity = Available capacity – Capacity requirements due to dispatched operations – Capacity requirements due to operations not yet dispatched (pool)*

8.5.3 Capacity Leveling with the Graphical Planning Table

The graphical planning table, as shown in [Figure 8.15](#), comprises work centers and operations dispatched in the upper pane, and nondispatched operations as order/operation pools in the bottom pane. You can access the graphical planning table with Transaction CM21. The default overall profile selected is **SAPSFCG001**.

Figure 8.15 Graphical Capacity Planning Table

You can dispatch the operations by selecting them in the pooled area. You can also select more than one operation at a time and click the **Dispatch** button. It's also possible to deallocate the dispatched operation. Based on the strategy selected for dispatching

functions and scheduling control, the system will dispatch the operations. By using drag and drop, you can manually dispatch the operations also. The features worth noting are sorting, time-based scaling, and search. You can search for a specific operation. With the planning log and scheduling log, you can evaluate the planning process. From the graphical planning table, you can directly navigate to the capacities, orders, and operations, and, if needed, you can change these objects.

8.5.4 SAP Fiori Apps for Capacity Leveling

Under the **Capacity Scheduling Board for Planner** app launcher title, there are two SAP Fiori apps available for capacity leveling: Schedule Production app and Monitor Work Center Schedules app, as shown in [Figure 8.16](#). These apps are available from SAP S/4HANA release 1909 (on-premise edition). From the Schedule Production app, you can seamlessly navigate to the Monitor Work Center app.

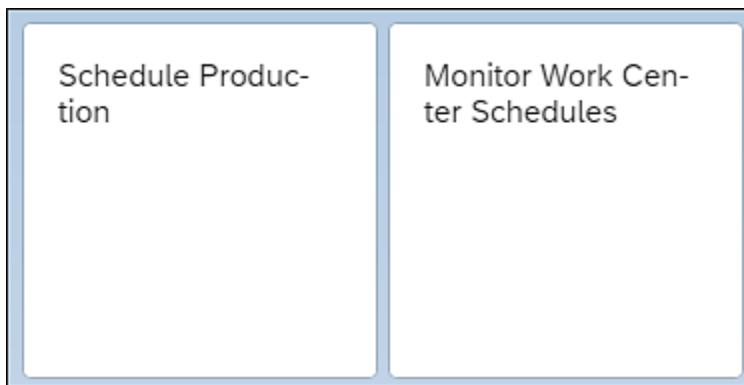


Figure 8.16 Capacity Leveling SAP Fiori Apps

We'll introduce these two apps in this section.

Schedule Production App

The Schedule Production app can be used for planned orders, production orders, and process orders. This app uses the pacemaker work center to dispatch the operations to the date/time specified. By selecting the appropriate strategy, you can select the planning mode, scheduling control, and scheduling direction to appropriately dispatch the orders. The system uses midpoint scheduling and adjusts and reschedules the operations based on the strategy maintained. This app can be used for the following:

- Dispatching operations
- Deallocating already dispatched operations
- Rescheduling already dispatched operations

Before using the app for the first time, there are a few important steps to take:

1. In the **App Settings**, select the appropriate **Industry Type** and **Area of Responsibility**, as shown in [Figure 8.17](#).
2. Set a date range in the **Horizon** filter (a mandatory field in the

app).

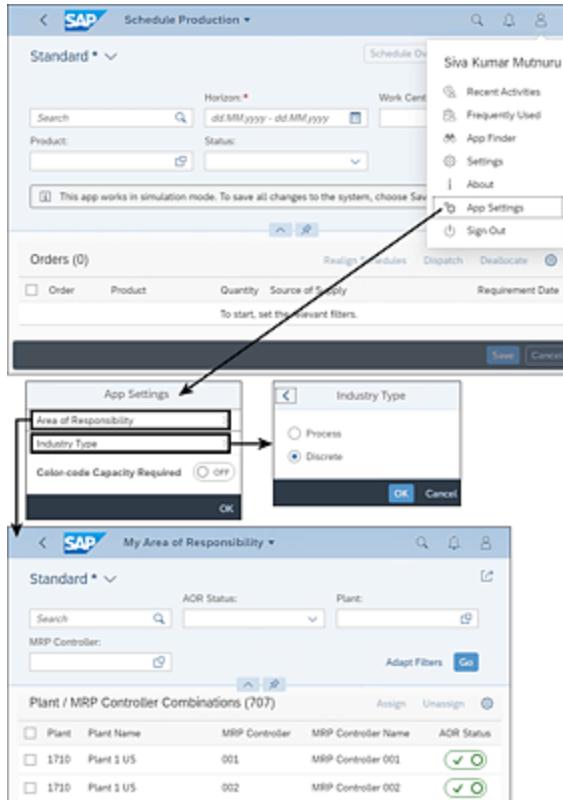


Figure 8.17 Schedule Production App: Initial App Settings

3. The pacemaker work center is the bottleneck work center (resource) in the routing. This app only displays and schedules the pacemaker work centers. As shown in [Figure 8.18](#), the

bottleneck work center is maintained as **Production Line** in the production version.

Figure 8.18 Pacemaker Work Center for the Schedule Production App

4. You can select the planned orders/production orders and click **Dispatch** to dispatch the orders, as shown in [Figure 8.19](#). Make sure to save the selection. You'll also see this message: **This app works in simulation mode. To save all changes to the system, choose Save.**
5. You can switch from the list view to chart view by selecting the **Schedule Overview** button (see [Figure 8.20](#)). In this view, you can see all the operations scheduled in the bottleneck work

center. It's always better to familiarize yourself with the color coding and legend of the app.

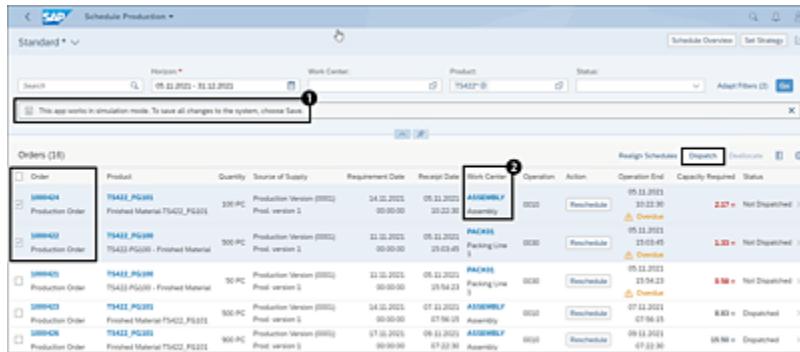


Figure 8.19 Schedule Production App: Dispatch of Planned and Production Orders

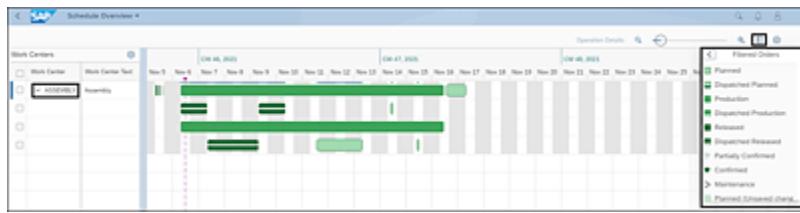


Figure 8.20 Schedule Overview: Chart View

6. Detailed information on the operation can be accessed by selecting the order item line arrow on the right side, as shown in [Figure 8.21](#). You can see the production versions and the available date or shift, and dispatch can be triggered to the appropriate date. From this view, deallocation can also be triggered.

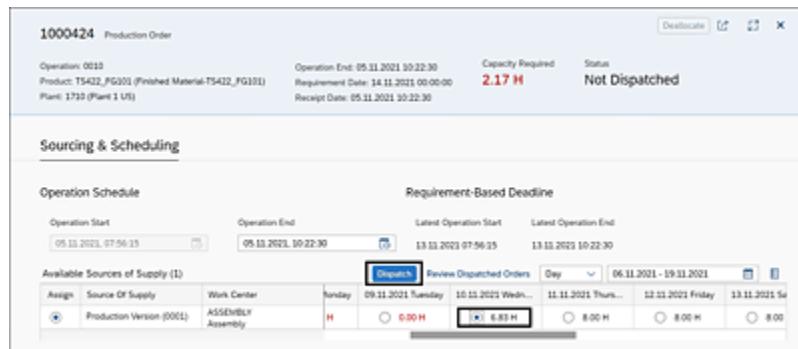


Figure 8.21 Schedule Overview: Detailed Operation Information

Monitor Work Center Schedules App

The important difference between directly accessing the Monitor Work Center Schedules app and accessing it via the Schedule Production app is that you have the option to choose between pacemaker work centers or all work centers. With this app, you can dispatch, reschedule, and deallocate the operations. The **Planning Mode** is always **Sequence**. Product ID and Order ID can be selected from the chart **Settings** as shown in [Figure 8.22](#).

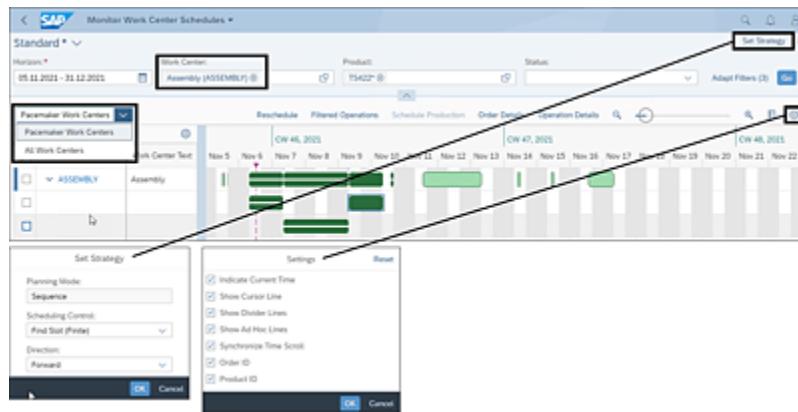


Figure 8.22 Monitor Work Center Schedules App

8.6 Capacity Availability Check

The capacity availability check can be carried out directly in planned orders, production orders, and process orders. For production orders, you can check the capacity availability at the time of order creation, at the time of release, or manually. All operations in the orders are checked one after the other. Make sure that the work center capacities are relevant to the finite scheduling.

When you perform the capacity availability check in the production order interactively, as shown in [Figure 8.23](#). In this scenario you can see there is a capacity overload for one work center, as shown in

Figure 8.24. Among other options, the planner can confirm the capacities, if needed.

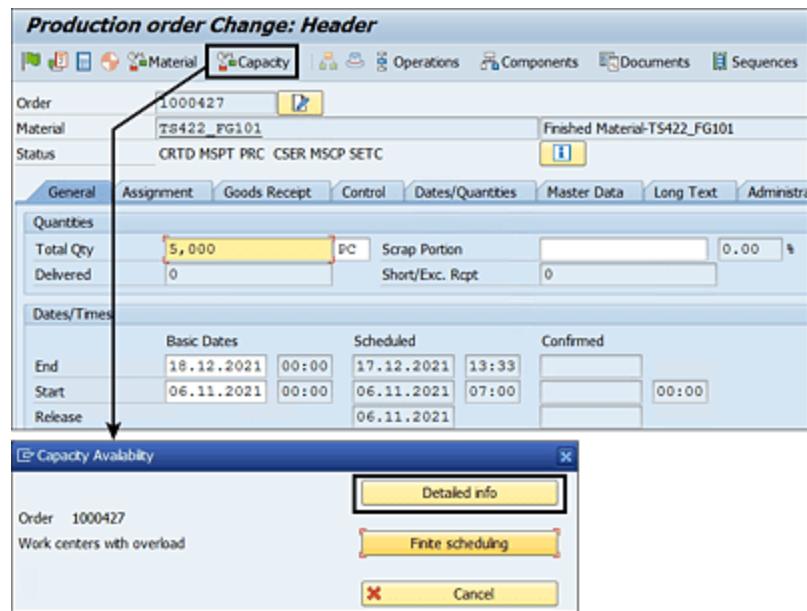


Figure 8.23 Capacity Availability Check in a Production Order

| Capacity Availability | | | | | | |
|--|------------------------------|----------|----------------|----------------------|---------------------------|--------------|
| Order | 1000427 | Cat. | YBML1 | Plant | 1710 | 1 |
| Material | TS422_FG101 | | | | Finished Material-TS422_F | |
| MRP controller | 001 | | | | | |
| System status | CRTD MSPT PRC CSER MSCP SETC | | | | | |
| Operation | 0010 | | | | | |
| <input type="checkbox"/> Capacity confirmed | | ASSEMBLY | Assembly | | | |
| Work center | | 001 | Machine | Load threshold 100 % | | |
| Capacity category | | | | Period | Availability | Requirements |
| | | | | 44.2021 | 3,360.00 | 1,754.55 |
| | | | | 45.2021 | 3,360.00 | 4,350.91 |
| | | | | 46.2021 | 3,360.00 | 914.55 |
| Operation | 0020 | | | | Rqmts.order | CapLoad |
| <input checked="" type="checkbox"/> Capacity confirmed | | TESTING | Testing | | 914.55 | 52.2 % |
| Work center | | 001 | Machine | Load threshold 100 % | | |
| Capacity category | | | | Period | Availability | Requirements |
| | | | | 46.2021 | 3,360.00 | 2,743.64 |
| | | | | 47.2021 | 3,360.00 | 2,286.36 |
| Operation | 0030 | | | | Rqmts.order | CapLoad |
| <input checked="" type="checkbox"/> Capacity confirmed | | PACK01 | Packing Line 1 | | 2,743.64 | 81.7 % |
| Work center | | 001 | Machine | Load threshold 100 % | | |
| Capacity category | | | | Period | Availability | Requirements |

Figure 8.24 Capacities with Overload

During the production order creation or release, the capacity availability can be checked (as described in [Chapter 5](#)) to determine whether the available capacity is sufficient or not. Based on the settings maintained for the business process requirements, the production order can be created or released, the production order creation or release can be denied, or the production scheduler can make a call on whether to create/release the order. As shown in [Figure 8.25](#), the relevant settings can be maintained in Transaction OPJK.

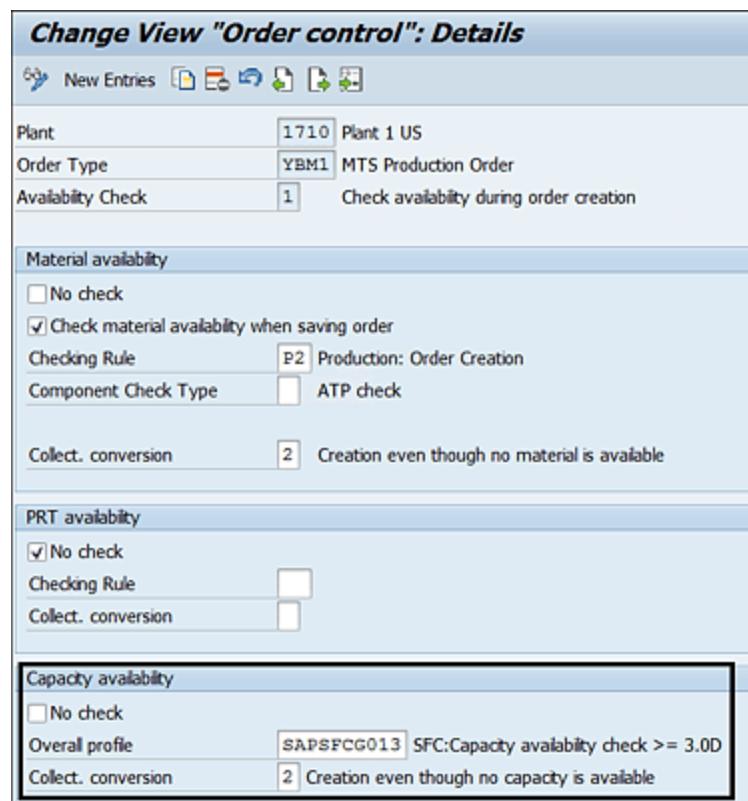


Figure 8.25 Check Control for Capacity Availability Check

[»] Note

If no overall profile is selected in Transaction OPJK, the system uses the standard profile **SAPSFCG013**.

After you decide how to create/release production orders based on the capacity availability check in collective processing, there is one more subsequent customization setting to make for the production scheduling profile (**Prod. Sched. Profile**) with Transaction OPKP (see [Figure 8.26](#)). Here the overall profile is used for dispatching but not for the capacity availability check. You can make the following definitions as well:

- **Confirm Capacity**

Determines whether the confirmed capacity requirements are transferred or discarded.

- **Finite Scheduling**

Determines whether to carry out finite scheduling.

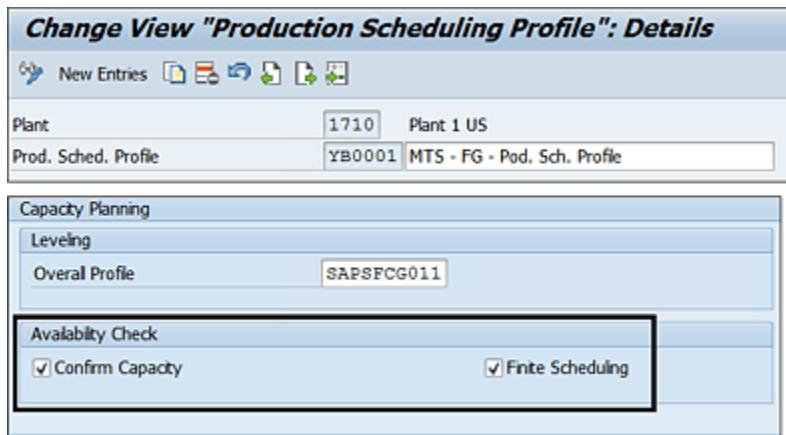


Figure 8.26 Production Scheduling Profile

8.7 Important Terminology

In this chapter, the following terminology was used.

- **Available capacity**

Available capacity is the difference between planned capacity (maintained in the work center capacity header view) and the requirements on the capacity by way of planned/production order requirements.

- **Capacity evaluation**

The analysis of capacity load of a work center is called capacity evaluation, where a capacity is checked for overloading or underloading. With SAP GUI transactions (Transactions CM01, CM02, etc.) and a newly available SAP Fiori app (Manage Work Center Capacity app), capacity loads can be evaluated.

- **Capacity leveling**

The main objective of capacity leveling is to level overload and underload of capacities at work centers to achieve a feasible production plan.

- **Dispatching**

Dispatching is the main step of capacity leveling. You dispatch the operations where there is sufficient capacity so that they can be executed.

- **Finite scheduling**

In finite scheduling, the system considers the available capacity at the work center and schedules the operation. If the work center is overloaded or insufficient capacity is available, then finite scheduling can be used to find the next available date where there is sufficient available capacity. During finite scheduling, whether to

consider forward scheduling or backward scheduling can be configured with the strategy profile. You can perform finite scheduling during the capacity availability check or during dispatching.

- **Lead-time scheduling**

Lead-time scheduling calculates the production dates based on the routing data maintained. To generate capacity requirements, lead-time scheduling is a prerequisite (in the planning run) for planned orders. With the creation of production orders, the system will perform lead-time scheduling for operations.

- **Midpoint scheduling**

In midpoint scheduling of an operation, the system considers the start and end dates of the dispatched operation and determines an appropriate date for the operation (based on the strategy, backward scheduling, or forward scheduling). At this stage, the system considers the dispatched operation as the base and adjusts the dates of the nondispatched preceding operation and succeeding operations of the order to new dates.

8.8 Practice Questions

These questions will help you evaluate your understanding of the topics covered in this chapter. They are similar in nature to those on the certification examination. Although none of these questions will be found in the exam itself, they will allow you to review your knowledge of the subject. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers and only correct answers to receive credit for the question.

1. Which statement is correct? If you want to perform capacity planning for planned orders, then execute the MRP Live run with:
 - A.** Basic date scheduling
 - B.** Midpoint scheduling
 - C.** Finite scheduling
 - D.** Lead-time scheduling
2. When will the load on the capacities reduced? Note: (There are three correct answers.)
 - A.** With the operation confirmation
 - B.** If you lock an order (**LKD**)
 - C.** If you set the order status to **DISP**
 - D.** If the order status is set to **TECO**
 - E.** With **MSPT** status
3. True or False: If you dispatch the operation of a planned order, the planned order will be updated with the **Firming** indicator and **Capacity Dispatched** indicator.
 - A.** True

- B.** False

4. Capacity planning is available in which of the following areas?
(There are three correct answers.)

- A.** Sales and distribution
- B.** Materials management
- C.** Project systems
- D.** Quality management
- E.** Plant maintenance and customer service

5. Which statements are correct with reference to capacity leveling? (There are three correct answers.)

- A.** Dispatch of operations is the main function of capacity leveling.
- B.** The tabular capacity planning table provides period-oriented aggregated information for the available capacities.
- C.** The drag and drop method can be used for dispatching in graphical planning.
- D.** Both tabular and graphic planning tables are part of future architecture of SAP S/4HANA.
- E.** One work center can't be occupied by several operations at the same time.

6. True or False: In the context of the Manage Work Center Capacity app, you can flexibly evaluate the work center capacities and change the shifts of the work center capacity.

- A.** True
- B.** False

7. Which statements are correct with reference to the Schedule Production app? (There are three correct answers.)

- A.** You can perform dispatch, deallocate, and reschedule of operations.
 - B.** This app is applicable only for pacemaker or bottleneck work centers.
 - C.** You can have more than one work center as a bottleneck work center.
 - D. Planning Mode** can be selected flexibly between **Bucket** and **Sequence**.
 - E.** Only the **Chart** view is available for this app.
8. Which statements are correct with reference to the Monitor Work Center Schedules app? (There are three correct answers.)
- A.** You can perform dispatch, deallocate, and reschedule of operations.
 - B.** This app is applicable only for pacemaker or bottleneck work centers.
 - C. Planning Mode** is both **Bucket** and **Sequence**.
 - D.** This app is available only in chart format.
 - E.** Only pacemaker work centers are displayed as default, but you can select all the work centers with this app.

8.9 Practice Answers and Explanations

1. Correct answer: D

Capacity requirements will be generated with lead-time scheduling only. With an MRP run, the system will consider infinite capacities and schedule the orders. For a feasible production plan, it's required to perform capacity leveling

2. Correct answers: A, B, and D

With operation confirmations (both partial and final confirmation), the load on the capacities will be reduced appropriately. If you set the order status to TECO, then all the remaining loads on the capacities will be reduced. If you lock the order, then all the capacity requirements will be reduced.

3. Correct answer: A

The statement is true. Planned orders will receive the **Capacity Dispatched** indicator and **Firming** indicator with the dispatch of an operation, as shown in [Figure 8.27](#). The system won't automatically reschedule while performing lead-time scheduling.

| Firming | |
|---------------------|-------------------------------------|
| Planned Order | <input checked="" type="checkbox"/> |
| Components | <input type="checkbox"/> |
| Capacity Dispatched | <input checked="" type="checkbox"/> |

Figure 8.27 Planned Order: Firming and Capacity Dispatched indicators

4. Correct answers: A, C, and E

Capacity planning is available in sales and distribution. Within project systems, in the **Project** view and **Network** view, you can perform capacity leveling. In plant maintenance and customer service, you can access individual machine capacities or service personnel capacity and optimize the load on them.

5. Correct answers: **A, B, and C**

Dispatching operations is the main aim of capacity leveling. Operations are dispatched to the time when there is sufficient capacity. In tabular planning tables, aggregated capacity information is available. The drag and drop method for dispatching operations can only be performed with graphical capacity planning tables. The CM* transactions (includes tabular and graphical planning table) aren't considered for the future architecture of SAP S/4HANA. There are new SAP Fiori apps that perform similar tasks for capacity planning. One work center can be occupied by several operations at the same time, and you can check the same by following the menu path **Edit • Multiple Commitment • Show** in the graphical planning table.

6. Correct answer: **A**

With the Manage Work Center Capacities app, you can evaluate work center capacities, change the shifts of capacities, and display orders and operations.

7. Correct answers: **A, B, and D**

The Schedule Production app can be used for dispatch, deallocate, and reschedule of operations. This app is specifically designed for pacemaker or bottleneck operations. You can designate a work center as a pacemaker by assigning it as a production line in the work center. You can assign only one work center in the **Production Line** field. The **Planning Mode** can be

selected either as **Bucket** or **Sequence**. By selecting the **Schedule Overview** button, you can view the **Bucket** view, and with further navigation, you can access the **Chart** view also.

8. Correct answers: **A, D, and E**

The Monitor Work Center Schedules app can be used for dispatch, deallocate, and reschedule of operations. You can display both pacemaker and all other work centers, but the pacemaker work center option is the default (you can change the selection). This app is only available in graphical chart form.

8.10 Test Takeaway

This chapter is built on providing the usefulness of capacity planning as a topic for implementation in customer projects. This topic is often considered as a second step in the project environment. Unless the available capacities and work center loads are considered during the planning for execution of production, smooth production schedules can't be achieved. Managing the capacity planning transactions in SAP GUI isn't considered for future architecture. There is a limit to the availability of these transactions. The newly available SAP Fiori apps are built on the premise of capacity maintenance, capacity evaluation, and detailed planning. Because of this, the handling of these SAP Fiori apps is much more convenient and easier to operate, which will give the planners and end users a modern tool for effective capacity planning. These tools can't solve all the capacity planning challenges, but most of the organizations can adopt them. For more complex situations and scenarios, embedded PP-DS is a superior tool.

8.11 Summary

Capacity planning can be performed for planned orders, production orders, and process orders. But in this chapter, the focus was on discrete manufacturing, so we only considered planned orders and production orders. Capacity planning is an integral part of SAP ERP and SAP S/4HANA. MRP can't solve the capacity issues, so after the MRP run, capacity planning is a next step to solve the overload and underload of work center capacities for a stable product plan. There are various tools available in SAP S/4HANA that can be best used for effective capacity planning. In the next chapter, we'll discuss the detailed scheduling component of PP-DS, which can handle more complex capacity situations and more business requirements in this area.

9 Advanced Planning

Techniques You'll Master

- Required master data and setup for advanced planning
- Configuration requirements for advanced planning
- Executing production planning in embedded PP-DS
- Detailed scheduling (DS) prerequisites and execution in embedded PP-DS
- Exceptions and alerts identification using Alert Monitor in advanced planning
- Predictive material and resource planning (pMRP)
- Demand-driven material requirements planning (DDMRP) in SAP S/4HANA

The focus of this chapter is to explain advanced planning processes and functions, prerequisites for setting up advanced planning, and available tools and techniques for DS. You'll understand the customization of various DS planning board (or DS board) profiles and DS strategies, and you'll learn how to manage orders in interactive planning. An overview of predictive material and resource planning (pMRP) and demand driven material requirements planning in SAP S/4HANA is also provided.

[»] Disclaimer

When the SAP Advanced Planning and Optimization PP-DS module was moved to SAP S/4HANA, its name changed to

advanced planning in SAP S/4HANA.

The PP-DS component in SAP S/4HANA is also called embedded PP-DS. The terms are interchangeable in SAP S/4HANA, so in the subsequent sections, the PP-DS component in SAP S/4HANA is referred to as embedded PP-DS, and sometimes it's referred to as advanced planning in SAP S/4HANA.

Real-World Scenario

As a planner, you'll be required to make the plan, adjust the plan to accommodate the short-term unplanned changes due to downtimes or urgent customer requirements, and schedule or reschedule the production plan based on capacity constraints. A planner faces such challenges every day. Planners should have an understanding of various functions available in SAP and have the knowledge to apply it in day-to-day business.

As a consultant, you'll be required to understand the various functions available in advanced planning and how and where a specific function will help the customer's business. You'll need a thorough understanding of the advanced planning concepts in order to discuss the options and suggest the ones most suitable for the business requirements.

For complex manufacturing scenarios, SAP S/4HANA advanced planning has the capability to optimize the capacity use of the resources and adhere to the production schedule to minimize delays.

In a manufacturing organization with many operations in execution, it's important to identify the bottleneck resource and run DS processes around it while keeping the dependencies intact.

It's key to ask the appropriate questions to find out how best the out-of-the-box SAP S/4HANA features or functionalities can be suggested and adopted to the customer's business needs.

If the master data is set properly in planning, then half the task is done in SAP S/4HANA advanced planning because it's the key to the planning process. A consultant knows the master data and knows the impact it has on advanced planning.

If needed, the consultant should be able to undertake customization of new heuristics, DS boards, and so on to collaborate with manufacturing. This knowledge will be useful in managing support cases/issues as well.

9.1 Objectives of This Portion of the Test

The objective of the portion of the certification is to test your knowledge in advanced planning and your understanding of advanced planning techniques:

- Different types of planning heuristics, differences between them, and which planning heuristic to be used in what kind of manufacturing environment will be broadly checked during the test.
- Managing planned orders, how planned orders are created, scheduled, and converted in advanced planning, the influence of relevant fields in the material master on overall advanced planning management will also be covered in the exam.

- This part of the test will also verify your understanding of the concept and usage of pMRP and DDMRP.

[»] Note

The advanced planning topic makes up > 12% of the total exam.

[»] Note

If no external planning tool, for example, SAP Integrated Business Planning for Supply Chain (SAP IBP), is used, a forecast can also be added in embedded PP-DS directly. In such cases, planned orders are generated using MRP Live, which are then considered for capacity leveling and sequencing in embedded PP-DS.

9.2 Overview of Advanced Planning and Production Planning and Detailed Scheduling (PP-DS)

SAP Advanced Planning and Optimization is a well-known and established advanced planning tool that provides short-term to long-term planning possibilities with advanced heuristics algorithms.

With the ever-changing dynamics of the supply chain and new constraints, it was imperative to focus on a tool that was capable of predicting and also being responsive to unplanned changes.

Keeping in mind these challenges, SAP introduced SAP IBP to be the frontend planning tool for mid- to long-term planning with the predictive and responsive planning capability throughout the supply chain network, while using production planning and detailed scheduling (PP-DS) for short-term production planning with the power of the SAP HANA database layer. The PP-DS element of SAP Advanced Planning and Optimization has been merged with SAP S/4HANA and called advanced planning or embedded PP-DS, while the demand and supply network planning elements are moved to SAP IBP and called SAP IBP for demand and SAP IBP for response and supply, respectively.

PP-DS helps to plan production and detailed scheduling of orders by considering the available resource capacities and alternate production possibilities in the production plant on a short-term horizon.

PP-DS is also used to generate proposals based on the requirements for the products, which are either externally procured or produced without any capacity constraints to cover requirements. It generates an executable production plan to achieve efficiency such as the following:

- Improve usage of production capacities and alternate resource usage, where required.
- Reduce production lead time after considering setup times, the setup matrix, wait times, and so on.
- Use advanced heuristic algorithms to follow capacity constraints.

SAP S/4HANA is used for master data maintenance, for manufacturing execution functions (e.g., confirmations, goods receipts postings, or purchasing), and for planning uncritical products, while embedded PP-DS is used to plan and schedule critical products and components in SAP S/4HANA.

As part of the classic business planning process, PP-DS focuses on plant production and scheduling, that is, on the short-term horizon. It aims to optimize the usage of production resources, and finitely schedule and sequence the orders in the production plant. Capacity leveling in PP-DS is executed for the planned orders that are generated either by material requirements planning (MRP) or from SAP IBP. Planned orders are sequenced or moved to alternate resources or lines to make sure a feasible production plan is generated without exceeding the production resource capacities and production lead time. The PP-DS plan is then frozen, and orders are converted, released, and finally handed over to production for execution.

9.3 Master Data for Production Planning and Detailed Scheduling

As in earlier SAP Advanced Planning and Optimization PP-DS, advanced planning in SAP S/4HANA follows the same key concept of using master data from connected SAP ERP systems. In SAP S/4HANA, this integration is made easier because advanced planning has now been embedded into the same SAP S/4HANA box and called embedded PP-DS.

Master data such as material masters and work centers are created in SAP S/4HANA and are immediately available for advanced planning usage depending on whether location master data already exists in embedded PP-DS. This reduces the effort of running integration models on a regular basis to transfer the new data element created in SAP S/4HANA as compared to its predecessor SAP Advanced Planning and Optimization PP-DS. As we know, queue resolution due to master data transfer errors was one of the key concerns with the SAP Advanced Planning and Optimization PP-DS Core Interface (CIF), which with embedded PP-DS is no longer a concern due to built-in integration.

In this section, we'll cover the master data required for advanced planning with the respective key field's maintenance and its usage. Some of the terms used in this section are used due to conventional terminologies between SAP ERP and SAP Advanced Planning and Optimization, as listed in [Table 9.1](#).

| SAP ERP | Embedded PP-DS |
|-------------------------|----------------|
| Plant, customer, vendor | Locations |

| SAP ERP | Embedded PP-DS |
|--------------------|---------------------------------|
| Material | Product |
| Work center | Resource |
| Production version | Production data structure (PDS) |

Table 9.1 SAP ERP and SAP Advanced Planning and Optimization Terminologies

9.3.1 Core Interface

CIF is a standard interface provided by SAP to enable real-time integration between SAP ERP and SAP Advanced Planning and Optimization. In SAP S/4HANA, because advanced planning is embedded, CIF isn't required in most cases, but it's an important interface to integrate some key master data with the embedded PP-DS component.

CIF is executed in the following steps:

1. Create and generate the integration model (Transaction CFM1).
2. Enter a **Model Name** (define your own unique model name), **Logical System** (logical system to which the data will be transferred), and **APO Application** (give your own application name, e.g., **PIRS** (purchasing info records), as shown in [Figure 9.1](#).
3. Select the material-dependent object, add the respective details

to filter the data, and click on **Execute**.

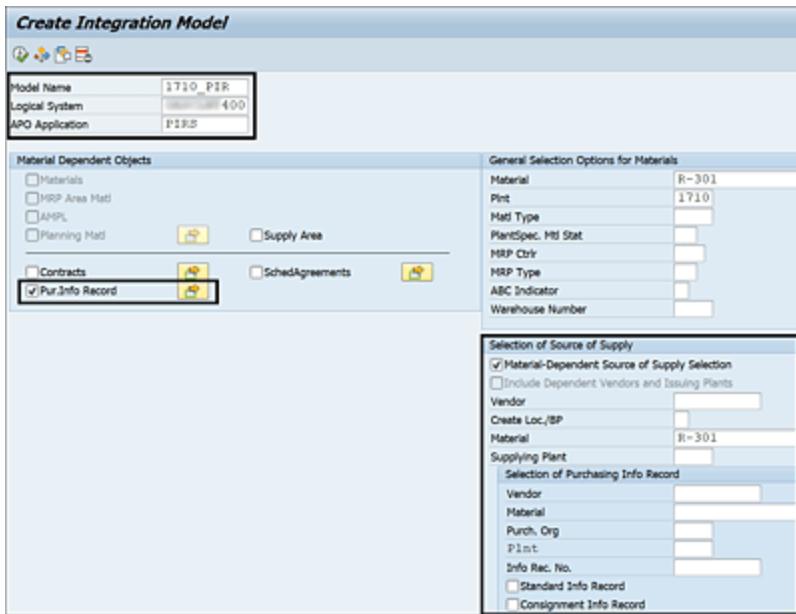


Figure 9.1 Create Integration Model

4. As shown in [Figure 9.2](#), the created integration model should now be generated. You can check the data to be transferred by clicking on the **Detail** button and also run a consistency check by clicking on the **Consistency Check** button. Select the line, and click on **Generate IM**.

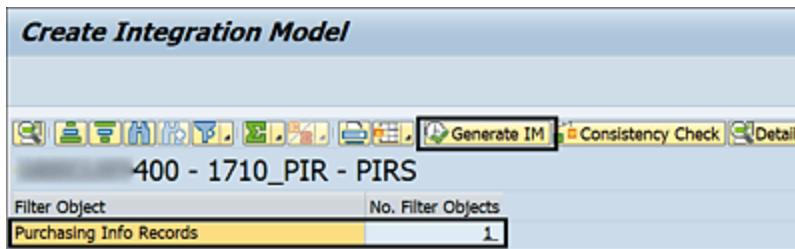


Figure 9.2 Generate Integration Model

After the integration model is generated, next is to activate the integration model to transfer the data to embedded PP-DS by using the following steps:

1. Activate the integration model (Transaction CFM2).

2. Enter the Model Name, Logical System, and APO Application as created earlier and shown in [Figure 9.3](#).

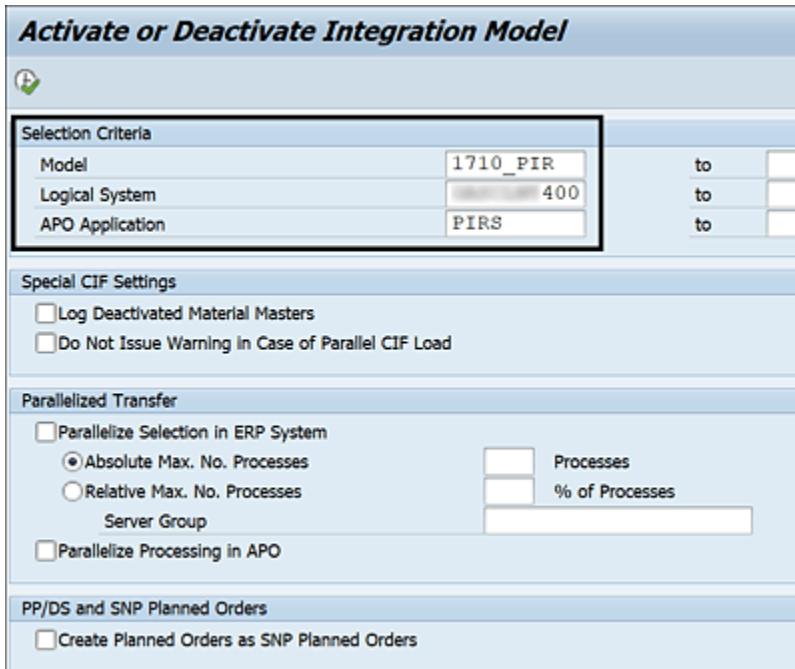


Figure 9.3 Activate Integration Model

3. Select the integration model that needs to be integrated with embedded PP-DS, and click on **Active/Inactive**. Once activated, the **New Status** changes to a green checkmark to show it's active. Click on **Start** to activate and transfer the data to embedded PP-DS, as shown in [Figure 9.4](#).

| Created On | Changed At | Created By | Prev. Status | New Status |
|------------|------------|------------|--------------|------------|
| 30.11.2021 | 10:53:50 | | ✗ | ✗ |
| 15.07.2021 | 11:24:39 | | ✗ | ✗ |
| 23.06.2021 | 17:00:04 | | ✓ | ✓ |

| Created On | Changed At | Created By | Prev. Status | New Status |
|------------|------------|------------|--------------|------------|
| 30.11.2021 | 10:53:50 | | ✗ | ✓ |
| 15.07.2021 | 11:24:39 | | ✗ | ✗ |
| 23.06.2021 | 17:00:04 | | ✓ | ✗ |

Figure 9.4 Activate and Start Integration Model

9.3.2 Locations (Plant, Customer, Vendor)

In SAP S/4HANA, you no longer need the **Publication** setting to transfer plant data to embedded PP-DS. Instead, SAP-provided report /SAPAPO/CREATE_LOCATION is used to create the location master in embedded PP-DS. This report reads Customizing table T001W, transfers the plant and shipping points (if available), and maintains the business partner information and country key to the location master in embedded PP-DS, as shown in [Figure 9.5](#).

To run report /SAPAPO/CREATE_LOCATION enter plants, shipping points, and business partners in their respective fields. The report identifies all selected entities and creates respective data in embedded PP-DS. With this report, you can also filter and send only advanced-planning-relevant locations to embedded PP-DS similar to SAP Advanced Planning and Optimization CIF.

The screenshot shows the SAP Fiori interface for the report /SAPAPO/CREATE_LOCATION. The title bar reads "Create locations for business partners, plants and shipping points". The interface is divided into four main sections: Business Partner, Plant, Shipping/Receiving Point, and MRP Area. Each section contains input fields for selecting entities and a "to" field for defining relationships. To the right of each section are four small icons, likely for further configuration or processing steps.

| Create locations for business partners, plants and shipping points | | | |
|--|--------|----|-----|
| Business Partner | | | |
| Business Partner | BP1710 | to | [] |
| Category | [] | to | [] |
| Role | [] | to | [] |
| Country | [] | to | [] |
| Plant | | | |
| Plant | 1710 | to | [] |
| Shipping/Receiving Point | | | |
| Shipping Point/Receiving Pt | [] | to | [] |
| Country | [] | to | [] |
| MRP Area | | | |
| MRP Area | [] | to | [] |

Figure 9.5 Create Locations for Business Partners, Plants, and Shipping Points in Embedded PP-DS

With the use of SAP-provided business add-in (BAdI) /SAPAPO/LOC_CREATE, a location can also be created immediately after

the business partner is created and saved in SAP S/4HANA; at the same time, an update to the existing location is done as well. A separate report, /SAPAPO/UPD_LOC_SP_P, can also be used to update the location as a regular job.

After the location is created in embedded PP-DS, local changes such as updating inbound and outbound resources, calendars, and so on can be done in the location master using Transaction /SAPAPO/LOC3, as shown in [Figure 9.6](#).



Figure 9.6 Change Location Master in Embedded PP-DS: Transaction /SAPAPO/LOC3

9.3.3 Product (Material) Master

Because PP-DS is now embedded in the SAP S/4HANA core, it's no longer required to run an integration model to transfer materials to the embedded PP-DS component. This integration is now available with a simple **Advanced Planning** checkbox in the material master under the newly added **Advanced Planning** tab, as explained next.

An additional **Advanced Planning** tab is added in the material master, where additional fields required for advanced planning are maintained, for example, **Product Heuristic**, **PP Plng Procedure**, and **Priority**, which avoids the need to maintain fields in the PP-DS component separately after the product master is created.

At the time of material creation in SAP S/4HANA, you can decide that the product must be integrated in embedded PP-DS and maintain the respective field's values required for advanced planning, as shown in [Figure 9.7](#).

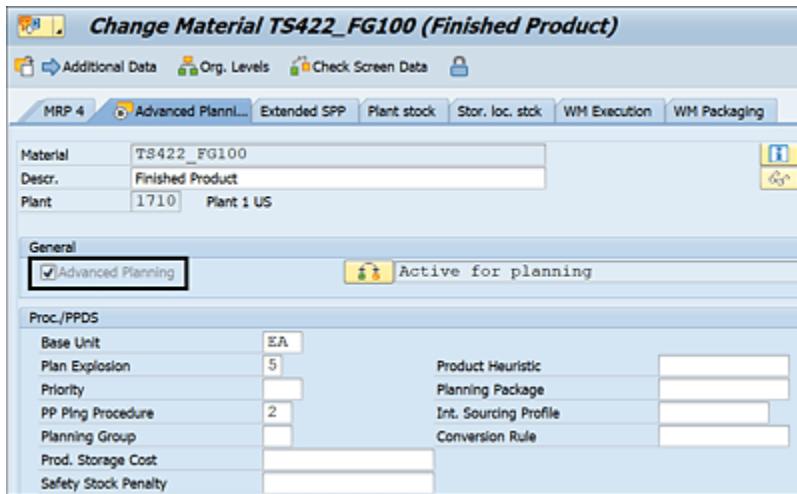


Figure 9.7 Activate Advanced Planning in Material Master: Transaction MM01

In the **Advanced Planning** tab shown in [Figure 9.8](#), you can maintain additional fields such as **Plan Explosion**, specific **PP Plng Procedure**, **Product Heuristic**, **Pegging Strategy**, **Proposed strategy**, **GR Processing Time**, and so on. If no values are maintained in these fields, the system takes the default values automatically (e.g., **PP Plng Procedure 2**), bases them on MRP view values (e.g., planning strategy 40 in the **MRP** view transfers as

20 in the Proposed Strategy field in embedded PP-DS), or sets them as blank.

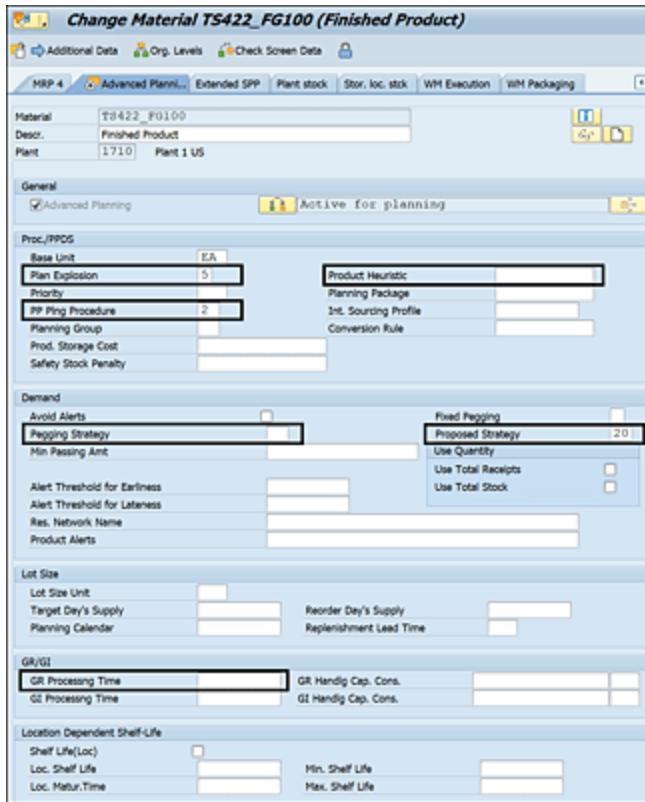


Figure 9.8 Maintain Additional Fields in Advanced Planning View of the Material Master

The product master in embedded PP-DS takes over the field values maintained in the MRP views and the Advanced Planning view, so it's no longer possible to change these values in embedded PP-DS using Transaction /SAPAPO/MAT1.

Figure 9.9 shows the Demand view and PP/DS view in embedded PP-DS after creation of the product master. The field values are

based on the values maintained in the material master ([Figure 9.8](#)) during creation.

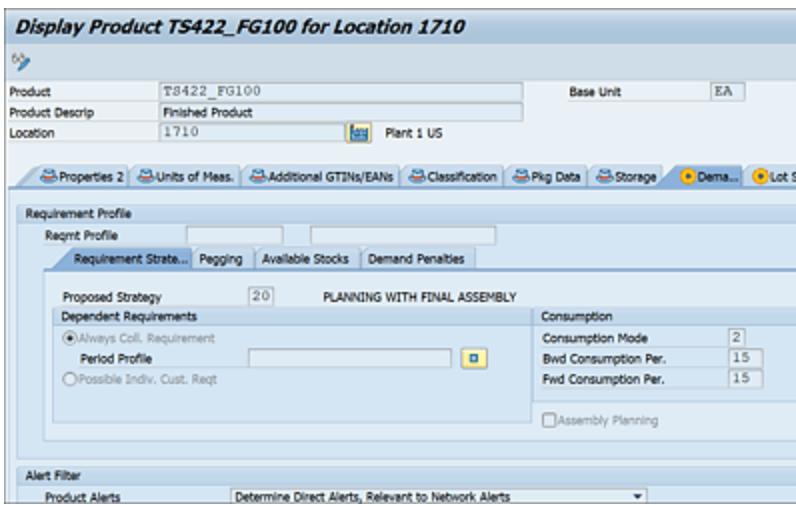


Figure 9.9 Demand and PP/DS Views in the Embedded PP-DS Product Master

[»] Note

It's no longer possible to create a product master directly using Transaction /SAPAPO/MAT1 in embedded PP-DS. Rather, a material has to be first created in an SAP S/4HANA component and activated for advanced planning to make it available in embedded PP-DS.

If you're in the **Change** view in Transaction /SAPAPO/MAT1, it may not be possible to update the **Advanced Planning** view in Transaction MM02.

9.3.4 Resources (Work Centers)

In SAP S/4HANA, there is no need to create an integration model for work centers. A work center is created with Transaction CR01 and activated for advanced planning in the **Basic Data** view of the work center, which in turn creates a resource master in embedded PP-DS.

Fields maintained in the work center are transferred to the resource master and can be viewed using Transaction /SAPAPO/RES01. Resources in embedded PP-DS can no longer be maintained if the resource is externally managed in embedded PP-DS.

The naming conventions in the resource master of embedded PP-DS remains the same as in SAP Advanced Planning and Optimization PP-DS. This starts with “W” followed with the “work center” name (here, 1710_FA), “plant” (here, 1710), and “capacity category” (here, 001) from the work center, for example, W1710_FA_1710_001.

Figure 9.10 shows the **Advanced Planning** checkbox, which, once activated, creates a resource master in embedded PP-DS when saved. This eliminates the need for running a separate integration model after creation.

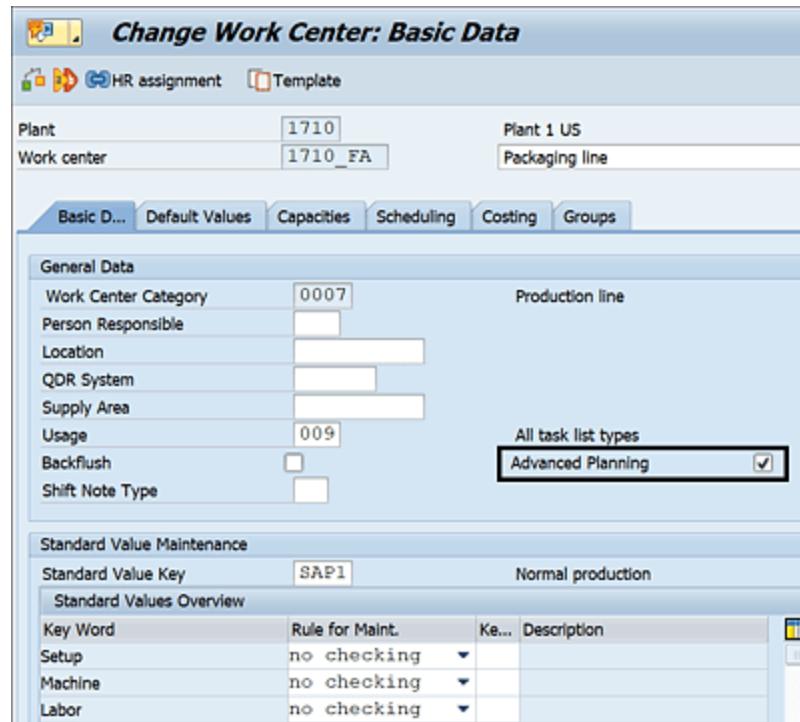


Figure 9.10 Activate Work Center for Advanced Planning

In a work center, it's important to maintain the **Capacity** view and the required fields the **APO Resource** tab, as shown in [Figure 9.11](#).

With the SAP Advanced Planning and Optimization supply network planning module no longer available in SAP S/4HANA, mixed resources aren't allowed. A handling resource must also be created in a similar way because only changes in resource data are allowed in embedded PP-DS.

Once saved, the corresponding resource master is immediately created in the embedded PP-DS component of SAP S/4HANA, and all fields are transferred, as shown in [Figure 9.12](#).

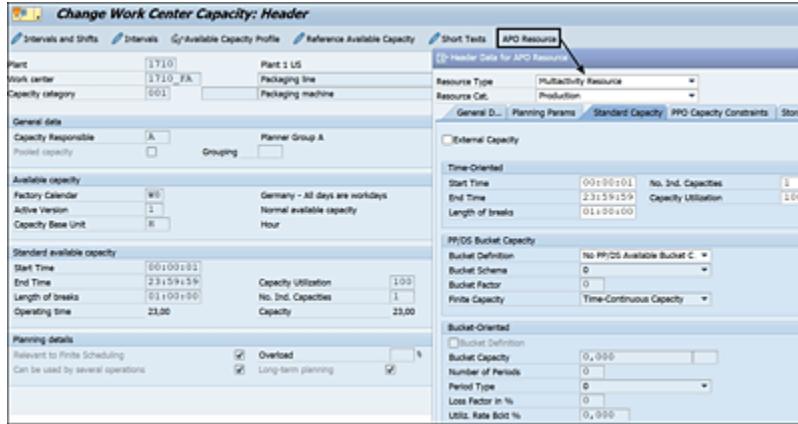


Figure 9.11 Work Center Creation and Maintenance of the APO Resource Tab with Transaction CR01

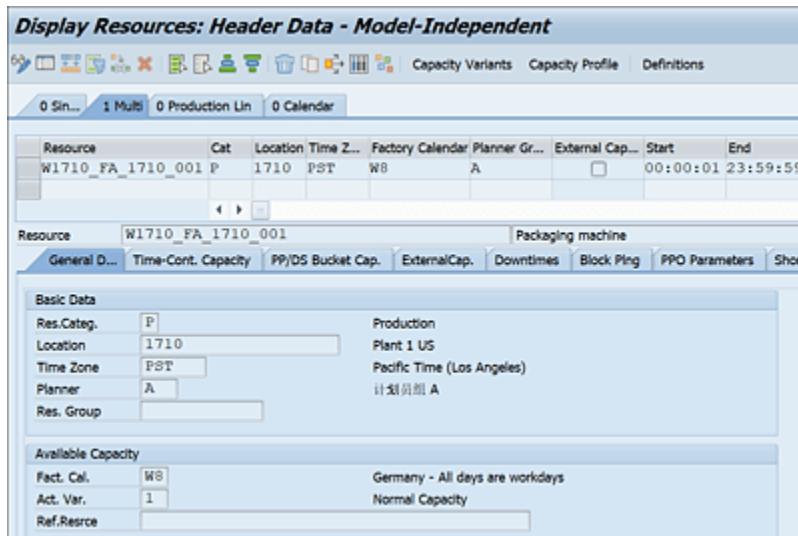


Figure 9.12 Resource Master View in Embedded PP-DS

[»] Note

It's no longer possible to create a resource master directly using Transaction /SAPAPO/RES01. Instead, the work center has to be

first created using Transaction CR01 and activated for advanced planning.

However, it's possible to maintain downtimes and assign block planning class definitions directly in embedded PP-DS. Depending on the settings for resources in Transaction CFC9, you can also maintain and create shifts in the resource master in embedded PP-DS.

9.3.5 Source of Supply

In this section, we'll discuss different sources of supply and their integration with embedded PP-DS.

Production Data Structures (Production Versions)

The source of supply for product produced in-house represents the operations required to produce a product and the components involved.

Production version combines bills of materials (BOMs) and routing, thus providing detailed information on the assemblies, subassemblies, and raw materials used, as well as the operations performed to produce a finished product.

You can view the production version using Transaction C223 or in the material master under the **MRP 4** view in SAP S/4HANA. In SAP S/4HANA, production versions are integrated to embedded PP-DS using new enhanced Transaction CURTOADV_CREATE (PDS Transfer [PP-DS]). The same transaction is used to integrate subcontracting relations. Subcontracting materials have a BOM but no routing information; therefore, to transfer the component information of subcontracting, you need to maintain a production

version for the subcontracting material. This production version is in turn maintained in the subcontracting purchasing info record to provide a link between the subcontracting BOM and the vendor information. Subcontracting in SAP S/4HANA embedded PP-DS works with MRP areas: MRP area for subcontracting vendors to be customized and MRP area for subcontracting components to be maintained in the material master.

To transfer production versions to embedded PP-DS, you can use different filter options to make sure only the relevant relations are transferred to embedded PP-DS for advanced planning. [Figure 9.13](#) shows the available filter options. Use **Absolute Transfer** for the initial load of the production version to embedded PP-DS, and use the **Change Transfer** option for delta loads to embedded PP-DS.

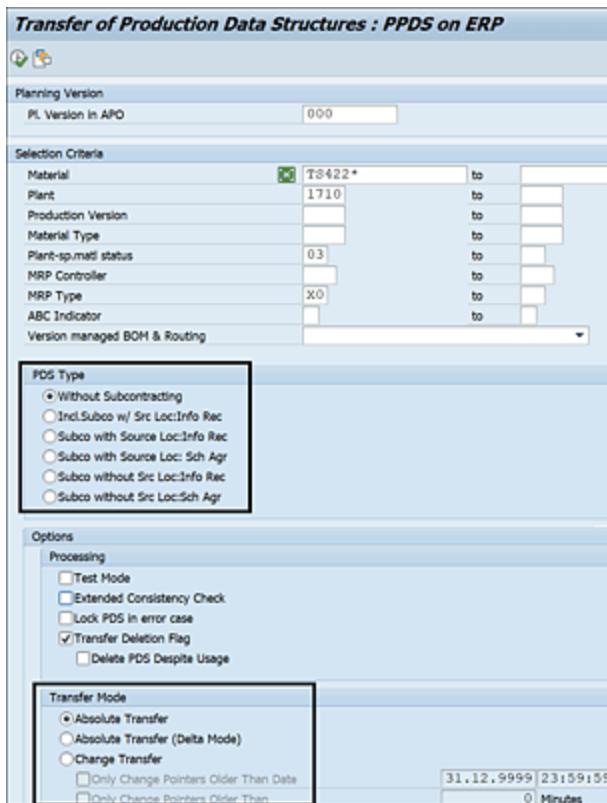


Figure 9.13 Transfer Production Version to Embedded PP-DS

The integrated production data structure (PDS) in embedded PP-DS can be viewed using Transaction /SAPAPO/CURTO_SIMU, which gives a consolidated view where each view provides detailed information of the data maintained in the BOM (**Components**), as shown in [Figure 9.14](#); routing (**Operations/Activities/relations**) in [Figure 9.15](#) and [Figure 9.16](#); and **Production Version Header** details. You can extend each view by clicking on the + sign, and

each view provides the last level of details maintained in the master data in SAP S/4HANA.

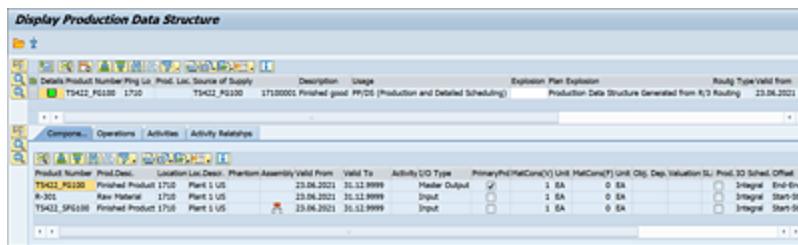


Figure 9.14 Component View to Display BOMs

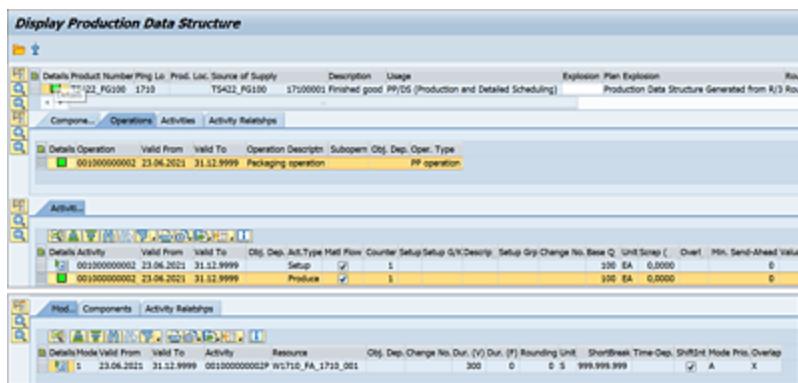


Figure 9.15 Operation View Displays Routing Information

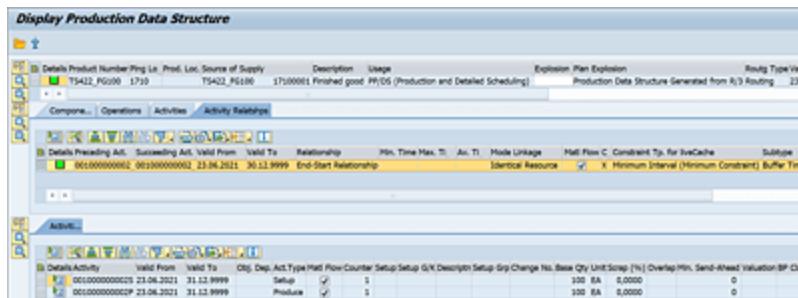


Figure 9.16 Activity Relatshps View Displays Details of Each Operation and Their Relation in Routing

[+] Tip

You need to find the root cause if the materials, work centers, and operations aren't transferred to the embedded PP-DS. Only these

materials, work centers, and operations get transferred to the embedded PP-DS:

- Only the materials with **Advanced Planning** active are integrated and visible in the PDS.
- Only the work centers with **Advanced Planning** active are integrated and visible in the PDS.
- Only the operations with control key in routing, relevant for scheduling and capacity requirements, are transferred and visible in the PDS.
- Only operations with activity time of nonzero or BAdI `CUSLNTRTO_ADDIN` activated will transfer to the PDS.

External Procurement Relations

For procured product (either externally procured or procured from other plant locations), sources of supply provide information regarding where the product is procured. The source of supply represents the following elements:

- **Externally procured materials (purchasing info records, scheduling agreements, contracts)**
If a material has a purchasing info record, contract, or scheduling agreement maintained in SAP S/4HANA, these are transferred via CIF, and a procurement relation is created in PP-DS. This relation

can be viewed with Transaction /SAPAPO/PWBSRC1, as shown in [Figure 9.17](#).

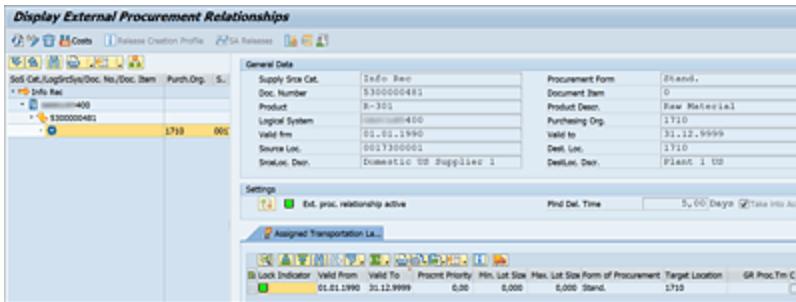


Figure 9.17 External Procurement Relationships in PP-DS

- **Stock transfers**

A stock transfer is when a material is transferred from another production location and has the respective special procurement key maintained in the **MRP 2** view. Once integrated to embedded PP-DS, a corresponding transportation lane is created at the time of material creation if the material and its dependent data already exists in embedded PP-DS (e.g., source location and product in source location). A transportation lane can be updated with relevant information in embedded PP-DS, for example, transport duration, transport calendar, and so on in Transaction /SAPAPO/TL1.

In a transportation lane, as shown in [Figure 9.18](#), a **Creation Indicator** specifies how the transportation lane for the selected product was created.

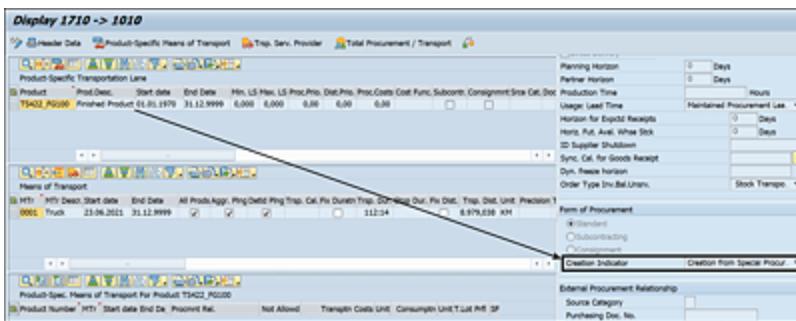


Figure 9.18 Transportation Lane in Embedded PP-DS

As of SAP S/4HANA 2020, purchasing info records, scheduling agreements, and contracts are transferred using the CIF, so a CIF model is generated and activated for the same using Transactions CFM1 and CFM2, as shown in [Figure 9.19](#).

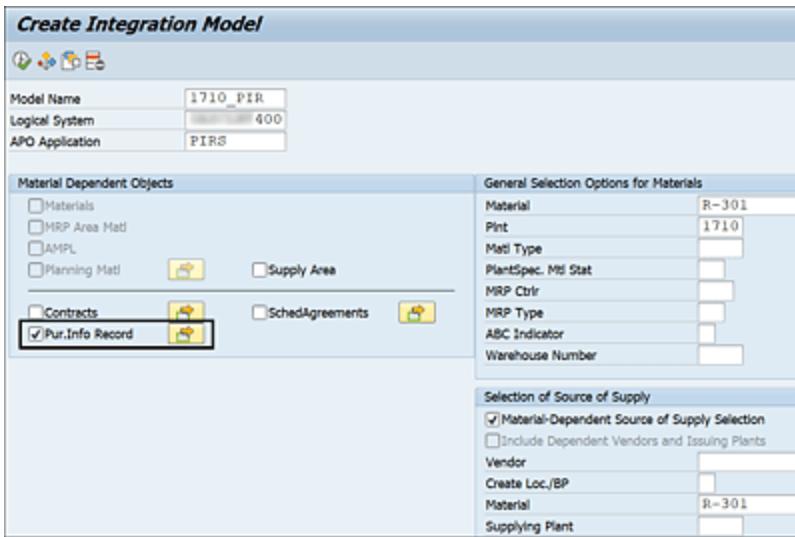


Figure 9.19 Transferring Purchase Info Records, Scheduling Agreements, Contracts to PP-DS via CIF

9.4 Configuration

In this section, we'll look at some of the key configurations required in SAP S/4HANA to enable integration and planning in embedded PP-DS. Even though PP-DS is now part of the SAP S/4HANA core, it still requires some of the CIF settings to enable integration between the former SAP ERP component and embedded PP-DS component of SAP S/4HANA.

In this section, we'll only cover the key required configurations, without which integration and planning with embedded PP-DS can't work.

9.4.1 Activate Advanced Planning and Scheduling in SAP S/4HANA

In SAP S/4HANA, advanced planning must be explicitly activated to use the embedded PP-DS component in SAP S/4HANA. This is provided as an option to the businesses who don't want to use or have no need to use advanced planning functions in the SAP S/4HANA system. It's activated in configuration under **Advanced Planning** and is available with an additional advanced planning license. [Figure 9.20](#) shows the Customizing activity.

Follow the Customizing menu path to activate advanced planning in SAP S/4HANA: **SAP IMG Menu • Advanced Planning • Basic**

Settings • Activate Advanced Planning and Scheduling • Activate Advanced Planning and Scheduling.

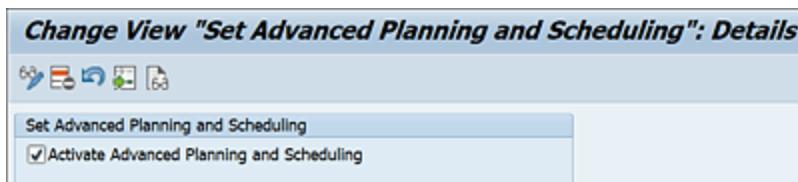


Figure 9.20 Configuration Node: Activate Advanced Planning and Scheduling

9.4.2 Creating the System Landscape

Apart from activation of advanced planning, the CIF setup must be performed because CIF models are still used to integrate some master data to embedded PP-DS. Conventional configurations to execute CIF are still done except publishing for transactional data. These configurations are explained in this section.

You can execute transactions as provided below the individual configuration name or find all the Customizing nodes in the Customizing menu path, **SAP IMG Menu • Advanced Planning • Integration via Core Interface (CIF) • Integration • Basic Settings for Creating the System Landscape**, to display and change the settings in PP-DS as explained in the following steps:

1. Name the logical system (Transaction BD54).

A logical system must be created to represent the PP-DS

system. In SAP S/4HANA, because PP-DS is embedded, it's the same system name, for example (see [Figure 9.21](#)).

| Logical Systems | |
|-----------------|------|
| Log.System | Name |
| 400 | 400 |

Figure 9.21 Name for the Logical System

A logical system enables data transfer to different systems, for example, SAP Advanced Planning and Optimization, embedded PP-DS, and SAP IBP. Each system must have its own logical system name, which is used in the CIF model to transfer data to the respective system that it's connected to.

2. Assign the logical system to a client (Transaction SCC4).

In this step, the logical system is assigned to the system client

(Figure 9.22).

Display View "Clients": Details

| | |
|--|------|
| | |
| Client | 400 |
| City | |
| Logical system | 400 |
| Currency | EUR |
| Client Role | Test |
| Changes and Transports for Client-Specific Objects | |
| <input checked="" type="radio"/> Changes without automatic recording | |
| <input type="radio"/> Automatic recording of changes | |
| <input type="radio"/> No changes allowed | |
| <input type="radio"/> Changes w/o automatic recording, no transports allowed | |
| Cross-Client Object Changes | |
| Changes to repository and cross-client customizing allowed | |
| Client Copy and Comparison Tool Protection | |
| Protection level 0: No restriction | |
| CATT and eCATT Restrictions | |
| eCATT and CATT Allowed | |

Figure 9.22 Assign the Logical System to a Client

3. Set up the RFC destination (Transaction SM59).

In this activity, you create a connection to the embedded PP-DS system (as created before), as shown in Figure 9.23. The name of the RFC destination has to match the name of the logical system exactly, which was already created in Figure 9.21.

The **Technical Settings** and **Logon & Security** tabs are used to maintain the system login information, which is used when data is integrated to the logical system.

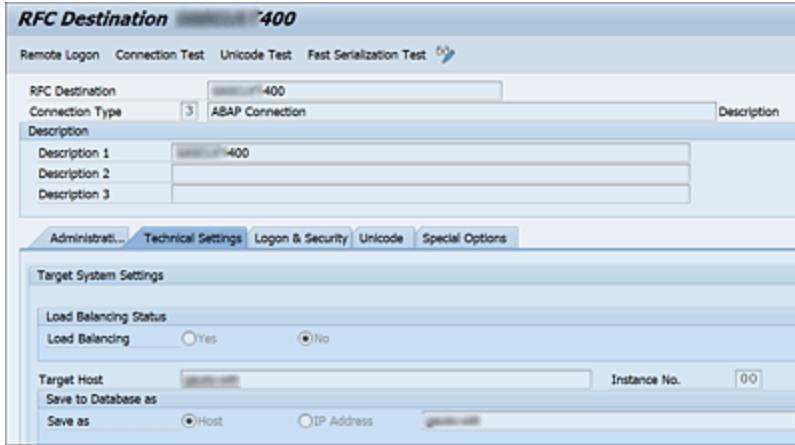


Figure 9.23 Set Up the RFC Destination

4. Maintain the business system group.

The assignment to a business system group guarantees that the same names are used for master data and their synchronization in distributed system landscapes (in our case, embedded PP-DS), as shown in [Figure 9.24](#).

| Change View "Business System Group": Overview | |
|---|-----------------------|
| | New Entries |
| | |
| Business System Group | |
| BusSystGrp | Description |
| BSG | Business System Group |

Figure 9.24 Maintain Business System Group

5. Assign the logical system and queue type.

Here, you enter the business system group (**BusSystGrp**) and

Logical system that are created and assign the Queue Type as Inbound Queue, as shown in [Figure 9.25](#).

| Change View "Assignment of Logical System to Business System Group": O | | | | | |
|--|----------------|----------|----------------|------------------------------|-----------|
| Assignment of Logical System to Business System Group | | | | | |
| BusSystGrp | Logical system | SAP Ind. | Release | Queue Type | Err. Hndg |
| B96 | 400 X | 700 | Inbound Queue. | Strict (Terminate at Errors) | |

Figure 9.25 Assign the Logical System and Queue Type

6. Specify the SAP Advanced Planning and Optimization release (Transaction NDV2 release).

Maintain the release level of the embedded PP-DS system. This setting ensures a logical system is found for the respective embedded PP-DS, PP-DS, and SAP IBP systems. This is important because otherwise CIF models can't be generated to integrate data to embedded PP-DS.

You can execute Transaction NDV2 or follow the Customizing menu path, **SAP IMG Menu • Integration with Other SAP Components • Basic Settings for Setting Up the System Landscape • Specify SAP APO Release**, to display and change the settings. Select the system type (**Syst.Type**), and enter “713” in the **Release** field, as shown in [Figure 9.26](#).

| Change View "Systems and Their Types and Releases": Overview | | |
|--|------------|-----------|
| New Entries | Log.System | Syst.Type |
| | 400 | SAP_APO |

Release

| Log.System | Syst.Type | Release |
|------------|-----------|---------|
| 400 | SAP_APO | 713 |

Figure 9.26 Specify SAP Advanced Planning and Optimization Release

[+] Note

If there are more systems to be integrated with SAP S/4HANA, for example, SAP Extended Warehouse Management and SAP IBP, each system should have a logical system created, and all the preceding settings must be done individually. Transaction NDV2

must be used for the assignments to run integration to these systems with SAP S/4HANA.

9.4.3 Data Transfer Settings

In this Customizing activity, you define the transaction data that can be transferred to the SAP S/4HANA embedded PP-DS component and vice versa. In other words, you can select or deselect, at the global level, the transactional data to be integrated and that is relevant to advanced planning.

[»] Note

With this Customizing, there's no need to run individual integration models for transactional data anymore except for purchasing info records, contracts, and scheduling agreements, as explained earlier.

Follow the Customizing menu path, **SAP IMG Menu • Advanced Planning • Basic Settings • Settings for Data Transfer**, to display

and change the settings in the advanced planning settings. The settings for data transfer are displayed in [Figure 9.27](#).

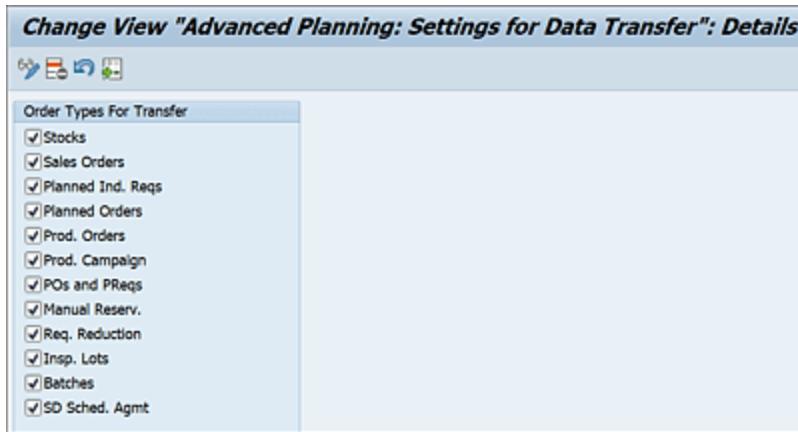


Figure 9.27 Settings for Transactional Data Transfer

9.4.4 Define Material Requirements Planning Areas for Subcontractors

In SAP S/4HANA, it's recommended to create an MRP area for each subcontracting vendor if you want to plan subcontracting in embedded PP-DS. MRP areas help to perform MRP separately for each MRP area (subcontractor). With embedded PP-DS, an MRP area for subcontractor needs to be defined with **MRP Area Type 3** for subcontractors, as shown in [Figure 9.28](#). Once created, the MRP

area must be transferred to embedded PP-DS by executing report /SAPAPO/CREATE_LOCATION for subcontracting MRP areas.

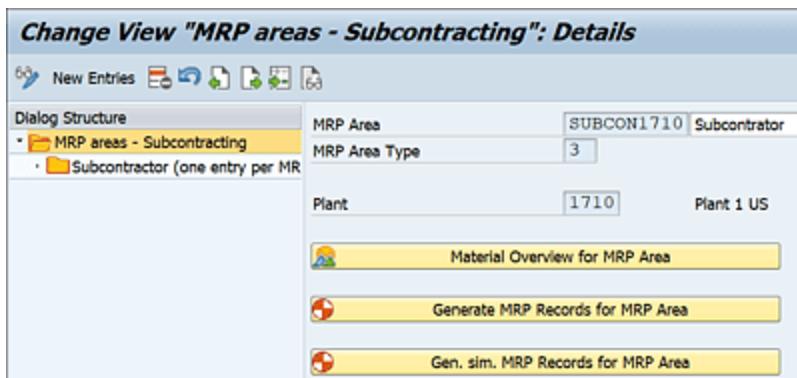


Figure 9.28 .28 Define the MRP Area for Subcontractors

To have specific master data fields for special procurement 30 (subcontracting), for example, lot size procedures, **Advanced Planning** view, and so on, you need to create a corresponding MRP area segment in the material master record. Follow the Customizing menu path, **SAP IMG Menu • Production • Material Requirements Planning • Master Data • MRP Areas • Define MRP Areas for Subcontractors**.

9.4.5 Global Settings

In global planning, you maintain the global parameters and default values for manual and automatic planning in embedded PP-DS. The system will only use these default values if there is no specified value maintained in the material master data or in any planning application.

You can execute Transaction /SAPAPO/RRPCUST1 or follow the Customizing menu path, **SAP IMG Menu • Advanced Planning • Global Settings • Maintain Global Parameters and Defaults**, to

display and change the default delivered settings in the embedded PP-DS global settings, as displayed in [Figure 9.29](#).

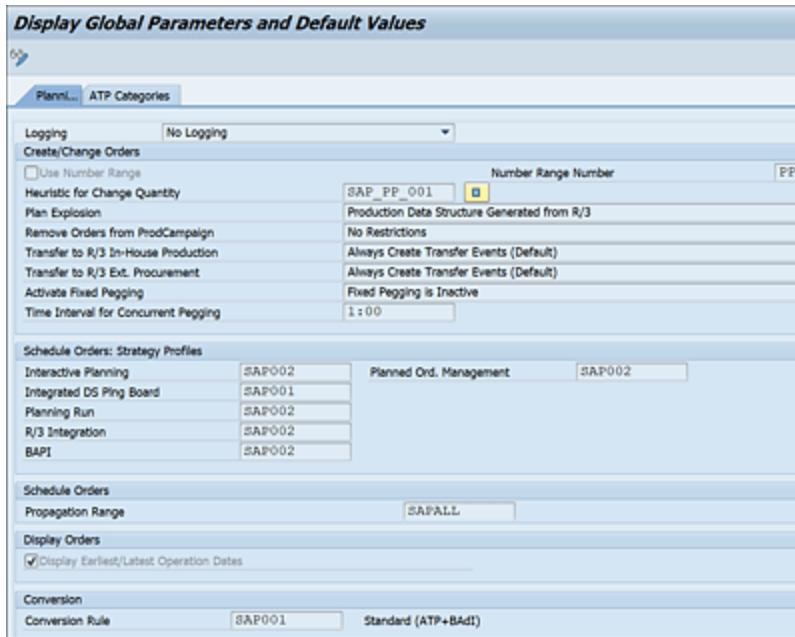


Figure 9.29 Maintain Global Parameters and Defaults

The embedded PP-DS global parameters are described in the following list:

- **Use Number Range**

If this is activated, the planned orders created in embedded PP-DS inherit the number range maintained in embedded PP-DS before it's integrated with the SAP ERP component. This is useful when you don't want to integrate planned orders but just production orders with SAP ERP.

- **Plan Explosion**

If no value is assigned in the **Advanced Planning** view of the material master, then in embedded PP-DS, the product master inherits the setting maintained in the global parameters.

- **Transfer to R/3 In-House Production/Transfer to R/3 Ext. Procurement**

Specifies if and when PP-DS automatically creates transfer events for planned orders (in-house production) or purchase requisitions (external procurement).

- **Activate Fixed Pegging**

By default, in integration, fixed pegging isn't active. There are three possible settings in fixed pegging: **Fixed Pegging is Inactive**, **Fixed Pegging is Active at Client Level**, and **Fixed Pegging is Active at Product Level**.

- **Schedule Orders: Strategy Profiles**

Specifies how the order scheduling takes place: when the orders are created in interactive planning, in the DS planning board, during the planning run job, and during integration with the SAP ERP component.

- **Conversion Rule**

Specifies the settings to be considered when converting planned orders to production orders and transferring to the SAP ERP component of SAP S/4HANA.

The next tab in global parameters and default settings is **ATP Categories**, as shown in [Figure 9.30](#). These settings map SAP S/4HANA-specific available-to-promise (ATP) categories (receipt and requirement) to the PP-DS specific categories. For example, a planned order is represented as category “PA” in the SAP ERP component of SAP S/4HANA, and depending on whether it's firmed, confirmed, or unconfirmed, has a corresponding category in embedded PP-DS.

In most cases, the standard delivered ATP categories are enough to execute the planning in embedded PP-DS, but if required,

customized categories can be created and assigned. These categories are limited to allowed changes only.

| Display Global Parameters and Default Values | | | | | | | |
|--|-----|---------------------------------------|--|----------------------|-----|-------------------------------------|--|
| Categories for PP/DS | | | | Requirement Elements | | | |
| Receipt Elements | | | | Requirement Elements | | | |
| Ext. Procurement | A9 | Purchase Requisition | | In-House Productn | AY | Dependent demand | |
| In-House Product | A1 | Planned order (not firmcd, unconfirme | | Sub.Cn. Punc Req. | A9 | Purchase Requisition | |
| In-house, w/o BOM | A1 | Planned order (not firmcd, unconfirme | | Sub.Cn. Punc Ord. | B9 | | |
| In-house, Firmcd | A1 | Planned order (firmcd, unconfirme) | | Sub.Cn. Sch. Line | B9 | Subco Scheduling Agreement Schedule | |
| In-HseProd.Cnfmd | A1 | Planned order (not firmcd, confirmed) | | | | | |
| InHseProdCrfd,Frmcd | A1 | Planned order (confirmed, firmcd) | | | | | |
| Stock Transfer | A9 | Purchase Requisition | | Stock Transfer | B9 | Stock transport requisition | |
| Stock Transfer Crf | B1 | Stock transport order | | Stock Transfer Crf | B1 | Stock transport order | |
| Product Substitute | A1 | Planned order (not firmcd, unconfirme | | Product Substitute | AY | Dependent demand | |
| Stock Trans. Res. | B1 | Stock transfer reservation | | Stock Trans. Res. | B1C | Stock transfer reservation | |
| Sch.Agr.: Ext.Proc | B1E | Scheduling Agreement Schedule Line | | Sch.Agr.: At Vendor | B1J | Supplier: SchedAgmmtRqmt | |
| Sch.Agr.: Release | B1V | Scheduling Agreement Release | | SA Rel. at Vendor | B1W | Supplier: Release Order Reqmt | |
| Sch.Agr.: Stk.Tran | B1E | Scheduling Agreement Schedule Line | | Sch.Agr.:Sup.Plant | B1J | Supplier: SchedAgmmtRqmt | |
| Sch.Agr.: Rel St Tr | B1V | Scheduling Agreement Release | | SA Rel. In SupPlant | B1J | Supplier: SchedAgmmtRqmt | |
| SA Conf. In Plant | H1A | Confirmation in Plant - SA | | SA Conf. at Vendor | H1B | Confirmation at Vendor - SA | |
| SSA Rel. at Cust. | H1D | Release at Customer - SD Sched. Agmnt | | SSA Rel. In Plant | H1C | Release from Customer in Plant - SD | |
| SSA Conf. at Cust. | H1F | Confirmation at Customer - SD SA | | SSA Conf. at Plant | H1C | Release from Customer in Plant - SD | |

Figure 9.30 Specify ATP Categories in Global Parameters for Embedded PP-DS

9.4.6 Specify Person Responsible (Planner)

A planner is responsible for planning a specific product location. This planner corresponds to the MRP controller used in SAP S/4HANA master data. In this step, you assign privileges to the planner along with creating the planner for embedded PP-DS, as shown in [Figure 9.31](#).

You can create the person responsible in PP-DS Customizing under the Customizing menu path, **SAP IMG Menu • Advanced Planning • Master Data • Specify Person Responsible (Planner)**.

The screenshot shows the SAP Change View "Person Responsible for a Product": Details. At the top, there is a field labeled "Planner" with the value "A01". Below this, a section titled "Person Responsible for a Product" contains a list of roles with checkboxes: Prod. Planner (checked), Purch. Planner, DRP Plnr, SC Analyst, Inventory Plnr, Forecast Planner, and Buyer. To the right of the list are three input fields: "Planner Name" with the value "Test planner", "Full name" with the value "Plannner 1", and "DL name" with an empty input field.

Figure 9.31 Specify Planner for Embedded PP-DS

9.4.7 Model Version Management

Finally, a planning version must be defined in embedded PP-DS. Embedded PP-DS only supports model 000, which is the default active model in the system. All the master data integrated from the SAP ERP component of SAP S/4HANA using the transfer programs with the **Advanced Planning** check activated is automatically assigned to model 000 (Active Version) in embedded PP-DS.

You can either execute Transaction /SAPAPO/MVM or follow the SAP menu path, **Logistics • Advanced Planning • Master data •**

Planning Version Management, to display and change the settings in embedded PP-DS, as shown in [Figure 9.32](#).

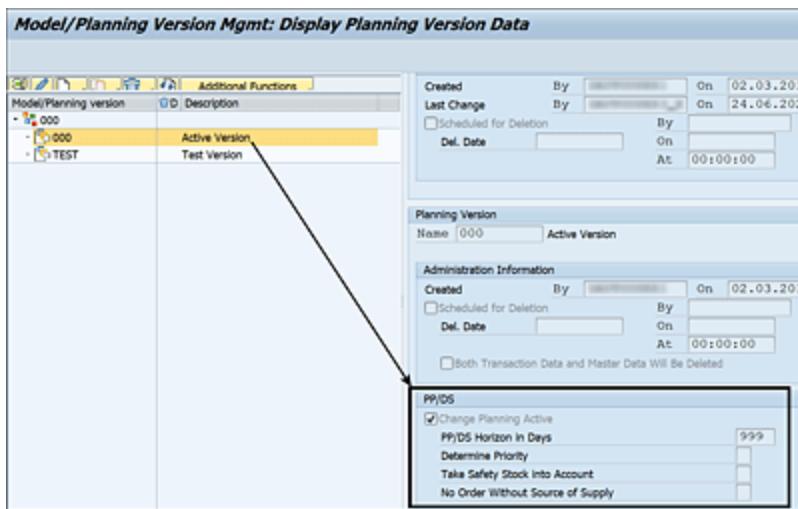


Figure 9.32 Create and Maintain Model Version Management in Embedded PP-DS

As of now you've created the master data and activated the critical products for advanced planning in embedded PP-DS. You've defined the production version and transferred it to embedded PP-DS. You've completed the required Customizing to transfer the master and transaction data from the SAP ERP component to embedded PP-DS and the required settings in embedded PP-DS to enable the transfer.

Now we'll look at the different functions available in PP-DS and their usage.

9.5 Advanced Planning with Production Planning and Detailed Scheduling

PP-DS comes with advanced planning features developed over the years by SAP based on various industries' inputs. Key features available in PP-DS are as follows:

- Production planning using advanced heuristics
- Constraint-based capacity planning
- Optimization using a cost-based model
- DS using the interactive DS planning board
- Industry-specific features such as model mix planning (MMP), characteristic dependent planning (CDP), and rapid planning matrix (RPM)

The following process flow in [Figure 9.33](#) shows a typical integrated planning process with PP-DS. It's a best practice process flow and

could change per business needs and the different tools used for planning.

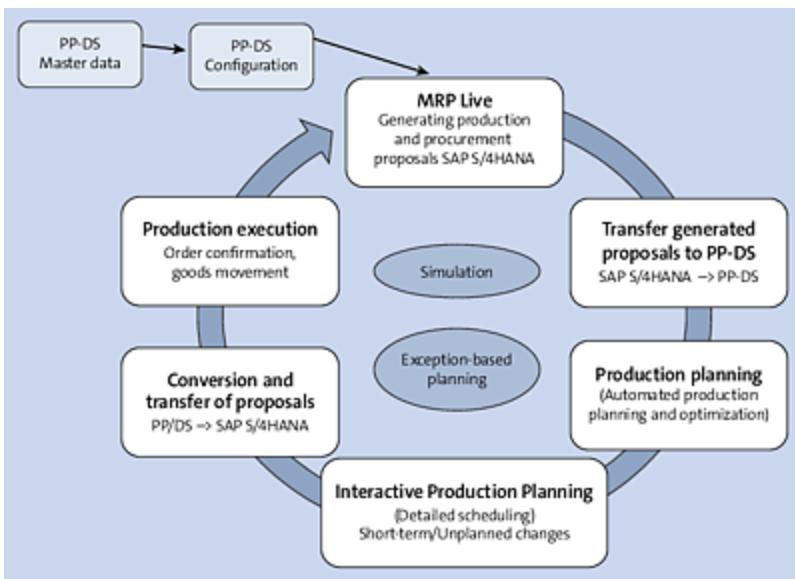


Figure 9.33 Planning Process with PP-DS

In the following sections, we'll cover the advanced planning process using PP-DS, including MRP Live runs, production planning runs, and interactive production planning.

[»] Note

Depending on the individual business scenario, some of the process steps may change or be realigned.

9.5.1 MRP Live

Master data and configuration are the inputs to a PP-DS run. As explained in [Section 9.3](#) and [Section 9.4](#), required master data for embedded PP-DS is created, and, with built-in integration, it's also available in embedded PP-DS. In addition, required configuration to execute PP-DS exists.

The next step of the planning process is to run MRP to generate proposals. Inputs for the MRP run are requirement elements, such as planned independent requirements (PIRs), customer orders, dependent requirements, or receipts from external planning systems, for example, SAP IBP.

Requirements in SAP S/4HANA are planned using MRP Live. As explained in [Chapter 4](#), the MRP Live logic is enhanced to recognize the materials planned in embedded PP-DS, to establish low-level code, and to plan all the dependent requirements correctly and per low-level code.

This reduces the requirement of a later MRP run to plan dependent requirements or, for example, C class materials in embedded PP-DS as done with classic SAP Advanced Planning and Optimization PP-DS. Let's look at the common planning process. As shown in [Figure 9.34](#), you have existing PIRs for material **TS422_FG100** in the embedded PP-DS Product View screen (Transaction /SAPAPO/RRP3) with a quantity of **150** pcs.



Figure 9.34 Product View in PP-DS

The MRP Live run is executed (can run in the background as well, depending on the job schedule to run MRP Live) with the parameters

as shown in [Figure 9.35](#). For descriptions of the parameters and their usage, refer to [Chapter 4, Section 4.5](#).

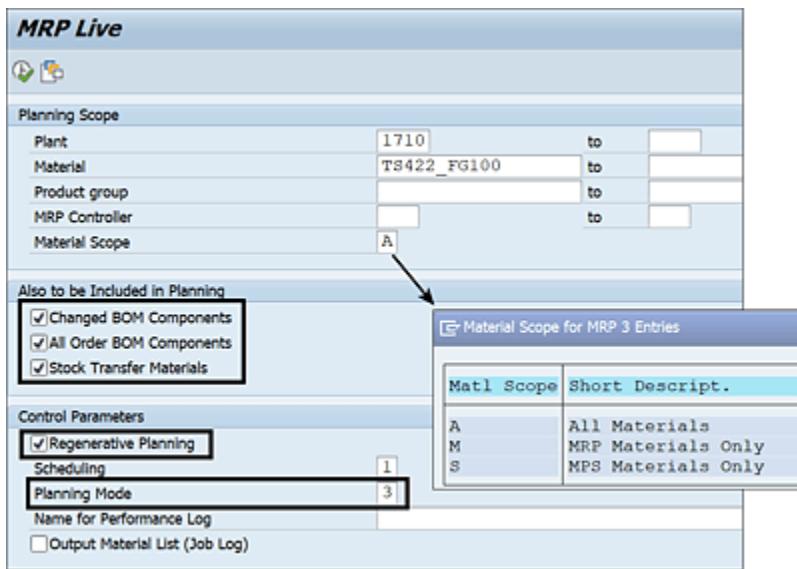


Figure 9.35 MRP Live Run

With built-in integration and order transfer configuration, after the MRP Live run, all the proposals from finished material to raw materials are generated and transferred to embedded PP-DS or synced between SAP S/4HANA and the embedded PP-DS component with reference to number ranges, which can be viewed

as shown in [Figure 9.36](#) and [Figure 9.37](#) in the embedded PP-DS Product View screen.

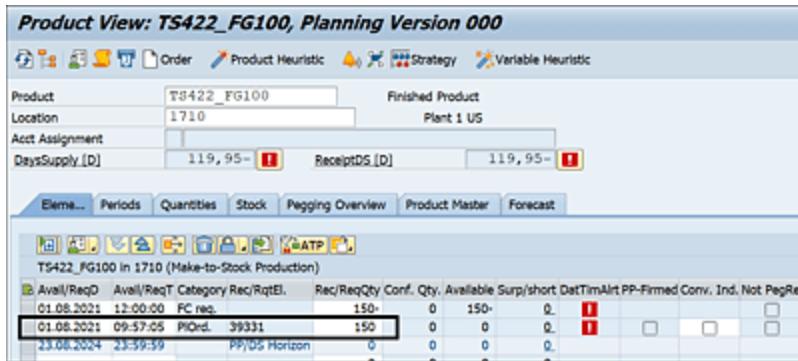


Figure 9.36 Product View with Finished Material Proposal in Embedded PP-DS

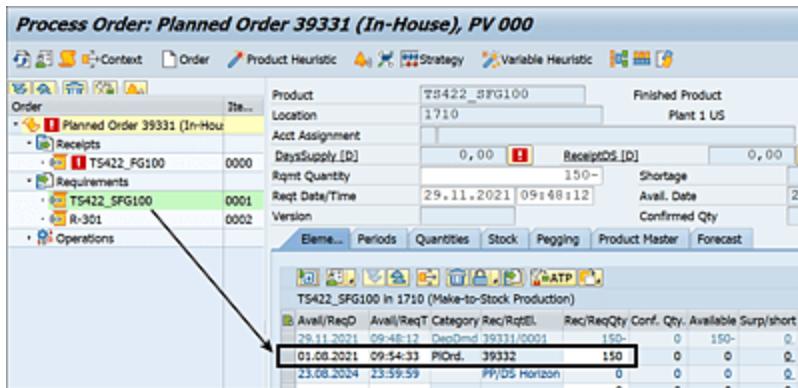


Figure 9.37 Product View with Subassembly Material Proposal

The PP-DS Product View screen is in some way similar to the Stock/Requirements List of SAP ERP, and the generated elements

can be viewed in Transaction MD04 (Stock/Requirements List) as well, pointing to the same order details and number ranges.

[+] Tip

MRP Live has embedded logic to plan materials with **Advanced Planning** activated by using the PP-DS planning of standard lots heuristic to create planned orders.

[»] Note

Planned orders are integrated between SAP S/4HANA and PP-DS only when the Customizing for planned orders is activated as explained in the “[Section 9.4.3 Settings](#)” section.

In such scenarios, where planned orders need not be integrated between SAP S/4HANA and PP-DS, the customizing data transfer must not be activated for planned orders, and the number range must be defined and assigned in the global settings in PP-DS. This ensures a planned order number is assigned to the newly created planned order in PP-DS.

9.5.2 Production Planning Run in Embedded Production Planning and Detailed Scheduling

Depending on the business case, a planning run can be executed in embedded PP-DS directly for finished goods and materials with a bottleneck operation. This is useful in cases where you first want to plan and schedule the finished goods, and then after the scheduling and leveling of orders is done in embedded PP-DS, execute planning for dependent materials in SAP ERP based on the

scheduled plan of embedded PP-DS. Another benefit of running planning in embedded PP-DS is its flexibility to run a number of planning steps in a sequence in one go.

To execute the planning run in embedded PP-DS, use Transaction /SAPAPO/CDPSB0 (Production Planning Run), or follow the path **SAP Menu • Logistics • Advanced Planning • Production Planning • Automated Production Planning and Optimization • /SAPAPO/CDPSB0 - Production Planning Run**.

As shown in [Figure 9.38](#), in the first **Step 01**, a standard heuristic is called to plan product (based on low-level code) and create planned orders based on requirements. [Figure 9.39](#) shows **Step 02**, in which a schedule sequence heuristic is called to schedule the orders based on the scheduling sequence defined in the heuristic's setting. This helps to plan and schedule the orders based on the available capacity in one single planning run. It's possible to execute up to 10

steps (if required) in embedded PP-DS using a production planning run.

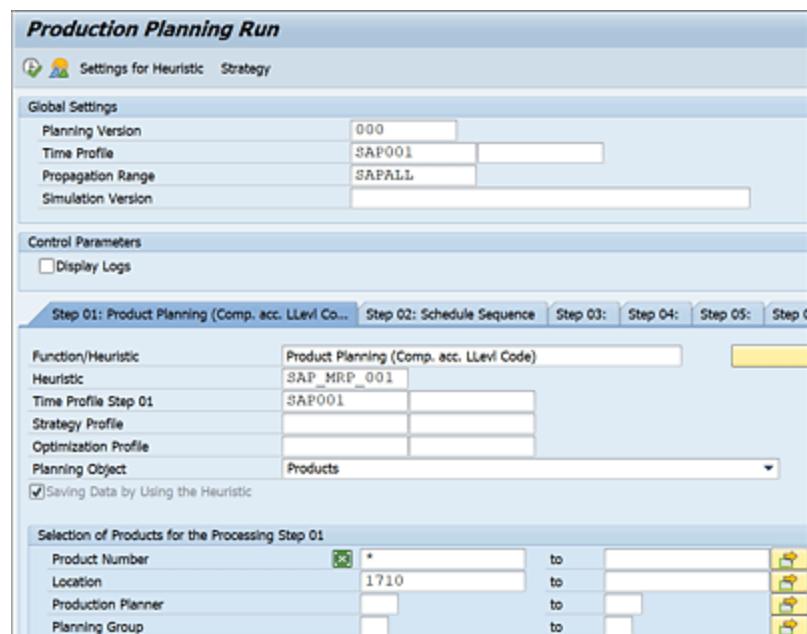


Figure 9.38 Step 01: Product Planning While Considering Low-Level Code

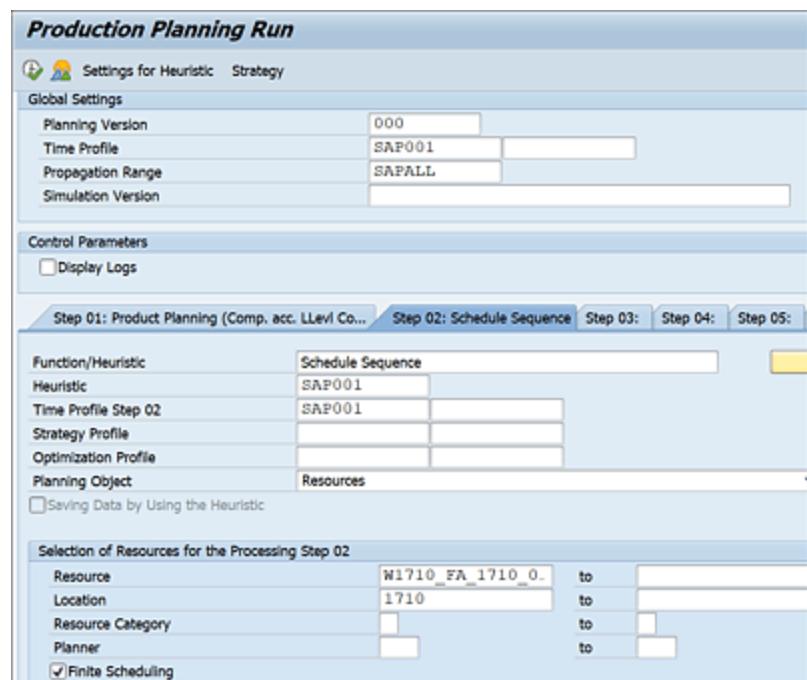


Figure 9.39 Step 02: Schedule Orders Generated Based on the Defined Scheduling Sequence

SAP provides a number of heuristics standard in the embedded PP-DS component of SAP S/4HANA. These heuristics can either be used as is or copied to make custom heuristics, for example, **Schedule Sequence based on (ZSAP001)**, as shown in [Figure 9.40](#).

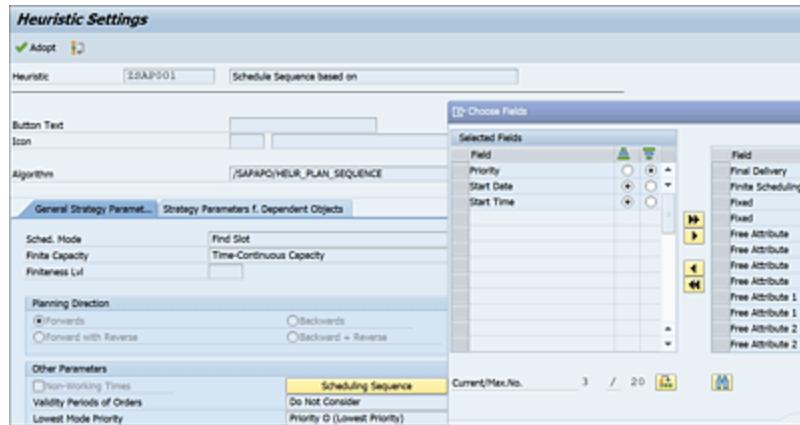


Figure 9.40 Custom Heuristic Creation with Sequence Fields Update

You can change or choose the fields and define a custom sequence, according to which the planned orders can then be prioritized and sequenced for production, considering available capacities.

Here are a few standard heuristics available in embedded PP-DS:

- **Reorder point planning (SAP_PP_007)**

This is the reorder point planning for location products. It creates procurement proposals if the available stock for a location product falls below the reorder point for the location product.

- **Quota heuristic (SAP_PP_Q001)**

This is used to plan products for which incoming quota arrangements are maintained in PP-DS.

- **Planning of Standard Lots (SAP_PP_002)**

This is used to execute procurement planning to cover product requirements. During procurement planning, the heuristic is able

to create new receipts and determine the procurement quantities. The heuristic uses the standard lot-sizing procedure and the lot-size settings from the location product master or from the heuristic settings.

To access standard heuristics available in PP-DS (see [Figure 9.41](#)), execute Transaction /SAPAPO/CDPSC11 or follow the path, **SAP IMG Menu • Advanced Planning • Heuristics • Maintain Heuristics**.

| Display Heuristics | | |
|--------------------|--|--------------------------------|
| Heuristic | Short Description | Algorithm |
| SAP001 | Schedule Sequence | /SAPAPO/HEUR_PLAN_SEQUENCE |
| SAP002 | Remove Backlog | /SAPAPO/HEUR_RESOLVE_BACKLOG |
| SAP003 | Schedule Sequence Manually | /SAPAPO/HEUR_PLAN_SEQUENCE_MAN |
| SAP004 | Minimize Runtime | /SAPAPO/HEUR_REDUCE_LEADTIME |
| SAP005 | Schedule Operations | /SAPAPO/HEUR_DISPATCH |
| SAP_CDPBP_01 | Reschedule Blocks | /SAPAPO/MC01_HEU_BLOCKS_SCHED |
| SAP_CDPBP_02 | Adjust and Reschedule Block Limits | /SAPAPO/MC01_HEU_BLOCK_ADJUST |
| SAP_CDPBP_03 | Enhanced Block Maintenance | /SAPAPO/BLRG_HEUR_BLK_MAINT |
| SAP_CDPBP_04 | Block Maintenance, Called Interactively | /SAPAPO/MC01_R05_RES_EDIT_HEUR |
| SAP_CDS_A01 | Admissibility OK Without Check | /SAPAPO/HEU_CDS_ADMI_OK_WO_CHK |
| SAP_CDS_A02 | Tolerance Check | /SAPAPO/HEU_CDS_TOLCHK_LCDDS |
| SAP_CDS_F01 | Confirm Compliance Without Check | /SAPAPO/HEU_CDS_MATCHING_CONF |
| SAP_CDS_F02 | Days' Supply Check | /SAPAPO/HEU_CDS_DSUP_CHK |
| SAP_CDS_F03 | Product Heuristic w. Days' Supply Check | /SAPAPO/HEU_CDS_PHEU_DSUP_CHK |
| SAP_CHECK_01 | Check PDS | /SAPAPO/CULL_PDS_CHECK_HEUR |
| SAP_DS_01 | Stable Forward Scheduling | /SAPAPO/SFW_HEUR_FW_STABLE |
| SAP_DS_02 | Enhanced Backward Scheduling | /SAPAPO/SFW_HEUR_BW_EXT |
| SAP_DS_03 | Change Fixing/Planning Intervals | /SAPAPO/HEUR_REL_FIXINT_MAINT |
| SAP_DS_04 | Activate Seq.-Dependent Setup Activities | /SAPAPO/HEUR_ACTIVATE_SETUPACT |
| SAP_INAC_01 | Firm Inactive Planned Orders | /SAPAPO/HEU_INAC_ORD_FIRM |
| SAP_INAC_02 | Unfirm Inactive Planned Orders | /SAPAPO/HEU_INAC_ORD_UNFIRM |

Figure 9.41 Maintain Heuristics Customizing

Scheduling a Production Planning Run in the Background

A production planning run can also be executed in the background by using Transaction /SAPAPO/CDPSB1 (Production Planning Run in the Background) or following the path **SAP Menu • Logistics • Advanced Planning • Production Planning • Automated Production Planning and Optimization • /SAPAPO/CDPSB1 - Production Planning Run in the Background**.

Follow these steps to execute the planning run in the background ([Figure 9.42](#)):

1. Run Transaction /SAPAPO/CDPSB1.
2. In the **Background Planning: Variants** screen, click the **Create Variant** button for the job, and enter the details of the planning steps as shown earlier in [Figure 9.39](#).
3. After the variant is created, select the variant, and click **Schedule** to schedule the background job.
4. Enter the scheduling period information in the subsequent screen.

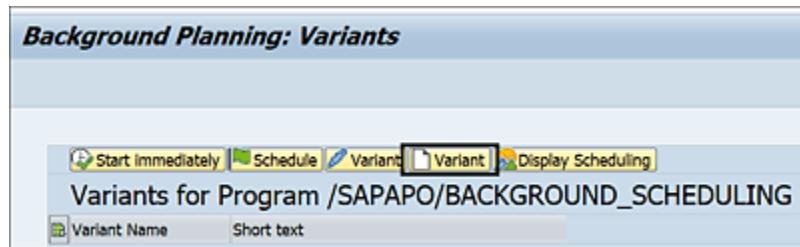


Figure 9.42 Background Job: Variant Creation and Job Scheduling

9.5.3 Interactive Production Planning

Interactive planning helps the planner and provides a quick planning view of the existing planning situation and the ability to perform a planning run or make adjustments. [Figure 9.43](#) shows the

transactions, which are helpful for planners in day-to-day planning work using PP-DS.

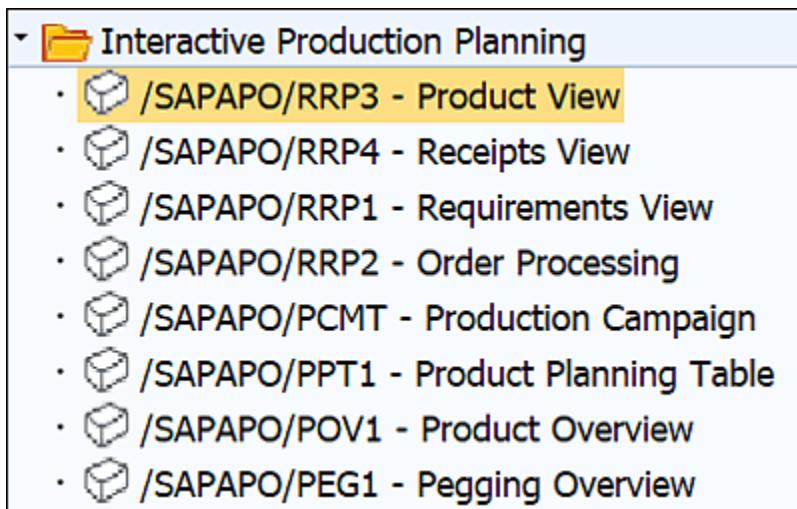


Figure 9.43 Interactive Production Planning

The **Product View** is a commonly used view that enables you to execute product heuristics or variable heuristics with the additional possibility to change lot size, strategy, planning direction, and so on before the planning run execution.

When the heuristic is executed in **Product View**, a dialog box appears where you can make the change to lot-size parameters. After execution, the planner can check the result of the heuristic without saving it. If satisfied, the planner can either proceed with saving or can choose to refresh to delete and revert back to the previous planning situation.

Figure 9.44 shows the Product View; click on the Change icon highlighted in the figure, which provides additional options as shown in Figure 9.45.

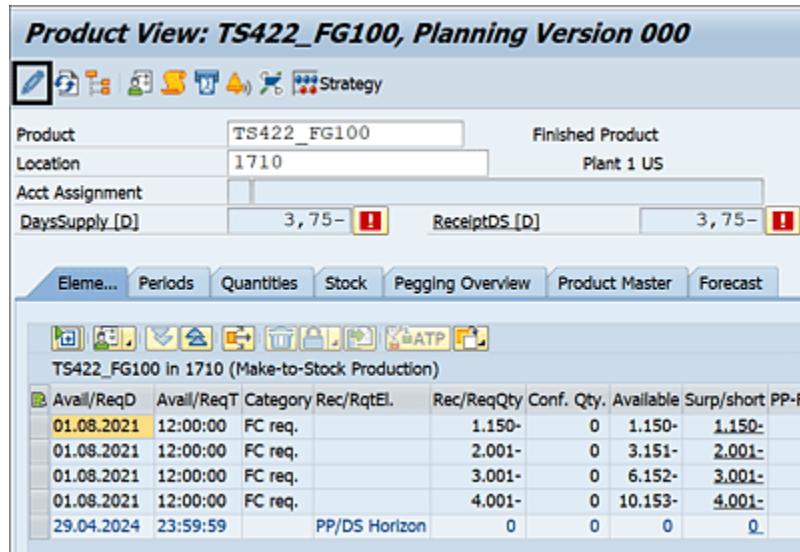


Figure 9.44 Product View: Change Icon

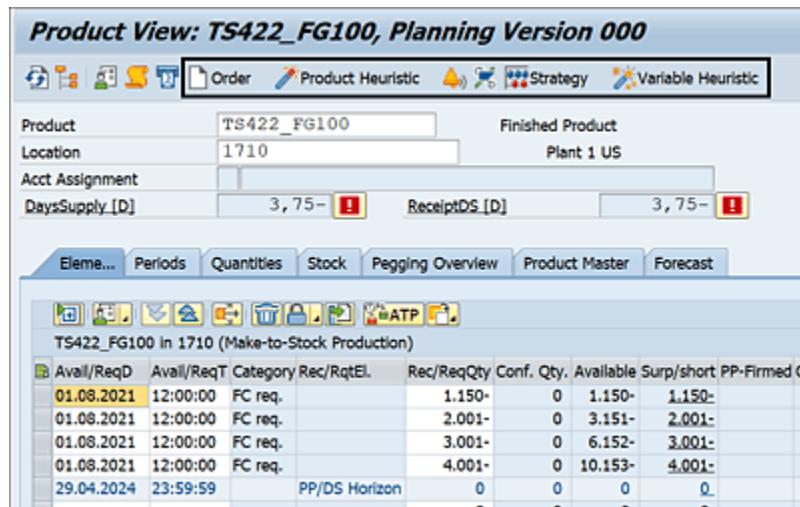


Figure 9.45 Change View: Heuristic Options

The planner can create a new order (**Order** button), run a **Product Heuristic**, or select **Variable Heuristic** to choose from the available heuristics for a specific heuristic run instead of a product heuristic.

After the product heuristic is executed, a popup appears that enables you to change the **Fixed Lot Size** (see [Figure 9.46](#)). Once adopted, the planning elements are generated.

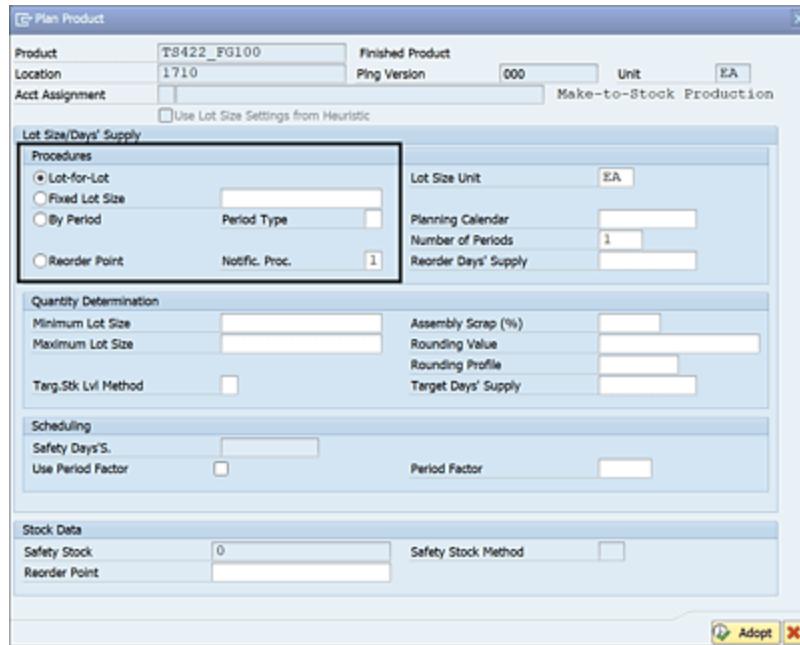


Figure 9.46 Plan Product: Change Lot Size

After the planning run, the planner can either save the result if satisfied or refresh to go back to the previous planning situation, as shown in [Figure 9.47](#).

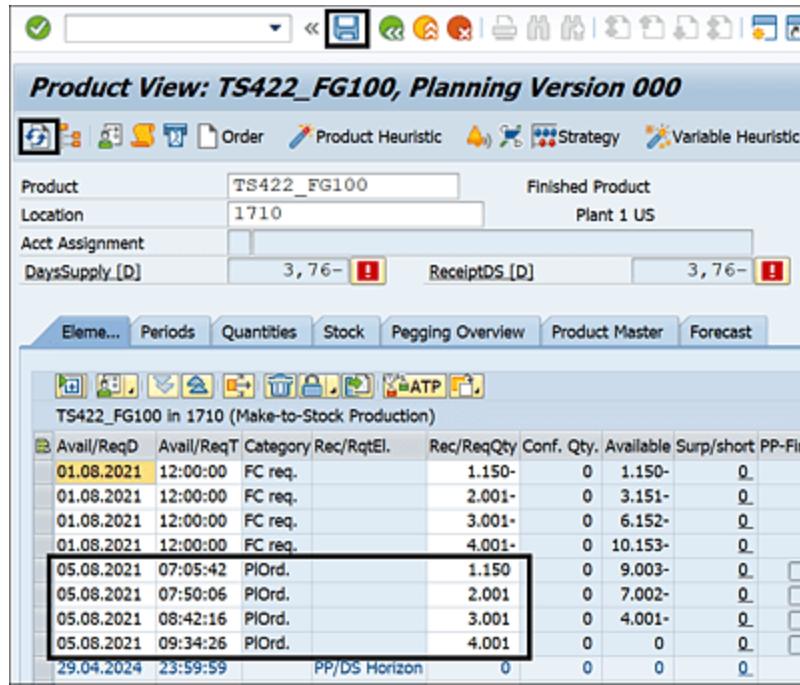


Figure 9.47 Planning (Simulated) Situation

9.6 Detailed Scheduling with Embedded Production Planning and Detailed Scheduling

After the supply network plan is established and the proposals are either published from (e.g., SAP IBP) or created directly in embedded PP-DS as an outcome of the planning process or using MRP Live, such proposals are then scheduled and sequenced in embedded PP-DS. By considering available resource capacities and using advanced algorithms, a detailed production plan is created.

DS is used to determine the required times for carrying an operation, balancing it with the available capacity of the resource and at the same time following constraints defined in the planning run. During DS priority, sequencing, and so on, logics are taken into consideration if defined.

The following activities are involved in DS:

- Performing order dispatching, which is scheduling the orders on the resource while considering the defined strategy
- Rescheduling the already scheduled orders, either by using scheduling heuristics or using the drag-and-drop function
- Deallocation of the orders, that is, removing orders scheduled from resources, thus making the resources free for other orders

A typical planning and scheduling process has the steps shown in [Figure 9.48](#).

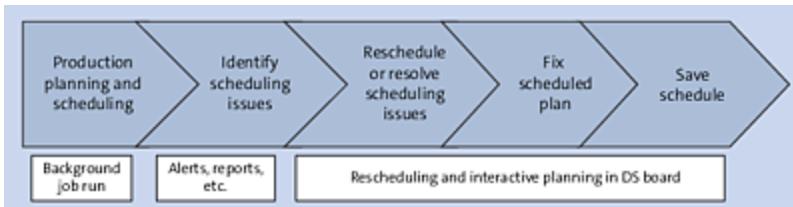


Figure 9.48 Production Planning in PP-DS

When the planning run is executed, the system schedules the orders automatically in the resource and creates a resource load if a valid PDS is found for the location product. For an infinite planning run, the load can be more than 100%. These orders can then either be scheduled using a background planning run with scheduling heuristics or in the DS board using scheduling heuristics interactively. DS can be achieved by using scheduling and leveling heuristics or the Optimizer function. We'll cover the prerequisites for DS, along with examples of scheduling, conversion and transfer of orders, and the simulation version in this section.

9.6.1 Prerequisites for Detailed Scheduling

To execute DS using the DS board, some prerequisites must be maintained in embedded PP-DS, for example, finite planning-relevant resource master data, source of supply (PDS) with activity time, operation relationships, and work center priorities. In addition, the DS strategy must be defined, which derives the scheduling and sequencing process in embedded PP-DS. The following describes these prerequisites:

1. DS strategy

The DS strategy helps to define the rules and constraints that the system must use when resources are planned and orders

are scheduled. To create a new strategy, use the following path:
SAP IMG Menu • Logistics • Advanced Planning • Detailed Scheduling • Maintain Strategy Profiles.

As shown in [Figure 9.49](#), **Sched. Mode** defines how the system schedules or reschedules a selected operation for a resource. The orders must be infinitely scheduled (no capacity constraint considered) or finitely scheduled using, for example, **Find Slot** mode or **Insert Operation** mode.

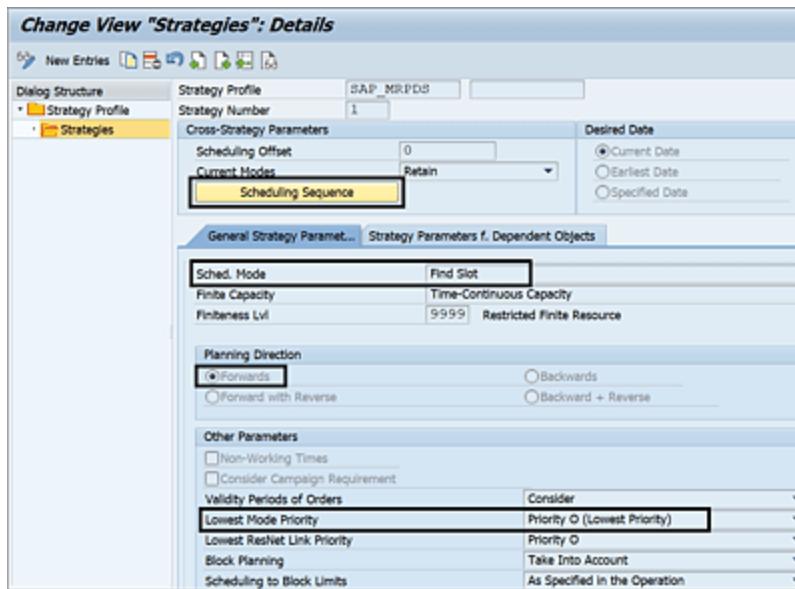


Figure 9.49 General Strategy Parameters in the Detailed Strategy Profile

Scheduling Sequence is used to specify in which sequence the system executes the scheduling or rescheduling of an operation, for example, order priority, product number, or a configured/developed attribute.

Planning Direction determines in which direction the order scheduling must occur. The example in [Figure 9.49](#) shows the orders will be scheduled in the forward direction.

The following planning directions options are available:

- **Forwards**
- **Backwards**
- **Forwards with Reverse**
- **Backwards + Reverse**

Lowest Mode Priority lets the system know that, in case of alternate resource usage (i.e., a product can be produced on more than one resource), the resource with mode **Priority A** in the PDS is scheduled first, then resource with mode **Priority B**, and so on. **Priority O (Lowest Priority)** in [Figure 9.49](#), defines that up to mode priority O, the sequence rule must be followed.

The next tab, **Strategy Parameters f. Dependent Objects**, in the detailed strategy (see [Figure 9.50](#)) focuses more on the dependent activities and relations, for example, **Sched.**

Submode, to schedule dependent operations according to the scheduling mode. The following options are available:

- **Schedule Dependent Operations According to the Scheduling Mode:** The system performs scheduling on the dependent resources with the same scheduling mode as on the selected resources.
- **Deallocate Dependent Operations:** The system deallocates the dependent operations.
- **Schedule Dependent Operations Infinitely:** The system schedules all dependent operations on the dependent resources infinitely.
- **Find Slot in Scheduling Mode “Find Slot”, Otherwise Infinite:** The system schedules the dependent operations with the **Find Slot** finite scheduling mode, if it's defined as the scheduling mode for the superordinate operations. If you've

defined a different scheduling mode for the superordinate operations, the system schedules the dependent operations infinitely.

Order-Int. Rel. depicts whether the internal operation dependency must be considered while scheduling or not. With this, if maximum or minimum intervals are defined in routing operations, these are considered.

Cross-Order Rel defines whether the cross-order dependency (relevant for subcontracting) must be considered or not.

Pegging information defines whether the system must consider the fixed pegging relationships to the other dependent objects or not.

2. Resources (bottleneck)

DS considers the capacity available and finitely schedules orders if the resource is to be finitely scheduled. The **Finite Scheduling** indicator shown in [Figure 9.51](#) defines whether the

resource is a bottleneck resource and must be finitely planned or infinitely planned.

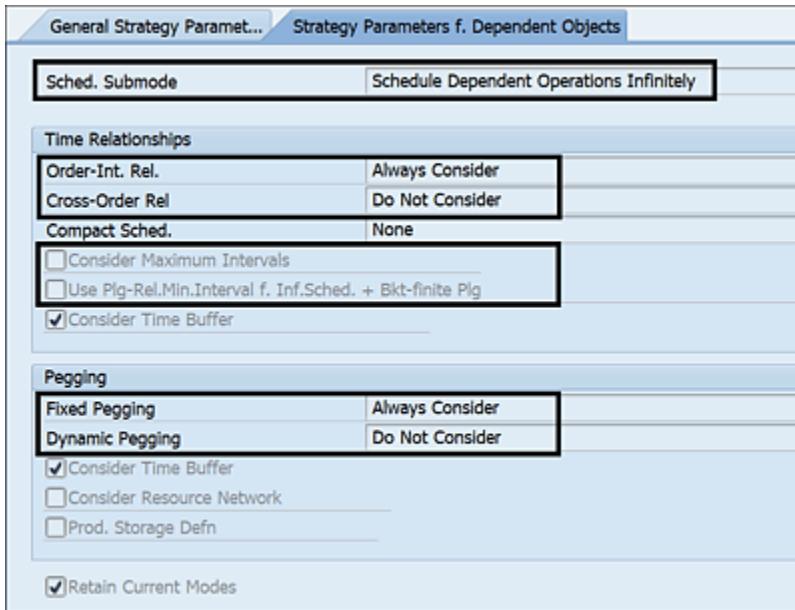


Figure 9.50 Strategy Parameters for Dependent Objects

| Display Resources: Header Data - Planning Version 000 | | | | | | | | | |
|---|---------|------------------|------------|------|------------------|---------------|--|--|--|
| | | | | | | | | | |
| 0 Sin... | 1 Multi | 0 Production Lin | 0 Calendar | | | | | | |
| Resource | Cat | Location | Time Zone | C... | Factory Calendar | Planner Gr... | | | |
| W1710_FA_1710_001 P | 1710 | PST | | W8 | A | | | | |

Figure 9.51 Finite Scheduling Indicator in the Resource

3. Source of supply (PDS or procurement relation)

It's mandatory for master data to find the resource on which the order will be scheduled and provide the necessary operation information from routing, for example, operations dependencies (relationships), mode priority, minimum/maximum, time-interval, and setup and processing time.

In the model/planning version management, you can define whether an order without a source of supply can be created or

not. As shown in [Figure 9.52](#), there are four options to choose from.

If you set this indicator, the system doesn't create an order for a product in PP-DS if there is no valid source of supply. If you don't set the indicator, the system creates an order without requirements and operations in case a valid source of supply can't be found for a product.

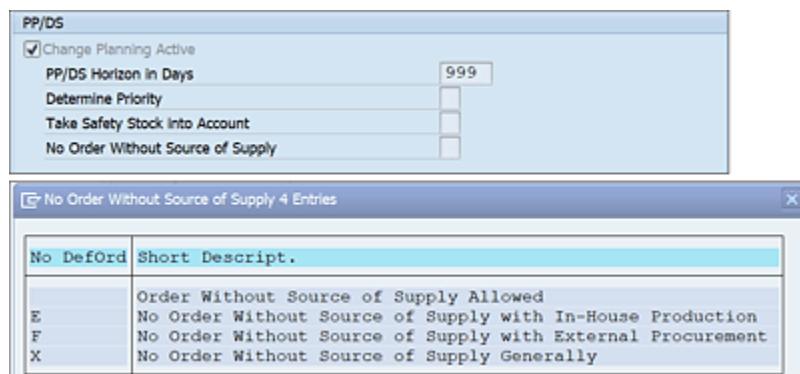


Figure 9.52 Model Version Management: Order without Source of Supply

9.6.2 Scheduling with the Detailed Scheduling Planning Board

SAP provides a comprehensive DS planning board (DS board) , which is highly customizable. The DS planning board provides a graphical representation of the planning situation and helps to plan interactively to resolve the issues. In addition, the DS board provides a network view and fix of the final plan. As shown in [Figure 9.53](#), an overall profile can be customized to get the desired set of profiles as explained next.

An **Overall Profile** consists of the following:

- **DS Strategy Profile**

As explained in [Section 9.6.1](#), the strategy profile created is assigned to an overall profile to ensure that the strategy definition

is considered when scheduling functions are used in the DS board.

- **PP Strategy Profile**

The strategy profile definition is used when the production planning functions are used, such as create and change order quantities in the DS board.

- **Planning Board Profile**

You define the structure of the DS board and the selection and display of the objects to be displayed, for example, number of charts, visible columns and their sort sequence, color of the bars, text and order information to be shown inside/outside of the bar, and so on.

- **Work Area**

This determines the resources, products, and orders to be displayed in the DS planning board.

- **Time Profile**

This is the planning period and display horizon in the DS board.

- **Optimization Profile**

When using the Optimizer, the optimization profile specifies the settings for the optimization in PP-DS.

- **Heuristic Profile**

This is a set of heuristics that a planner can call in the DS board for interactive planning and scheduling.

- **PP/DS Alert Profile**

When assigned, an alert profile provides user-specific alerts based on the alert profile definition.

- **Propagation Range**

This specifies which resources and products you or the system can plan in PP-DS.

- **Key Figure Schema**

You specify the criteria according to which the planning is to be evaluated.

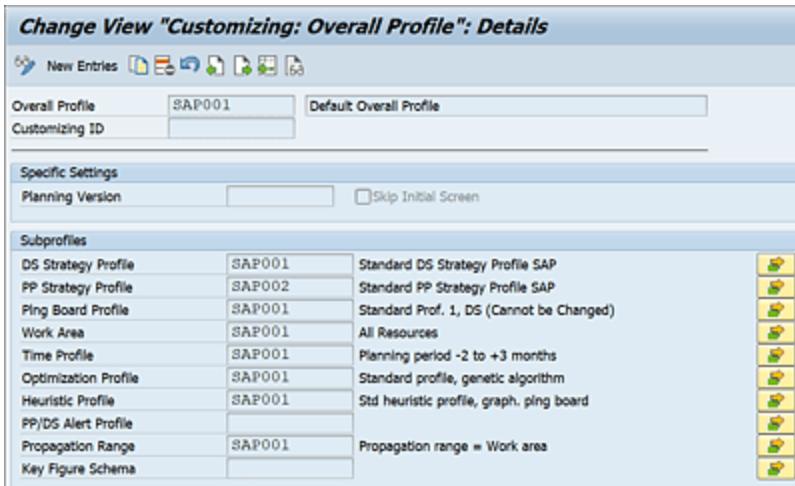


Figure 9.53 Overall Profile for the DS Board

The DS planning board in embedded PP-DS can be called using Transaction /SAPAPO/CDPS0 or by following the path **SAP Menu • Logistics • Advanced Planning • Production Planning • Interactive Production Planning • Detailed Scheduling • Detailed Scheduling Planning Board - Variable View.**

After entering the overall profile in the DS board, based on the profiles assigned in the overall profile, all the relevant information is

filled in, as shown in [Figure 9.54](#). To have a quick view of all the assigned profiles, click on **Profiles**

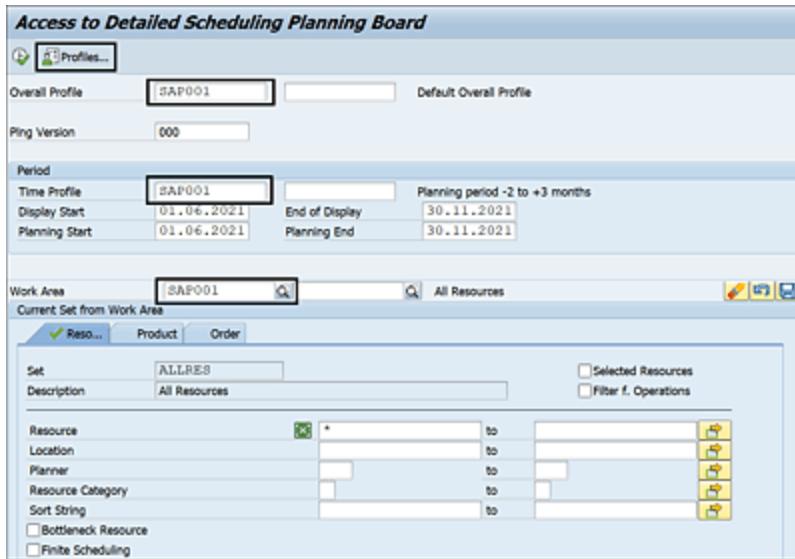


Figure 9.54 Access to the DS Planning Board

A DS planning board profile shows (see [Figure 9.55](#)) that only the **Resource Chart**, **Product Chart**, and **Product Stock** chart will be displayed. You can select the chart you don't want to display by selecting the **No Display** checkbox.

| DS Planning Board Profiles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------------------------------|-----------|----------------------------|------------|------------|--------|-------------------|---|-------------------------------------|----------|-------------------|---|-------------------------------------|---------|-----------------|---|-------------------------------------|-------|----------------|---|-------------------------------------|-----------|--------------------|---|-------------------------------------|----------|------------------------|---|-------------------------------------|---------|-----------------|---|-------------------------------------|-----------|----------------------------|---|-------------------------------------|-------|------------------------|
| Ping Board Prof... DS Strategy Profile Heuristic Profile More Profiles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ping Board Prfl | | SAP001 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Customizing ID | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard Prof. 1, DS (Cannot be Changed) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>ChartNumbr</th> <th>No Display</th> <th>Object</th> <th>Short Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><input checked="" type="checkbox"/></td> <td>Resource</td> <td>▼ Resources Chart</td> </tr> <tr> <td>2</td> <td><input checked="" type="checkbox"/></td> <td>Product</td> <td>▼ Product Chart</td> </tr> <tr> <td>3</td> <td><input checked="" type="checkbox"/></td> <td>Order</td> <td>▼ Orders Chart</td> </tr> <tr> <td>4</td> <td><input checked="" type="checkbox"/></td> <td>Operation</td> <td>▼ Operations Chart</td> </tr> <tr> <td>5</td> <td><input checked="" type="checkbox"/></td> <td>Resource</td> <td>▼ Resource Utilization</td> </tr> <tr> <td>6</td> <td><input checked="" type="checkbox"/></td> <td>Product</td> <td>▼ Product Stock</td> </tr> <tr> <td>7</td> <td><input checked="" type="checkbox"/></td> <td>Operation</td> <td>▼ Network View: Operations</td> </tr> <tr> <td>8</td> <td><input checked="" type="checkbox"/></td> <td>Order</td> <td>▼ Network View: Orders</td> </tr> </tbody> </table> | | | | ChartNumbr | No Display | Object | Short Description | 1 | <input checked="" type="checkbox"/> | Resource | ▼ Resources Chart | 2 | <input checked="" type="checkbox"/> | Product | ▼ Product Chart | 3 | <input checked="" type="checkbox"/> | Order | ▼ Orders Chart | 4 | <input checked="" type="checkbox"/> | Operation | ▼ Operations Chart | 5 | <input checked="" type="checkbox"/> | Resource | ▼ Resource Utilization | 6 | <input checked="" type="checkbox"/> | Product | ▼ Product Stock | 7 | <input checked="" type="checkbox"/> | Operation | ▼ Network View: Operations | 8 | <input checked="" type="checkbox"/> | Order | ▼ Network View: Orders |
| ChartNumbr | No Display | Object | Short Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | <input checked="" type="checkbox"/> | Resource | ▼ Resources Chart | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | <input checked="" type="checkbox"/> | Product | ▼ Product Chart | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | <input checked="" type="checkbox"/> | Order | ▼ Orders Chart | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | <input checked="" type="checkbox"/> | Operation | ▼ Operations Chart | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | <input checked="" type="checkbox"/> | Resource | ▼ Resource Utilization | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | <input checked="" type="checkbox"/> | Product | ▼ Product Stock | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | <input checked="" type="checkbox"/> | Operation | ▼ Network View: Operations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | <input checked="" type="checkbox"/> | Order | ▼ Network View: Orders | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 9.55 Charts Selected for Display Based on the DS Planning Board Profile Setup

The next profile tab in the DS planning board profile displays the settings for the DS strategy profile, as shown in [Figure 9.56](#).

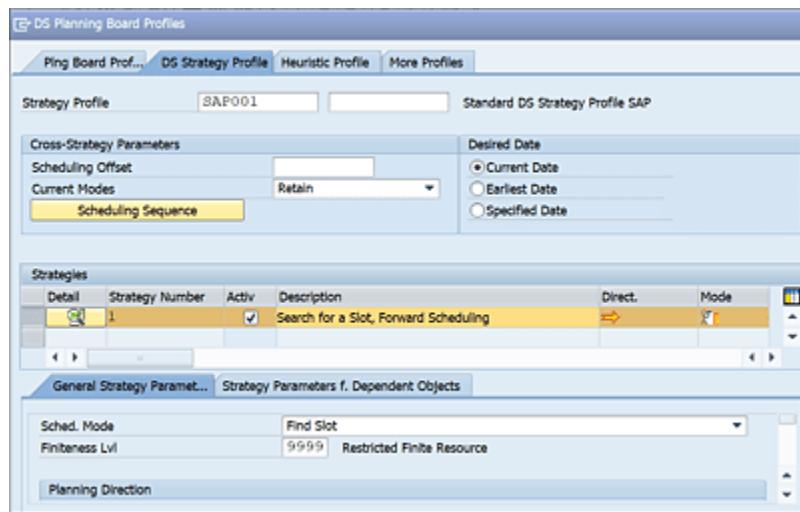


Figure 9.56 DS Strategy Profile

A heuristic profile gives a quick view to the heuristics, which can be called in the DS board interactively ([Figure 9.57](#)).

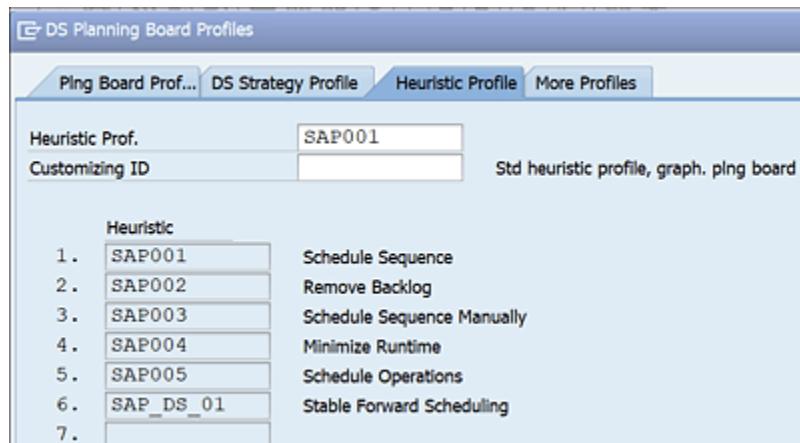


Figure 9.57 Heuristic Profile Assigned to the Overall Profile

In the **More Profiles** tab, **PP Strategy Prof.**, **Time Profile**, **Optimzn Profile**, **Alert Profile**, and **Prop. Range** are shown (see [Figure 9.58](#)).

After the DS board is executed based on the selection of resources, products, and finite scheduling, the charts with order information are displayed. As shown in [Figure 9.59](#), there are many navigation options that a planner can use. For example, **Zoom In/Out**, **Selection**, **Scheduling Mode (Forward/Backward)**, **Mode (Insert Operation/Find Slot)**, and so on.

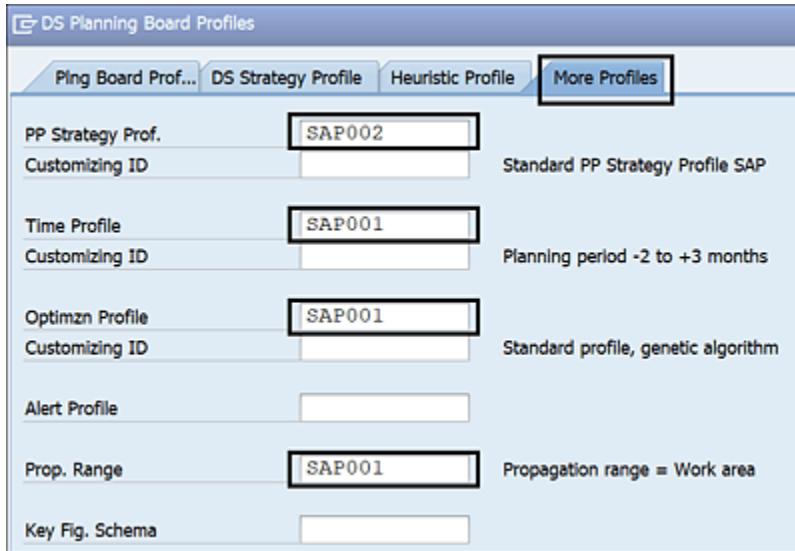


Figure 9.58 More Profiles View of the Overall Profile of the DS Board

You can see in [Figure 9.59](#) that the orders created in production planning aren't finitely scheduled or sequenced because they were created and planned considering infinite capacity.

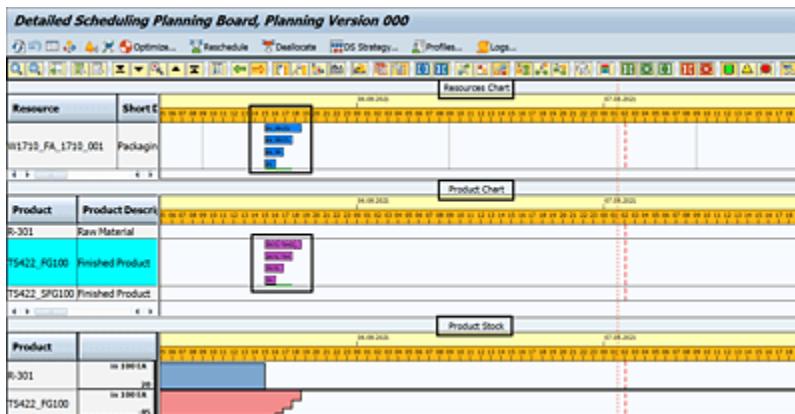


Figure 9.59 DS Planning Board

Using the sequence heuristic, a planner can select the resource to be planned and the order to be sequenced on the resource. The planner can also use drag and drop to move the orders as needed. Select the **Resource** to be scheduled, and then click **Functions • Heuristics** to select the scheduling heuristic to be used, as shown in [Figure 9.60](#).

To use the optimizer, select **Functions • Optimize** from the navigation and execute. The main purpose of the PP-DS optimizer is to create a mathematical model of the scheduling problems based on the defined notional cost, that is, to reduce the make-span (lead time) of the order, setup time, setup cost, delay cost, and mode cost, while considering all of the constraints.

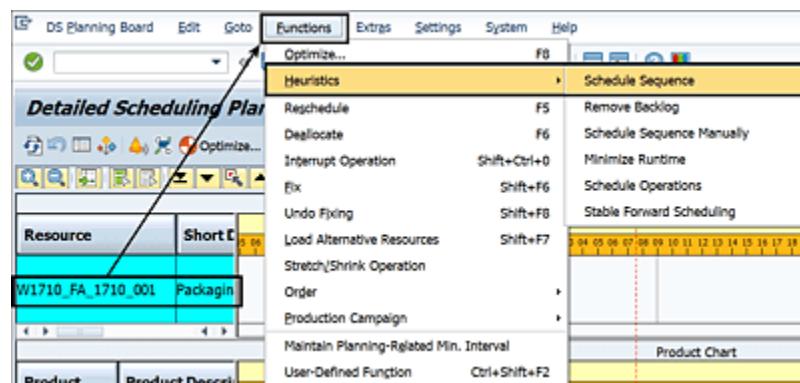


Figure 9.60 Executing Scheduling Heuristics in the DS Board

After the scheduling sequence runs, because the DS strategy has **Planning Direction** set as **Forward** and the **Desired Date** as **Current Date**, orders from the past are moved to the current date and scheduled in sequence as desired ([Figure 9.61](#)). There is no

overload on resources as orders aren't produced in parallel like the situation before the scheduling run.

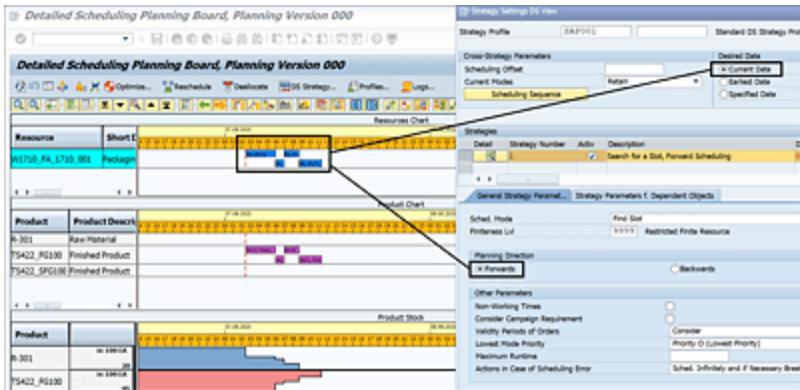


Figure 9.61 Order Sequencing in the DS Board

After the planner is satisfied with the results, the order can either be fixed individually or by using a fixing interval. Fixing orders make sure that new PP-DS runs won't delete/change the fixed plan created. [Figure 9.62](#) and [Figure 9.63](#) show how a fixing interval can be set. An individual order can be fixed by right-clicking on the respective order and choosing **Fix**. If an order is fixed, the **Date Fixed** indicator appears in the order view; for interval fixing, on the other hand, the interval is fixed, and the **Date Fixed** indicator doesn't appear.

A **Date Fixed** order in the DS board has a legend of a red bar over blue, whereas an **Interval Fixing** order is visible as an orange color

in the background of orders for the time interval, as shown in [Figure 9.64](#).

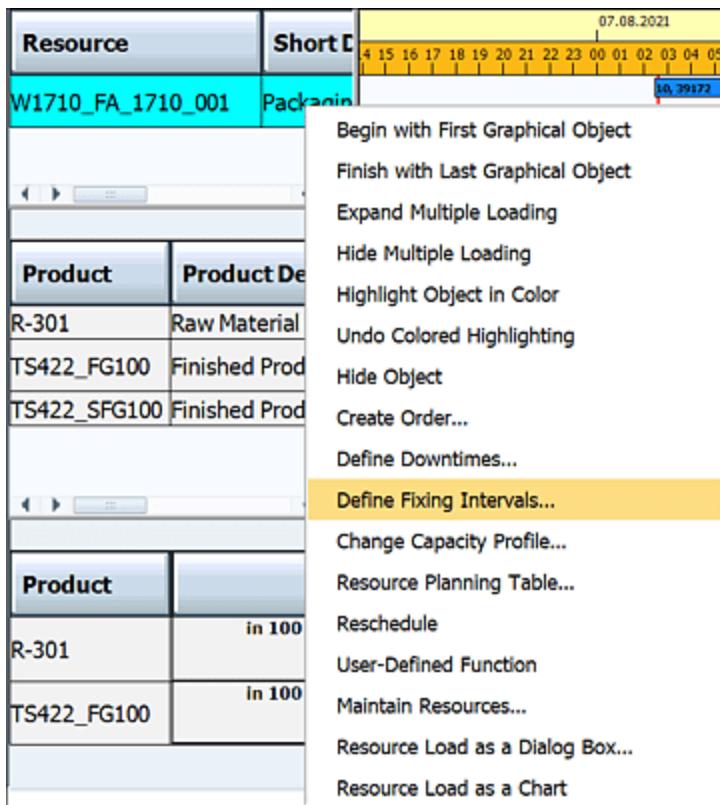


Figure 9.62 Select Fixing Interval for Orders on a Resource

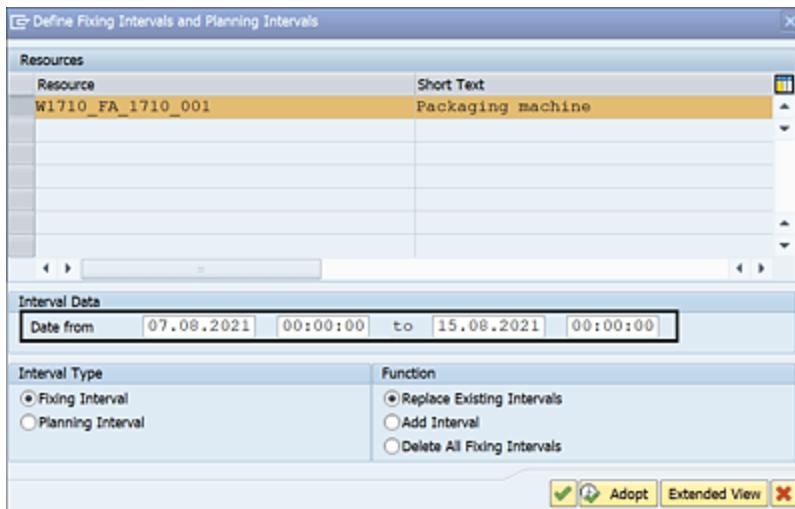


Figure 9.63 Enter Fixing Interval

After fixing the interval in the DS board, all orders on the resource are fixed, and the chart color for the fixing period changes, as shown in [Figure 9.64](#).

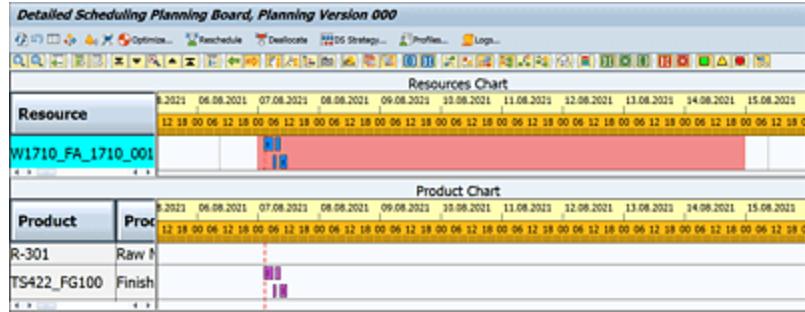


Figure 9.64 Fixed Interval in the DS Board

To save the planning result, you must adopt the results ([Figure 9.65](#)).



Figure 9.65 Saving the DS Board Results

9.6.3 Conversion and Transfer of Orders to Production Execution

Orders planned and scheduled in PP-DS are recommended to be converted from planned orders to production orders in PP-DS to maintain the scheduling of PP-DS.

Conversion of orders can be done interactively in the **Product View** screen if an urgent order needs to be expedited, and mass conversion and transfers of orders can be executed or scheduled as jobs (see [Figure 9.66](#)).

Converted orders are visible in **Product View** in PP-DS and in the **Stock/Requirement List** view of SAP S/4HANA as production orders.

[»] Note

This step is only valid for customers working with production orders.

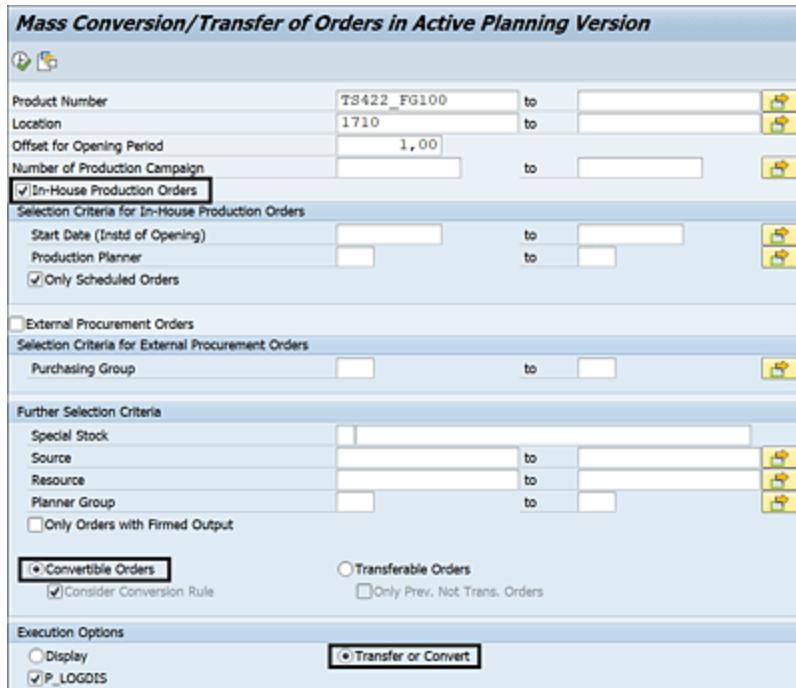


Figure 9.66 Mass Conversion/Transfer of Orders in PP-DS

9.6.4 Simulation

A simulation version can be used to run advanced planning and scheduling functions, analyze, and then take the necessary actions. A simulation version of the DS board outcome can be saved by entering a simulation version name. This simulation version can be called using Transaction /SAPAPO/CDPSS0 for analysis, and if the

results are found satisfactory, it can also be promoted to the active version.

As shown in [Figure 9.67](#), **Simulation Version 0001** can be adopted, or it can be reopened to run further scheduling functions. In the end, the simulation version can be adopted to promote the changes to active version.

| Simulation Version | | | | | | | |
|--|--|--------------------------------|-------------------------------|---------------------------------|-----------------|-------------|------------|
| <input type="checkbox"/> Process in Graphic Form | <input type="checkbox"/> Process in Tabular Form | <input type="checkbox"/> Adopt | <input type="checkbox"/> Copy | <input type="checkbox"/> Delete | | | |
| Simulation Version | Ping Version | Sim. Version Owner | Created on | Creation time | Last Changed By | Change date | Changed at |
| 0001 | 000 | GAUTDUSER3_B | 07.08.2021 | 03:25:27 | | | 00:00:00 |

Figure 9.67 Simulation Version

9.7 Alert Monitor

You use Alert Monitor to identify any issues, so that a necessary action can be taken to rectify those issues. Alert Monitor is a powerful tool for identifying, monitoring, and managing exception situations in the planning and scheduling processes.

To do this, a PP-DS alert profile needs to be created, which specifies in what situations the system reports the problem or generates an alert. An alert profile can be assigned to the overall profile in the DS board to enable the planner to call up the Alert Monitor and check the issues.

When the Alert Monitor is called directly, the system displays all the alerts determined according to the selected overall alert profile, as shown in [Figure 9.68](#). The overall alert profile determines all the alerts in the plant, including semifinished materials.

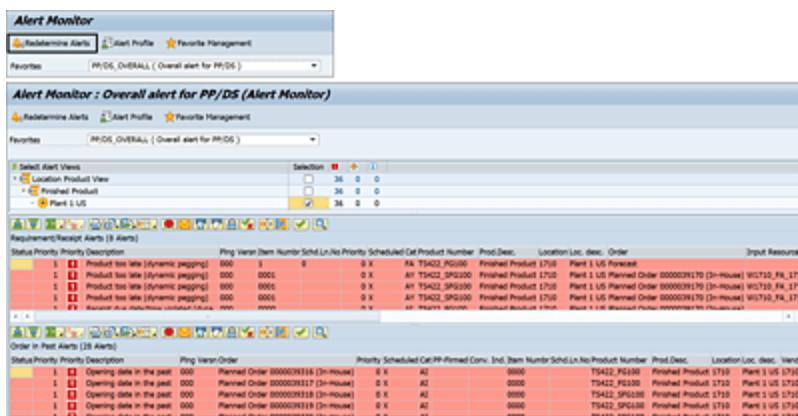


Figure 9.68 Overall Alerts for PP-DS (Alert Monitor)

If the Alert Monitor is called from an application, the system displays alerts for the alert types that exist for the objects being processed in the application for the relevant application-specific alert profile. As shown in [Figure 9.69](#), where the Alert Monitor is called from the

Product View for Product TS422_FG100 in Location 1710, alerts are visible only for the specific location product. To view alerts, an alert profile must be assigned first as shown in [Figure 9.70](#).

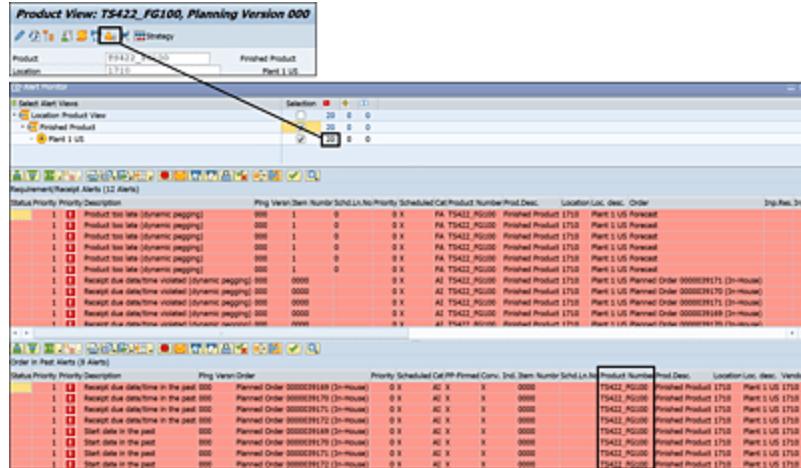


Figure 9.69 Assign an Alert Profile to the Product View Application

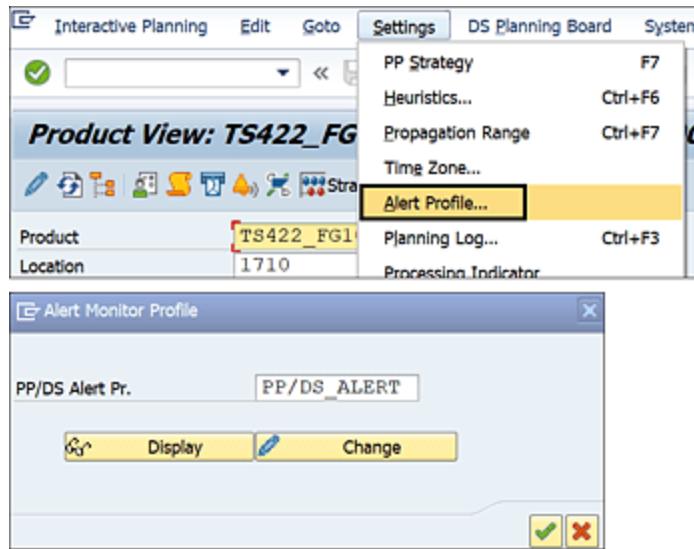


Figure 9.70 Application-Specific Alert for PP-DS

To access Alert Profile maintenance, go to **SAP Menu • Logistics • Advanced Planning • Monitoring • Alert Monitor • Alert Monitor**,

or use Transaction /SAPAPO/AMON1, and create an Application Profile for the Alert Monitor application for PP-DS ([Figure 9.71](#)).

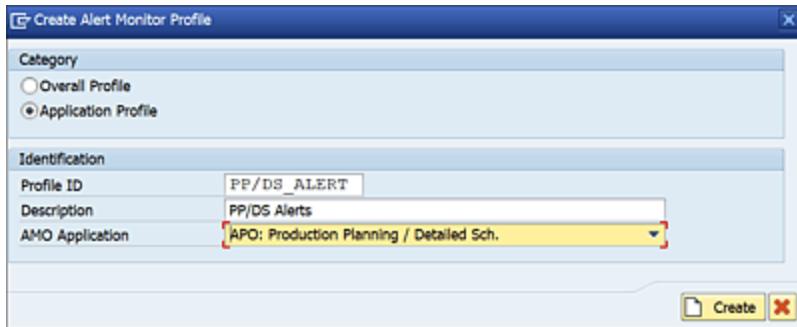


Figure 9.71 Create an Alert Monitor Application Profile

Select the alert types from the provided alerts, and define a threshold value for information, warning, and error alert types, as shown in [Figure 9.72](#). Restrict the determination of the alert to location product combinations, ATP categories, and resource

location combinations to receive only specific alerts that need attention, as shown in [Figure 9.73](#).

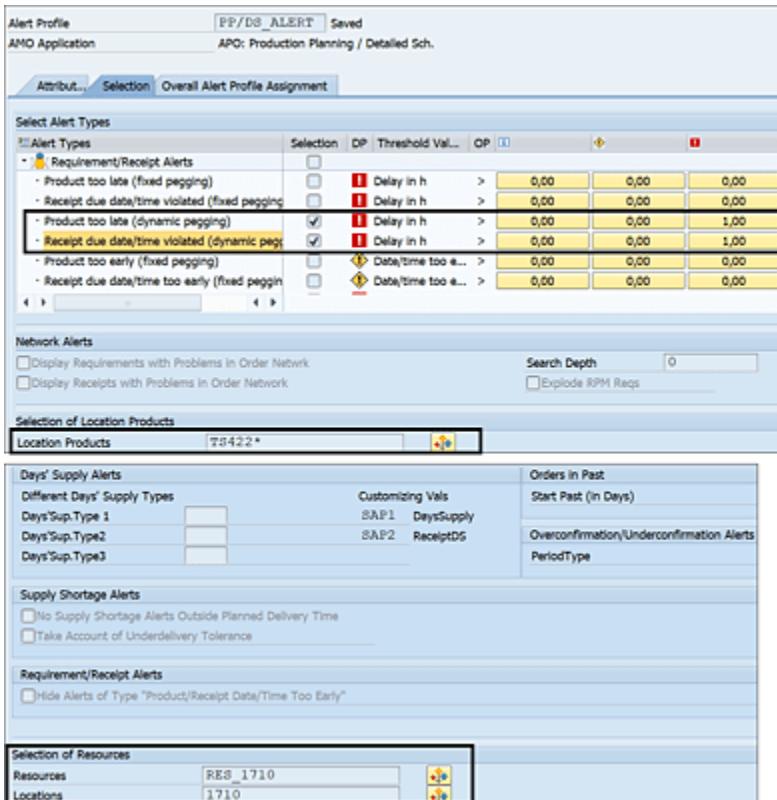


Figure 9.72 Alert Profile Maintenance (PP-DS Alert)

The image contains two screenshots of the SAP Selection Object dialog box, both titled 'Selection Object TS422*'. They show the 'Selection Parameters' table with filters applied.

Top Screenshot (Product Filter):

| Selection Dimensions | From | To | Value From | Value To |
|----------------------|-------------------------------------|--------------------------|------------|----------|
| Products | <input checked="" type="checkbox"/> | <input type="checkbox"/> | TS422* | |
| Matl Group | <input type="checkbox"/> | <input type="checkbox"/> | | |
| Proc. type | <input type="checkbox"/> | <input type="checkbox"/> | | |
| Purchasing Group | <input type="checkbox"/> | <input type="checkbox"/> | | |

Bottom Screenshot (Location Filter):

| Selection Dimensions | From | To | Value From | Value To |
|----------------------|-------------------------------------|-------------------------------------|------------|----------|
| Products | <input type="checkbox"/> | <input checked="" type="checkbox"/> | TS422* | |
| Matl Group | <input type="checkbox"/> | <input type="checkbox"/> | | |
| Proc. type | <input type="checkbox"/> | <input type="checkbox"/> | | |
| Purchasing Group | <input type="checkbox"/> | <input type="checkbox"/> | | |
| Locations | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 1710 | |
| Location Name | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 1710 | |
| Location Type | <input type="checkbox"/> | <input type="checkbox"/> | | |

Figure 9.73 Define Selection for Alert Definition (Location Product)

[»] Note

When the Alert Monitor is called from an application, for example, **Product View**, the product location selection from the **Product View** is considered and not the one defined here.

Create an overall alert profile, and assign the previously created PP-DS alert profile to the overall alert profile. An overall alert profile defines for which planning version and horizon of the Alert Monitor the alerts are identified and displayed. In addition to an overall alert profile, you can have other application alerts assigned, such as a warehouse management alert, as shown in [Figure 9.74](#).

The screenshot shows the SAP Fiori interface for maintaining an overall alert profile. The title bar says "Overall Alert Profile" and "PP/DS_OVERALL Changed". Below the title, there are tabs for "Attribut..." and "Setting", with "Setting" selected. The "Planning Version" field is set to "000 Active Version". Under the "Period" section, the "Relative Time Interval" tab is selected, showing options for Months, Weeks (selected), Days, and Hours, along with offset fields for minutes (m), weeks (w), days (d), and hours (h). The "Absolute Time Interval" tab is also present with "Start" and "End Date" fields. At the bottom, the "Application-Specific Alert Profiles" section lists "APO: Production Planning / Detailed Sch." with "Alert Profile" "PP/DS_ALERT" and "Description" "PP/DS Alerts", and "Warehouse Management" which is currently not assigned.

Figure 9.74 Overall Alert Profile Maintenance

After the alerts profiles are created, they can be added to user settings as favorites via favorites management in Transaction /SAPAPO/AMON1. This makes sure that when the Alert Monitor is called, the favorite alerts profile is selected automatically, and alerts are generated.

9.8 Predictive Material and Resource Planning

Predictive material and resource planning (pMRP) provides a simulation capability to identify capacity issues and solve them early in the planning process. Based on the forecast or PIRs, a simulation run checks the available capacity and provides the result. This result is then analyzed, and a necessary action is taken such as the following:

- Change the source of supply.
- Adjust the work center capacity.
- Adjust the forecasted demand to check the impact on the plan.

When the planner is satisfied with the plan, it can be released to the operational plan.

pMRP is executed in SAP S/4HANA using SAP Fiori apps. There are no specific transactions available in SAP S/4HANA. pMRP uses the existing master data such as material, BOM, work center, routing, and PDS. In addition, it uses PIRs as demand elements to calculate the capacity requirements. It requires no specific customizing in SAP S/4HANA to enable pMRP.

In the following steps, we'll show how a pMRP simulation is run in SAP S/4HANA using SAP Fiori apps. Before that, you must begin by maintaining PIRs either in SAP S/4HANA or by using an SAP Fiori

app for maintaining PIRs. [Figure 9.75](#) shows the PIRs maintained in SAP S/4HANA using Transaction MD61.

The screenshot shows a SAP Fiori application interface titled "Find Ind. Reqmts Display: Planning Table". At the top, there are navigation icons for Compare, History, and other functions. Below that, the planning period is set from "01.08.2021" to "17.09.2021". There are three tabs at the top: "Table", "Items", and "Schedule Lines". The "Table" tab is selected. The main area displays a grid with columns for Material, MRP A..., V, A, BU, Regmnt Segment, and weeks W 36.2021 through W 41.2021. One row is visible, showing material TS422_FG101 with values 1710, 00, checked PC, and a segment of 5,000. The weeks show values of 5,500, 7,000, 8,500, 5,250, and 3,500 respectively.

| Material | MRP A... | V | A | BU | Regmnt Segment | W 36.2021 | W 37.2021 | W 38.2021 | W 39.2021 | W 40.2021 | W 41.2021 |
|-------------|----------|----|-------------------------------------|----|----------------|-----------|-----------|-----------|-----------|-----------|-----------|
| TS422_FG101 | 1710 | 00 | <input checked="" type="checkbox"/> | PC | | 5,000 | 5,500 | 7,000 | 8,500 | 5,250 | 3,500 |

Figure 9.75 Maintaining PIRs

Further steps are executed using SAP Fiori apps as well. There are basically two SAP Fiori apps available in SAP S/4HANA that are used to execute pMRP: Schedule pMRP Simulation Creation and Process pMRP Simulation:

- **Schedule pMRP Simulation Creation app**

Schedule an application job to create a simulation. In this app, the planner defines which reference data to be considered as reference data for a simulation. There are three different job options (templates) available. The key difference between these templates is the focused object selection for running the job:

- Creation of pMRP Data via Top-Level Materials: Objects are selected based on the material master. In this, you can further

filter the object selection based on MRP parameters as shown in [Figure 9.76](#) and [Figure 9.77](#).

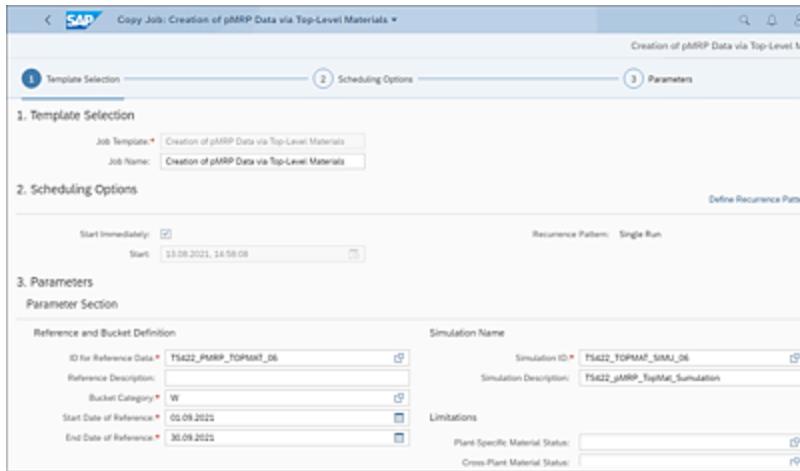


Figure 9.76 Step 1 and 2 of the Job Template

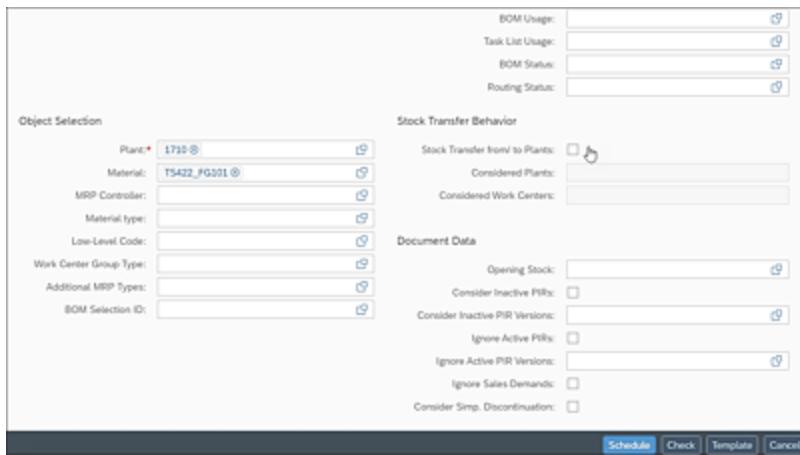


Figure 9.77 Step 3 of the Job Template for Object Selection Based on Material

- Creation of pMRP Data via Work Centers: Objects are selected based on the work center. In this, you can further filter the object selection based on work center parameters, as shown in [Figure 9.78](#).
- Creation of pMRP Data via Components: Objects are selected based on the material master. In this, you can further filter the

object selection based on the MRP parameters, as shown in [Figure 9.78](#).

The figure consists of two screenshots of SAP Fiori job templates, labeled 1 and 2.

Screenshot 1 (Top): Object Selection Based on Work Centers

| Object Selection | | Stock Transfer Behavior | |
|-------------------------|----------------------|--------------------------------|--------------------------|
| Plant: | L710 | Stock Transfer from/to Plants: | <input type="checkbox"/> |
| Work center: | Assembly | Considered Plants: | <input type="text"/> |
| Work Center Category: | <input type="text"/> | Considered Work Centers: | <input type="text"/> |
| Person Responsible: | <input type="text"/> | Document Data | |
| Work Center Group Type: | <input type="text"/> | Opening Stock: | <input type="text"/> |
| Additional MRP Types: | <input type="text"/> | Consider Inactive PIR: | <input type="checkbox"/> |
| BOM Selection ID: | <input type="text"/> | Consider Inactive PIR Version: | <input type="text"/> |
| ① | | | |

Screenshot 2 (Bottom): Object Selection Based on Components

| Object Selection | | Stock Transfer Behavior | |
|-------------------------|----------------------|--------------------------------|--------------------------|
| Plant: | L710 | Stock Transfer from/to Plants: | <input type="checkbox"/> |
| Material: | T5402_SF0100 | Considered Plants: | <input type="text"/> |
| MRP Controller: | <input type="text"/> | Considered Work Centers: | <input type="text"/> |
| Material type: | <input type="text"/> | Document Data | |
| Low Level Code: | <input type="text"/> | Opening Stock: | <input type="text"/> |
| Work Center Group Type: | <input type="text"/> | Consider Inactive PIR: | <input type="checkbox"/> |
| Additional MRP Types: | <input type="text"/> | Consider Inactive PIR Version: | <input type="text"/> |
| BOM Selection ID: | <input type="text"/> | Ignore Active PIR: | <input type="checkbox"/> |
| ② | | | |

Figure 9.78 Job Template for Object Selection Based on Work Centers and Components

[»] Note

For further pMRP process explanation, the “Creation of pMRP Data via Top-Level Material” job template is used. Other job templates can be used as well.

After the job is successfully executed, you can check the messages generated for more details.

- **Process pMRP Simulation app**

With this app, the planner can create multiple simulations, check the impact of simulated changes on capacity or demands, and make necessary decisions for production planning.

As show in [Figure 9.79](#) the pMRP simulation run has **12 Capacity Issues**. By selecting the **Simulation Summary**, the planner can have an overview of the issues and their root cause, as well as the affected calendar period. By selecting the individual simulation run

line, the planner can look into detailed issues based on the selected bucket period for planning. As shown in [Figure 9.79](#), bucket selection of **Week 37** shows a capacity overload on the **ASSEMBLY** resource of about **171%**.

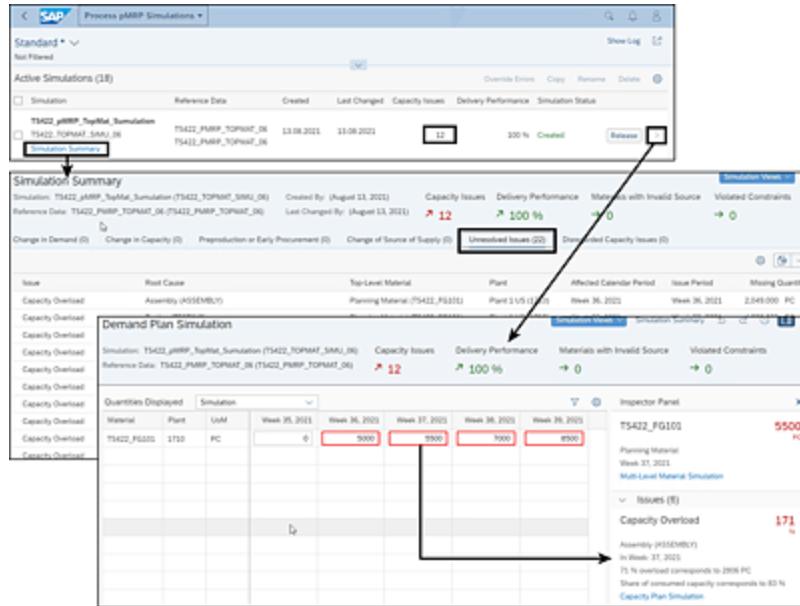


Figure 9.79 Process pMRP Simulations with “Simulation Summary and Details”

Based on the details, the planner can take the following decisions:

- Change the source of supply.
- Adjust the capacity utilization.
- Reduce (independent) demand.
- Accept the proposal from the system to either preproduce or move the production date in the future.
- Buy instead of produce if no possible resolution exists.

In [Figure 9.80](#), the planner decides to reduce the (independent) demand in **Week 36** and **Week 37**. By reducing the demand or adjusting the capacity, the capacity issues disappear in the process

pMRP simulation app, and you can see the **Capacity Issues** are reduced to **8** and **Delivery Performance** to **78%**.

If the planner decides to implement the simulation results in operative MRP, click on **Release** the simulation, as shown in [Figure 9.81](#), and select the **Version Active** to release the simulation version to the operative one. In our example, we've released the simulation to the inactive version to not overwrite the existing PIR for better visibility.

Once released to inactive, you can see there is an additional PIR added in **Version 01** with the updated quantity in the Process pMRP Simulation app.



Figure 9.80 Adjust (Independent) Demand in Week 36 and Week 37

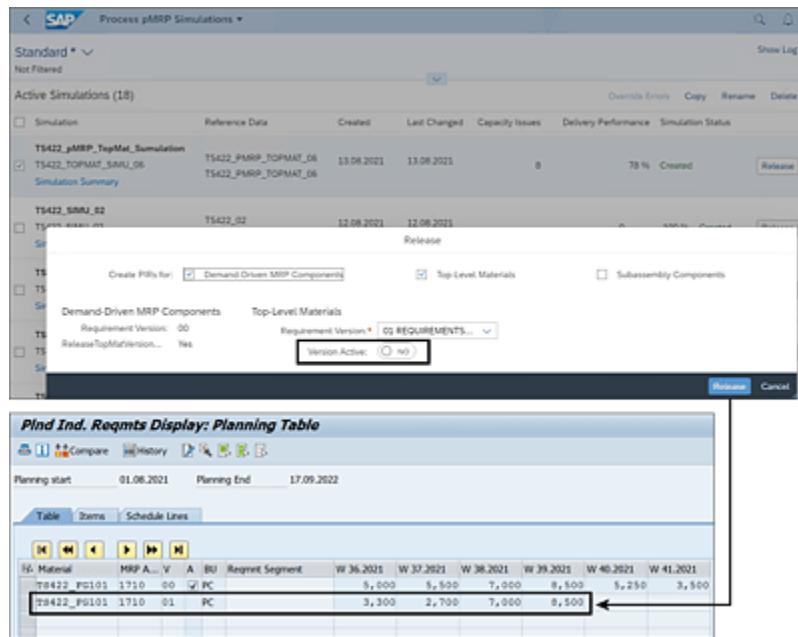


Figure 9.81 Release the pMRP Simulation to the MRP Operative or Inactive Version

9.9 Demand-Driven Replenishment

DDMRP is a methodology that focuses on the variability in the supply chain rather than forecasting. This methodology is developed by the Demand Driven Institute, and many software companies have adopted this methodology and benefited from it. SAP has also provided this methodology in SAP S/4HANA as well as in SAP IBP. To be compliant with the DDMRP methodology, the software must be able to run five important DDMRP steps, as explained later in [Figure 9.82](#).

[»] Note

The idea of this section isn't to give detailed information on DDR, but rather to give you an overview and introduction of the concept of DDR.

DDR is based on the pull-based methodology of replenishing the stocks at the different stocking nodes identified in the supply chain using DDMRP methods. DDR uses MRP to generate replenishment and the corresponding production elements.

DDR helps to define the following: 1) where to put stock in the supply chain, 2) how much to stock, and 3) correspondingly how much to produce and procure using MRP based on qualified demand. The goal is to ensure high customer service levels at the lowest possible inventory.

There are five sequential components of DDMRP methodology as shown in [Figure 9.82](#), which forms the basis of a demand-driven operating model. The first three steps define the configuration of the

DDR model, while the final two steps define day-to-day operations planning and execution.

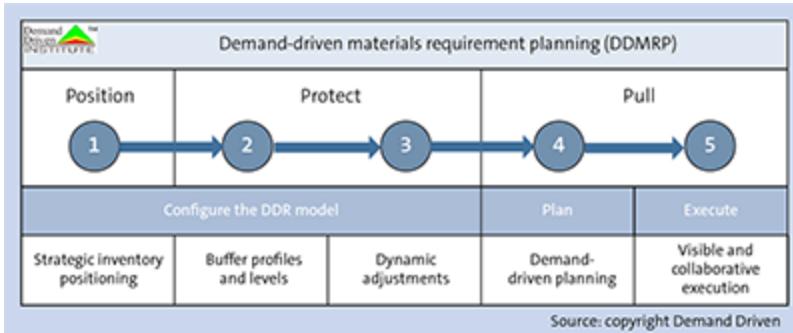


Figure 9.82 Five Components of DDMRP

[»] Note

If SAP IBP is used, the first four steps are done in SAP IBP's DDR planning model, and the final step is done in SAP S/4HANA component.

The four steps are described as follows:

1. Strategic inventory positioning (decoupling point)

In the first step, you find out where the inventory will be positioned. These are the strategic positions in the supply chain to dampen the effect of demand and supply variations. Based on the decoupling points, decoupled lead times (DLTs) are calculated.

DLT is the longest lead time from one decoupling point to the next, for example, in [Figure 9.83](#).

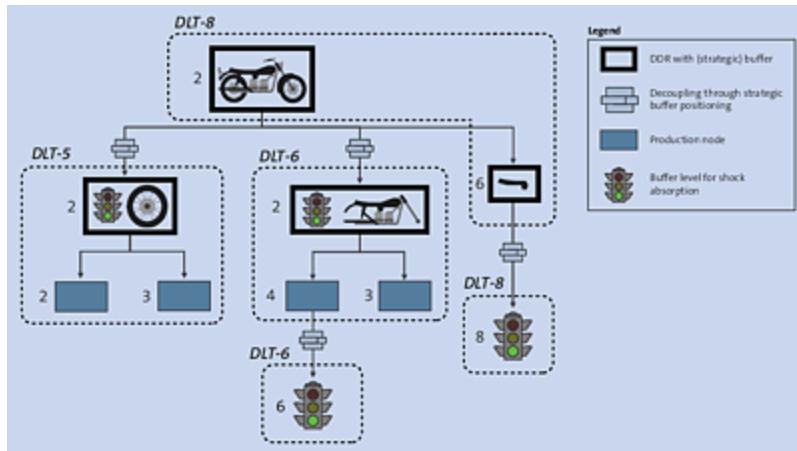


Figure 9.83 Decoupled Lead Times (DLT) Based on Decoupling Points

Based on the lead time defined, you identify where and how much buffer you should have to deal with variations in the supply chain and have as minimum possible impact on service levels.

Business benefits include the following:

- Dampen the effect of demand and supply variation on the supply chain by decoupling.
- Define the most suitable buffer positions to reduce DLT and on-hand inventory.
- Decouple material flows at strategic locations to avoid the bullwhip effect.

2. Buffer profiles and levels

Buffer profiles and levels determine the amount of protection at those decoupling points. Buffers consist of three layers: green, yellow, and red. Each color displays a corresponding severity level, as shown in [Figure 9.84](#).

The red zone denotes the highest severity in the buffer, indicating low stock levels and an immediate need for replenishment. The buffer value at the top of the red zone gives the safety stock, which is the minimum recommended buffer level that should be maintained.

The yellow zone denotes medium severity in the buffer, indicating lower than ideal stock levels and a need for replenishment. The cumulative sum of the quantities of the red and yellow zones is the reorder point.

The green zone denotes the lowest severity in the stock buffer, where if the available stock lies within this zone, there should be sufficient stock available to comfortably meet the current demand. The cumulative sum of the quantities of the red, yellow, and green zones gives the maximum stock, which is the maximum recommended buffer level beyond which the stored inventory quantity can be considered as excessive.

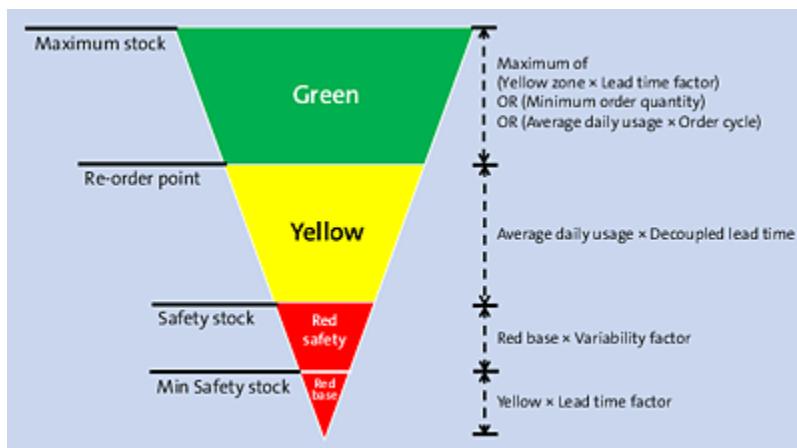


Figure 9.84 Buffer Profiles in DDR

3. Dynamic adjustments

Buffer zones are dynamically calculated using parameters such as average daily usage (ADU) and DLT, and they help to determine the maximum stock, reorder point, and safety stock.

for the stock buffer.

Dynamic adjustments define the ability to adjust buffer levels based on operating parameters, market changes, and/or planned or known future events.

4. Demand-driven planning

In this step, based on the buffer profiles and levels defined, supply orders (manufacturing orders, purchase orders, and stock transfers) are generated. Here you can benefit from MRP with the use of **Net Flow Position**.

Net flow position = On-hand inventory + Open supply – Qualified executable order demand

On-hand inventory is equal to the qualified available stocks, open supply is equal to the available order proposals (production orders, planned orders, stock transfer orders, purchase requisitions, purchase orders), and qualified executable demand is equal to the firm/executable demand that is backordered, due today, or identified as a qualified “spike” in the future.

If the net flow position falls under the green zone, no action is taken; if the net flow position falls under the yellow zone, a supply order is generated; and if the net flow position falls under the red zone, a supply order needs to be expedited (execution). In the example shown in [Figure 9.85](#), the net flow position falls

under the yellow zone, so a supply order of 4,400 is generated to reach the top level of 10,000.

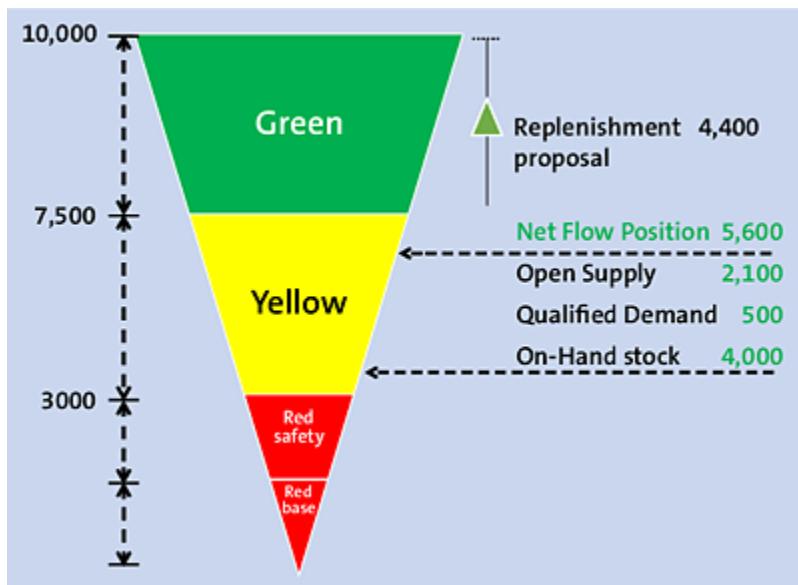


Figure 9.85 Net Flow Position

Business benefits include the following:

- Drive replenishment at strategic decoupling points based on actual demand, not forecasts
- Achieve visibility and demand-driven prioritization of supply based on buffer status at decoupling points
- Visible and collaborative execution

In SAP S/4HANA, DDR is executed using SAP Fiori apps, as shown in [Figure 9.86](#).

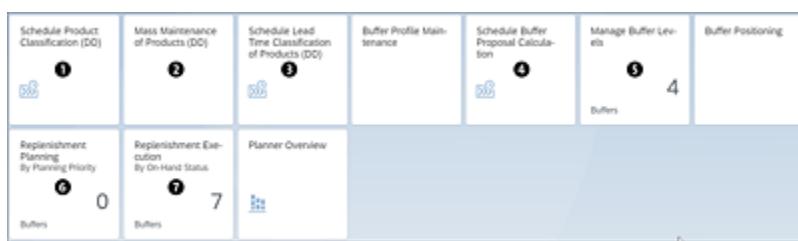


Figure 9.86 SAP Fiori Apps for DDR in SAP S/4HANA

To configure DDR, you'll use each app as follows:

① Schedule Product Classification (DD)

In this app, you identify which materials are relevant for DDR based on ABC, PQR, and XYZ classification. With the help of classification, you can identify whether the materials must be relevant for DDR and define their buffer settings. [Figure 9.87](#) shows how classification is set up using this app.

Enter material, plant, and parameters for ABC, PQR, and XYZ classification as shown in [Figure 9.87](#).

The screenshot shows the 'Parameters' window for the Schedule Product Classification (DD) app. It is divided into four main sections: 'Thresholds for Value (ABC) Classification', 'Thresholds for BOM Usage (PQR) Classification', 'Thresholds for Variability (XYZ) Classification', and 'Job Parameters'.

1. **Thresholds for Value (ABC) Classification:** Contains fields for 'Usage Value In %' with checkboxes for A (High), B (Medium), and C (Low). The values are 70, 20, and 10 respectively.
2. **Thresholds for BOM Usage (PQR) Classification:** Contains fields for 'BOM Usage' with checkboxes for P (High), Q (Medium), and R (Low). The values are 4, 2, and < respectively.
3. **Thresholds for Variability (XYZ) Classification:** Contains fields for 'Coefficient of Variation' with checkboxes for X (Low), Y (Medium), and Z (High). The values are 0.50, 0.80, and > respectively.
4. **Job Parameters:** Contains checkboxes for 'Maintain Logs' (checked) and 'Parallel Processing' (unchecked).

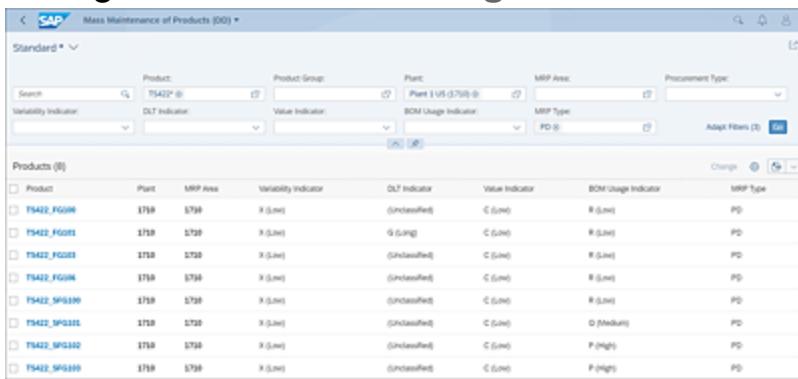
At the bottom right, there are four buttons: 'Schedule' (highlighted in blue), 'Check', 'Template', and 'Cancel'.

Figure 9.87 Schedule Product Classification (DD) App

② Mass Maintenance of Products (DD)

Using this app, you update or change the **MRP Type** to “D1” (DDR, fixing type 1) with lot-size replenishment procedure set to “H1”, that is, replenish to maximum stock level.

Based on the previous step, you can select the products that are relevant for DDR per classification ABC, PQR, and XYZ, and change the respective master record in mass. As shown in [Figure 9.88](#), select the materials for which you want to make the change, and click on **Change**.



The screenshot shows the SAP Mass Maintenance of Products (DD) application. At the top, there are search fields for Product (TS4422_FG008), Product Group, Part (Part 1 US (3708)), MRP Area, and Document Type. Below these are dropdowns for Variability Indicator, DLT Indicator, Value Indicator, BOM Usage Indicator, and MRP Type (set to PD). A button for 'Adapt Filters (3)' is also present. The main area is titled 'Products (8)' and contains a table with columns: Product, Part, MRP Area, Variability indicator, DLT indicator, Value indicator, BOM Usage indicator, and MRP type. The table lists several products, all currently assigned to MRP Type PD. The last column, 'MRP type', has a 'Change' button next to it.

| Product | Part | MRP Area | Variability indicator | DLT indicator | Value indicator | BOM Usage indicator | MRP type |
|---------------|------|----------|-----------------------|----------------|-----------------|---------------------|----------|
| TS4422_FG008 | 3708 | 5708 | X (Low) | (Unclassified) | C (Low) | R (Low) | PD |
| TS4422_FG001 | 3708 | 5708 | X (Low) | G (High) | C (Low) | R (Low) | PD |
| TS4422_FG003 | 3708 | 5708 | X (Low) | (Unclassified) | C (Low) | R (Low) | PD |
| TS4422_FG004 | 3708 | 5708 | X (Low) | (Unclassified) | C (Low) | R (Low) | PD |
| TS4422_MG0309 | 3708 | 5708 | X (Low) | (Unclassified) | C (Low) | R (Low) | PD |
| TS4422_MG0310 | 3708 | 5708 | X (Low) | (Unclassified) | C (Low) | G (Medium) | PD |
| TS4422_MG0340 | 3708 | 5708 | X (Low) | (Unclassified) | C (Low) | F (High) | PD |
| TS4422_MG0309 | 3708 | 5708 | X (Low) | (Unclassified) | C (Low) | F (High) | PD |

Figure 9.88 Mass Maintenance of Products (DD) App

By selecting one of the materials and selecting **Change**, a popup appears in which you can make a change to **MRP Type** “D1” (DDR, fixing type 1) with **Lot Sizing Procedure** set to “H1”, that is, replenish to maximum stock level. Along with

these, other parameters can also be changed, as shown in Figure 9.89.

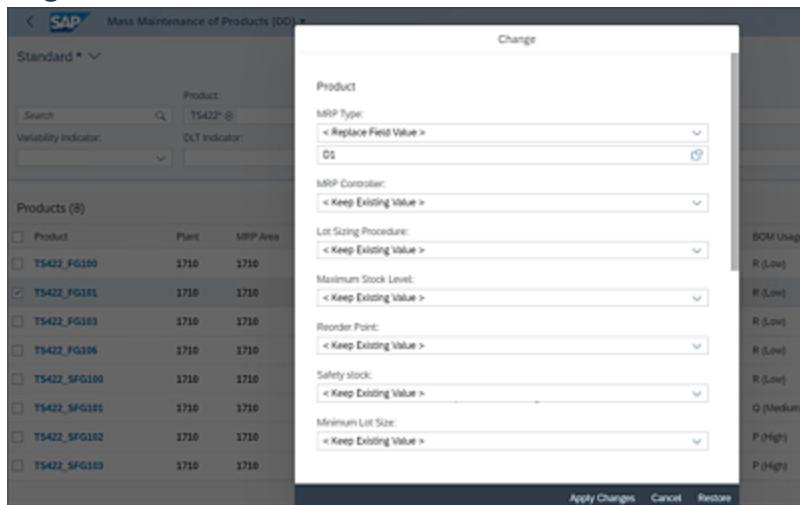


Figure 9.89 Maintain/Update the MRP Type, Lot Size and More in the App

After the master data change, it can be seen in the material master **MRP 1** view shown in Figure 9.90.

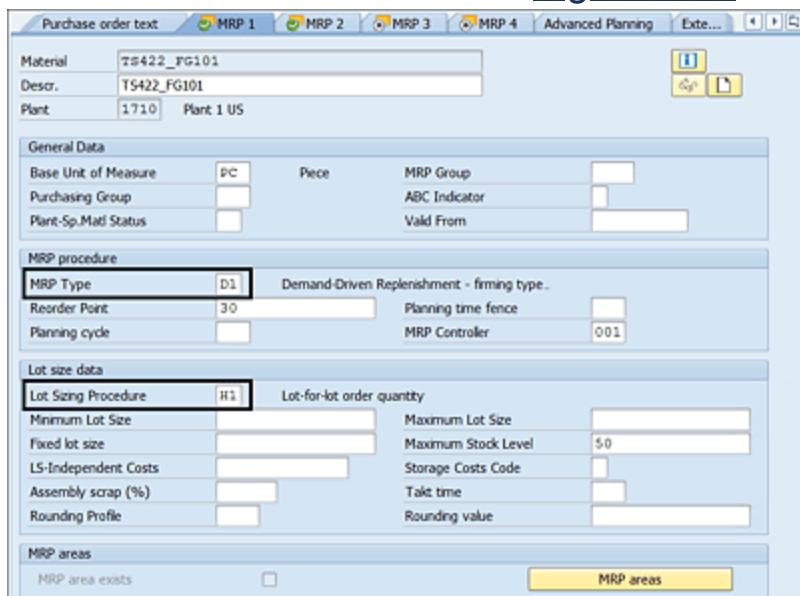


Figure 9.90 MRP 1 View with MRP Type and Lot Size Change to DDR Relevant

③ Schedule Lead Time Classification of Products (DD)

In this app, you calculate the DLT based on the decoupling points identified, which helps to calculate later buffer levels.

In the app shown in [Figure 9.91](#), enter the **DLT Threshold for Make**, **DLT Threshold for Buy**, and **DLT Threshold for Transfers (in Days)**. Also enter the **Number of Days (Past)**. A lead time indicator is set as the outcome of the job run.

The screenshot shows the SAP Fiori interface for the 'Decoupled Lead Time (EFG) Classification of Products (DD)' application. The top navigation bar includes the SAP logo and the title 'New Job: Decoupled Lead Time (EFG) Classification of Products (DD)'. Below the title, there are three tabs: 'Template Selection' (selected), 'Scheduling Options', and 'Parameters'. The 'Parameters' tab is currently active, showing the following input fields:

- Number of Days (Past):** 10
- DLT Thresholds for Make (in Days):**
 - E (Short): 001
 - F (Medium): 003
 - G (Long): >
- DLT Thresholds for Buy (in Days):**
 - E (Short): 001
 - F (Medium): 003
 - G (Long): >
- DLT Thresholds for Transfer (in Days):**
 - E (Short): 001
 - F (Medium): 003
 - G (Long): >
- Job Parameters:**
 - Parallel Processing:
 - Maintain Logs:

Figure 9.91 Schedule Lead Time Classification for Products (DD) App

④ Schedule Buffer Proposal Calculation (DD)

In this app, you generate buffer (stock) level proposals for DDR-relevant materials based on their ADU, DLT, buffer profiles, and so on. Additionally, you can schedule job runs to recalculate the buffer proposals periodically to keep them up to date.

Execute the buffer proposal calculation as shown in [Figure 9.92](#).

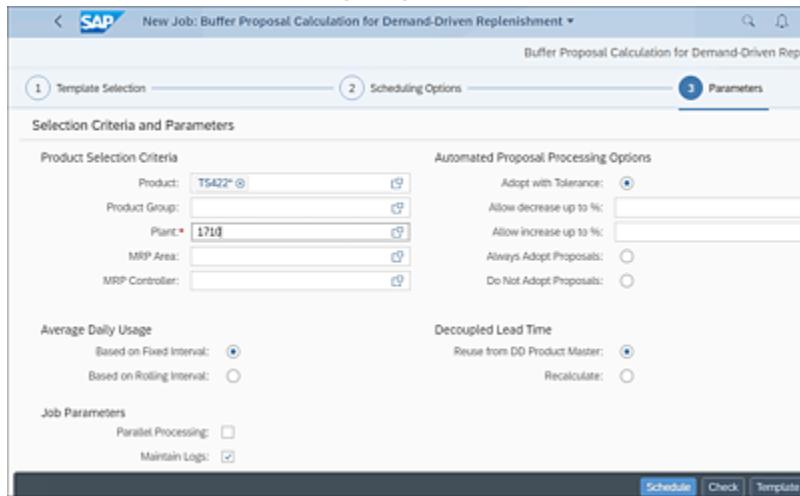


Figure 9.92 Schedule Buffer Proposal Calculation App

5 Manage Buffer Levels

In this app, you review the buffer levels shown in [Figure 9.93](#) based on the current operational situation.

Buffer (stock) level proposals help to manage the safety stock, reorder point, and maximum stock for the material through the Manage Buffer Levels app. Several factors are taken into consideration when calculating buffer proposals for DDR-relevant materials. You can review the details behind the **Buffer Levels** proposed and, if required, make adjustments to the proposed buffer levels.

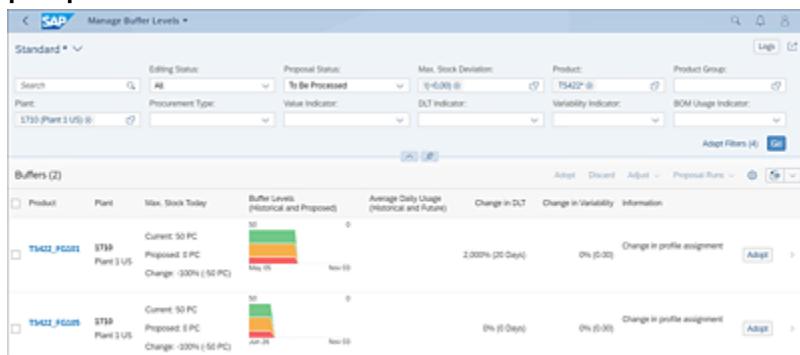


Figure 9.93 Manage Buffer Levels App

⑥ Replenishment Planning By Planning Priority

The materials with MRP type D1 are considered in the MRP Live run, and the net requirement logic used is DDR based on the MRP type. The outcome of this run gives you the net flow position (refer to [Figure 9.85](#) for more insight into net flow position calculation). As shown in [Figure 9.94](#), the planning results outcome includes the following:

- **Planning Priority:** Priority based on the net flow position/max stock.
- **Net Flow Position:** Net flow position calculated.
- **Proposed Quantity:** Amount of quantity needed to bring inventory back to target. This is also the amount of planned order quantity that is expected to be generated during the next MRP run if the net flow position is below the reorder point, that is, status is yellow or worse.
- **On-Hand Buffer Status:** On-hand stock percentage of safety.
- **On-Hand Stock:** On-hand stock quantity.
- **Open Supply:** Number of make/buy/transfer orders in the system for this material.
- **Execution Action:** Quick action to create supply or expedite

supply.

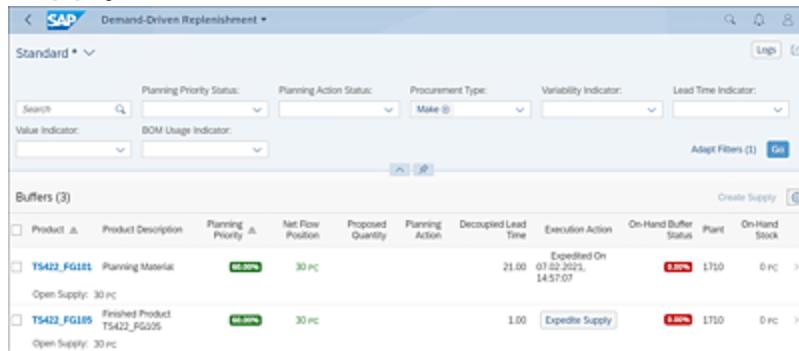


Figure 9.94 Replenishment Proposal Based Net Flow Calculation in the MRP Run

7 Replenishment Execution

Using this app, you expedite orders through prioritization by evaluating the severity based on the on-hand stock. The app shows **On-Hand Buffer Status**, **On-Hand Stock**, **Open Supply**, and proposed **Execution Actions** (see [Figure 9.95](#)).

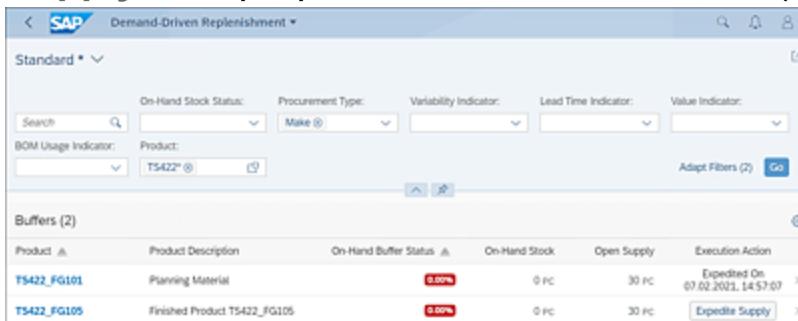


Figure 9.95 Replenishment Execution by On-Hand Status App

8 Planner Overview

In addition to DDR planning and execution apps, this app helps to view and act based on the most important information and tasks in the actual planning situation. As shown in [Figure 9.96](#), the planner can see the buffer level, replenishment planning situation, and replenishment execution by selecting the relevant key figures and reacting promptly.

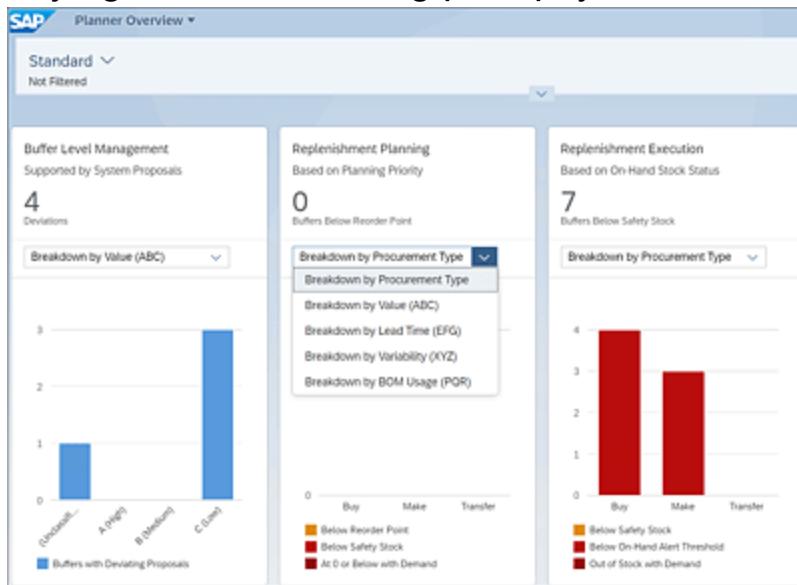


Figure 9.96 Planner Overview App

9.10 Important Terminology

In this chapter, the following terminology was used:

- **Available-to-promise (ATP)**

This represents the availability check of a material.

- **Average daily usage (ADU)**

This represents the average daily usage of a part, component, or product.

- **Bill of materials (BOM)**

A BOM represents the relationships among items (e.g., finished product and its assemblies, assemblies and their components).

- **Characteristic-dependent planning**

This is planning based on characteristic in which characteristics are used together with master data to classify and specify objects such as materials, stock, or resources.

- **Core Interface (CIF)**

This interface is used for data transfer between an SAP ERP system or SAP ERP component of SAP S/4HANA and a connected SAP SCM system (e.g., SAP Advanced Planning and Optimization or embedded PP-DS in SAP S/4HANA).

- **Decoupled lead time (DLT)**

This is the qualified cumulative lead time defined as the longest unprotected/unbuffered sequence in a BOM.

- **Demand-driven material requirements planning (DDMRP)**

This methodology was developed by the Demand Driven Institute, which focuses on the variability in the supply chain rather than forecasting.

- **Demand-driven replenishment (DDR)**
This add-on licensed module is based on the Demand Driven Institute DDMRP methodology in SAP IBP. It's also available as a module in SAP S/4HANA.
- **Demand planning**
This application component in SAP Advanced Planning and Optimization allows you to forecast market demand for your company's products and produce a demand plan. The component is now available in SAP IBP.
- **Detailed scheduling (DS)**
This functionality in PP-DS allows you to schedule orders on a second-by-second level.
- **Embedded production planning and detailed scheduling (embedded PP-DS)**
The PP-DS component of SAP Advanced Planning and Optimization is now embedded in SAP S/4HANA.
- **Material requirements planning (MRP)**
MRP determines when (date), what (which material), and how much (quantity) of a material is required in supply chain planning.
- **Model mix planning**
This is the planning and sequence optimization for the configurable products, which are produced together on a production line.
- **Predictive material and resource planning (pMRP)**
pMRP deals with predicting the impact on the resource capacity based on the forecast, with suggestions to overcome the bottleneck issues. pMRP focuses in long-term planning (LTP).
- **Production planning and detailed scheduling (PP-DS)**
This module in SAP Advanced Planning and Optimization enables

the planning of production within a plant and at the same time taking capacity constraints into account. The aim of this module is to increase throughput and reduce lead time to produce.

- **Purchasing info record**

Purchasing info records represent a procurement relation between materials and the supplier. A purchasing info record can be standard, subcontracting, pipeline, or consignment.

- **SAP Advanced Planning and Optimization**

This module of SAP Supply Chain Management (SAP SCM) is an advanced planning tool providing short- to long-term planning possibilities with advanced heuristic algorithms.

- **SAP Integrated Business Planning for Supply Chain (SAP IBP)**

This SAP cloud-based solution for sales and operations planning (S&OP), demand, response and supply, DDR, and inventory planning is considered a replacement of SAP Advanced Planning and Optimization.

9.11 Practice Questions

These questions will help you evaluate your understanding of the topics covered in this chapter. They are similar in nature to those on the certification examination. Although none of these questions will be found in the exam itself, they will allow you to review your knowledge of the subject. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers and only correct answers to receive credit for the question.

1. Which of the following components belong to SAP S/4HANA?
 - A.** PP-DS
 - B.** Demand planning
 - C.** Response and supply planning
 - D.** Inventory management
2. Which indicator in the material master determines if a material is relevant for advanced planning?
 - A.** Availability check of the finished product
 - B.** MRP type of material
 - C.** Individual/collective requirement
 - D.** Advanced Planning indicator
3. An operation isn't transferred to the PP-DS component in PDS. What are the possible reasons? (There are two correct answers.)
 - A.** The control key for the operation isn't relevant for detailed capacity requirement and scheduling.
 - B.** The setup time isn't maintained in the operation.

- C.** The work center assigned in the operation isn't relevant for advanced planning.
 - D.** A BOM component assigned to the operation isn't available in PP-DS.
4. In which views can you select the **Advanced Planning** checkbox? (There are two correct answers.)
- A.** Advanced Planning view of the material master
 - B.** Basic Data view of work centers
 - C.** Capacity view of work centers
 - D.** MRP 1 view of material master
5. Which master data can't be transferred to PP-DS if the CIF models aren't generated and activated?
- A.** Materials
 - B.** Work centers
 - C.** Purchasing info records
 - D.** Production data structures
6. Is it possible to create a mixed resource in PP-DS for a work center with **Advanced Planning** active?
- A.** Yes, resource creation in PP-DS only depends on the **Advanced Planning** checkbox.
 - B.** No, a mixed resource requires the bucket capacity to be maintained, which isn't possible in PP-DS.
7. To execute the subcontracting process in PP-DS, what must be set up in SAP S/4HANA? (There are two correct answers.)
- A.** Subcontracting MRP areas
 - B.** Storage locations as MRP areas
 - C.** Production versions
 - D.** Routings

8. What steps are possible in a PP-DS production planning run?

- A.** Change fixing/planning intervals
- B.** Execute planning and scheduling heuristics
- C.** Execute optimization as a planning step
- D.** All of the above

9. Can the planned order for a material, which is advanced-planning-relevant, be created using MRP Live?

- A.** No, because the material is planned in PP-DS; therefore, only a planning heuristic in PP-DS can create it.
- B.** Yes, MRP Live can plan the materials, which are advanced-planning-relevant.

10. Which functional capabilities does the DS planning board have? (There are three correct answers.)

- A.** Converting planned orders to production orders
- B.** Fixing orders
- C.** Entering time-ticket confirmation for production orders
- D.** Undoing drag-and-drop planning activities

11. A planner is trying to move an order from one resource to another, but gets an error. What caused the error? The resource to which planner is moving the order to:

- A.** Is maintained as an alternate resource to the resource where the order currently exists.
- B.** Isn't maintained in the routing operation (PDS) of the material in PP-DS.
- C.** Isn't a finite scheduling resource.
- D.** Has a mode priority maintained as "B".

12. A customer wants to display the planned order and production orders in the DS board in different colors. In which DS board

profile can the required setting be done?

- A.** Production planning strategy profile
- B.** DS strategy profile
- C.** Heuristic profile
- D.** Planning board profile

13. Which settings do we find in a detailed scheduling strategy?

- A.** Lot-sizing procedure
- B.** Whether a planned order or purchase requisition is created
- C.** Planning direction, starting from the desired date
- D.** Planning in nonworking times

14. Which of the following statements is true?

- A.** A firmed order can be scheduled/rescheduled, but a date fixed order can't be scheduled/rescheduled using scheduling heuristics.
- B.** A firmed order can't be scheduled/rescheduled, but a date fixed order can be scheduled/rescheduled using scheduling heuristics.
- C.** Neither the firmed order nor the date fixed order can be scheduled/rescheduled using scheduling heuristics.
- D.** Both the firmed order and the date fixed order can be scheduled/rescheduled using scheduling heuristics.

15. How do you find out issues in the supply chain due to available capacity?

- A.** By running an infinite heuristic and looking at alerts generated due to overload
- B.** By running a finite heuristic and looking at alerts generated due to overload

16. What does MRP type “D1” mean for a material?
- A.** The material is planned in PP-DS.
 - B.** The material is planned with reorder point planning.
 - C.** The replenishment element is created based on its **Net Flow Position**.
 - D.** The material isn’t planning relevant.
17. With this app, you can generate buffer (stock) level proposals for your DDR-relevant products based on their average daily usage, decoupled lead time, buffer profiles, and several other factors.
- A.** Replenishment Planning by Planning Priority app
 - B.** Schedule Buffer Proposal Calculation app
 - C.** Schedule Product Classification app
 - D.** Replenishment Execution app
18. Which functional capabilities does PP-DS *not* have?
- A.** Supply network planning: considering capacities of different nodes (production plants, supply plants, vendors, etc.) in the supply chain
 - B.** Forecast planning
 - C.** Advance available-to-promise (aATP)
 - D.** All of the above
19. During planned order conversion to production order, an error occurred. What are the possible reasons?
- A.** The planned order is fixed in the DS board.
 - B.** The planned order is already converted to the production order.
 - C.** The **Work Scheduling** view isn’t maintained for the material.

- D.** The Advanced Planning view isn't maintained for the material.
20. Which transactional data is required for predictive material and resource planning (pMRP)?
- A.** Planned independent requirements (PIRs)
 - B.** Planned orders
 - C.** Purchase orders
 - D.** Sales orders

9.12 Practice Answers and Explanations

1. Correct answer: A

SAP has moved the PP-DS component from SAP Advanced Planning and Optimization to SAP S/4HANA, while demand and supply network planning have been moved to SAP IBP. Inventory management is introduced by SAP in SAP IBP only.

2. Correct answer: D

The **Advanced Planning** indicator in the **Advanced Planning** view of the material master activates and transfers the material to PP-DS immediately after saving if the prerequisite master data already exists in PP-DS.

3. Correct answers: A and C

An operation has a work center assigned, and if the work center doesn't exist in PP-DS, which is a prerequisite, the operation information can't be transferred. Similarly, only the operations that are relevant for detailed capacity requirements and scheduling (setting in the control key) are transferred to the)PP-DS component of SAP S/4HANA.

4. Correct answers: A and B

The **Advanced Planning** checkbox exists only in the **Advanced Planning** view of the material master and the **Basic Data** view of the work center. The **Capacity** view is used to maintain capacity-relevant information.

5. Correct answer: C

Purchasing info records are transferred to PP-DS using CIF, while material and work centers are transferred via the **Advanced Planning** checkbox. Production data structures are transferred using Transaction CURTOADV_CREATE (PDS Transfer [PP-DS]).

6. Correct answer: **B**

It's not possible to create mixed resources when **Advanced Planning** is active because the supply network planning module isn't part of SAP S/4HANA, where mixed resources are used and bucket capacities are maintained.

7. Correct answers: **A and C**

An MRP area for each subcontractor must be created in SAP S/4HANA. To plan the subcontractor separately, the MRP area must be assigned for the components in the **MRP 1** view with the field's value. In addition to transferring BOM information to PP-DS, a production version is necessary and must be assigned in the purchasing info record for the subcontracting material. Routing is relevant for in-house produced material.

8. Correct answer: **D**

In the production planning run, it's possible to execute heuristics: SAP_DS_03 to change fixing/planning intervals, planning and scheduling heuristic such as planning of standard lots, schedule sequence, and optimization using the optimization profile.

9. Correct answer: **B**

MRP Live considers the materials that are advanced planning relevant and creates planned orders or purchasing elements based on product heuristics; therefore, it's capable of a

complete planning run, including PP-DS materials and non-PP-DS materials.

10. Correct answers: **A, B, and D**

An order can be fixed in the DS board with **Fix** option, and a conversion indicator can also be set along with the drag and drop function of orders over the chart. Order confirmations can only be done in production execution.

11. Correct answer: **B**

If the work center isn't part of the routing, an order can't be scheduled on it. An order can be scheduled on an alternate resource, an alternate resource with a lower mode priority, and even a resource that is infinitely planned but is part of the PDS.

12. Correct answer: **D**

Customization regarding the objects to be displayed, the charts to be displayed, the text and location of the text in the chart to be displayed, chart column selection, column sorting criteria, and color of the bars in the chart are all done in the planning board profile.

13. Correct answers: **C and D**

In the DS strategy profile, a planning direction, for example, forwards or backwards, and the desired dates, for example, current date, earliest date, or specified date, are set. Along with this, the **Non-Working Time** indicator can be set, which enables operations scheduling in nonworking times.

14. Correct answer: **A**

In PP-DS, the scheduling heuristics schedules/reschedules the firmed order, but a date fixed order can't be rescheduled using

DS heuristics. Such orders must first be unfixed to reschedule.

15. Correct answer: **A**

By running the infinite heuristic, it's possible to get an overload situation to find the bottleneck, which can then be checked using the Alert Monitor. If the finite heuristic is used, the orders will always be planned and scheduled up to 100% capacity utilization, so the overload situation will never arise.

16. Correct answer: **C**

MRP type "D1" indicates that the material is planned with DDR based on the net flow position. If the net flow position falls in the red or yellow buffer zone, a new receipt element is generated for replenishment to the top of the green zone.

17. Correct answer: **B**

In the Schedule Buffer Proposal Calculation app, you generate buffer (stock) level proposals for DDR-relevant materials based on their ADU, DLT, buffer profiles, and so on.

18. Correct answer: **D**

PP-DS isn't capable of supply network planning, where the capacities can be checked against demand across supply chain nodes. Forecast planning is part of demand planning and aATP is another component of SAP S/4HANA like PP-DS is.

19. Correct answer: **C**

A planned order can't be converted to a production order if the Work Scheduling view isn't maintained, which is mandatory for in-house-produced material and helps to identify the production

order type and action to be taken when the planned order is converted to the production order.

20. Correct answer: **A**

Planned orders, purchase orders, and sales orders are execution elements, which aren't used in pMRP.

9.13 Test Takeaway

This chapter describes the master data required for embedded PP-DS and how that master data is integrated between S/4HANA and embedded PP-DS. You should be familiar with and have a good understanding of material master fields important for advanced planning. You should be able to explain the difference of planning possibilities between them. You should be able to explain the configuration required in order to plan, e using either PP-DS or combining MRP Live and various heuristics available in PP-DS. You should be familiar with the planning process steps, alert monitoring, and detailed scheduling possibilities available in PP-DS with evaluation capabilities and SAP Fiori apps.

9.14 Summary

PP-DS is a key module that focuses on short-term and day-to-day planning. The module is enriched with advanced planning and scheduling algorithms, which enables the planner to run various scheduling possibilities and simulations to reach the best possible solution. It's integrated with production, so the real-time planning of production issues can be closely checked and an action can be taken. PP-DS supports various processes across industries (e.g., make-to-order production or make-to-stock production) and production types (e.g., shop floor production, repetitive manufacturing, or process manufacturing).

The Author



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Siva Kumar has C_TS422_1909 certification. He also has broader industry certifications such as APICS-CPIM and ISCEA-CDDP, as well as various QMS certifications, including ISO-14001 lead auditor, ISO-900, and ISO/TS-16949 internal auditor.

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Certification Validities

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Available Certifications:

| | |
|---|------------------------------|
| C_ACTIVATE13 - SAP Certified Associate - SAP Activate Project Manager | View Details |
| C_ARCIG_2108 - SAP Certified Application Associate - SAP Ariba Integration with Cloud Integration Gateway | View Details |
| C_ARCON_2108 - SAP Certified Application Associate - SAP Ariba Contracts | View Details |
| C_ARP2P_2108 - SAP Certified Application Associate - SAP Ariba Procurement | View Details |
| C_ARSCC_2108 - SAP Certified Application Associate - SAP Ariba Supply Chain Collaboration | View Details |
| C_ARSOR_2108 - SAP Certified Application Associate - SAP Ariba Sourcing | View Details |
| C_ARSUM_2108 - SAP Certified Application Associate - SAP Ariba Supplier Management | View Details |
| C_BOBIP_42 - SAP Certified Application Associate - SAP BusinessObjects Business Intelligence Platform 4.2 | View Details |
| C_BOBIP_43 - SAP Certified Application Associate - SAP BusinessObjects Business Intelligence Platform 4.3 | View Details |

Figure 1 List of Available Certifications

Certification Validities

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Available Certifications:

Soon to expire Certifications

| | | |
|---|--------------------|------------------------------|
| C_BRIM_1909 - SAP Certified Application Associate - SAP Billing and Revenue Innovation Management | December 31st 2021 | View Details |
| C_C4H420_94 - SAP Certified Application Associate - SAP CPQ Implementation | October 30th 2021 | View Details |
| C_C4HL2C_92 - SAP Certified Business Associate - SAP C/4HANA Business Processes: Lead to Cash | December 31st 2021 | View Details |
| C_EP_750 - SAP Certified Technology Associate - SAP Enterprise Portal 7.50 | December 31st 2021 | View Details |
| C_HRHHTH_1708 - SAP Certified Application Associate - SAP SuccessFactors Talent Hybrid (1708) | December 31st 2021 | View Details |
| C_PAII10_35 - SAP Certified Application Associate – SAP Predictive Analytics | December 31st 2021 | View Details |

Figure 2 Soon-to-Expire Certifications

The screenshot shows the SAP TRAINING website interface. At the top, there is a navigation bar with links for "Explore catalog", "SAP Learning Hub", "SAP Certification", and "More". Below the navigation bar is a search bar with the placeholder text "Enter keyword to search for courses, certifications or training paths". The main content area displays a course card for "C_TS422_2020". The course title is "SAP Certified Application Associate - SAP S/4HANA Production Planning and Manufacturing". The course details include:

| Delivery Methods: | SAP Certification | Exam: | 80 questions |
|-------------------|-------------------|-------------------|---------------------------|
| Level: | Associate | Sample Questions: | View more |
| | | Cut Score: | 56% |
| | | Duration: | 180 mins |
| | | Languages: | English, Chinese |

Figure 3 C_TS422_2020 on the SAP Training Web Shop Site

Topic Areas

Please see below the list of topics that may be covered within this certification and the courses that cover them. Its accuracy does not constitute a legitimate claim; SAP reserves the right to update the exam content (topics, items, weighting) at any time.

| | | |
|--|----------|---|
| Advanced Planning in SAP S/4HANA | > 12% | > |
| Production Orders in SAP S/4HANA | > 12% | > |
| Master Data in SAP S/4HANA | > 12% | > |
| Material Requirements Planning in SAP S/4HANA | 8% - 12% | > |
| Lean Manufacturing in SAP S/4HANA | 8% - 12% | > |
| Capacity Planning in SAP S/4HANA | 8% - 12% | > |
| Demand Management in SAP S/4HANA | < 8% | > |
| Introduction to SAP S/4HANA Production Planning | < 8% | > |
| Introduction to SAP S/4HANA Supply Chain Planning | < 8% | > |
| Process Orders in SAP S/4HANA | < 8% | > |

Figure 4 Topic Areas for C_TS422_2020 and C_TS422_1909

The screenshot shows the SAP Learning Journey for the role of Consultant. At the top, there's a header with a location pin icon, the title "SAP S/4HANA - Manufacturing", a subtitle about learning how to implement and customize features, and a note that it's valid for SAP S/4HANA on-premise and SAP S/4HANA Cloud, extended and private editions. Below this is a "Last updated October 2021" message. A zoom control slider is set at 57%. On the right, there's a sidebar titled "SAP Learning Journey for the role" with a "Consultant" section. The main content area has three sections: "Join the SAP Learning Room", "Start with an overview", and "Become competent". Each section has a blue circular icon with a white location pin. Under "Join the SAP Learning Room", there's a note about finding in-depth knowledge and becoming certified. Below this are five course cards for SAP S/4HANA Manufacturing, each with a thumbnail of a laptop displaying charts, the course name, and a code. To the right of these courses is a note about alternatives for certification, mentioning Classroom Academy (T5411 + T5422) or SAP Blended Learning Academy (W54HPP). Further right is a "SAP GLOBAL CERTIFICATION APPLICATION ASOCIATE" section with the SAP logo and "Application Consultant".

Figure 5 SAP S/4HANA: Manufacturing

TS421

SAP S/4HANA Production Planning and Manufacturing I

Delivery Methods: Classroom
Duration: 10 days
Level: Consultant Academy Training
Languages: English

Solution Release: SAP S/4HANA 2020  

Course announcements

- This comprehensive course has been designed for entry-level production planning and manufacturing consultants who intend to pursue an SAP Associate Certification in SAP S/4HANA Production Planning and Manufacturing (C_TS422). This course is the first of two courses which cover the most critical production planning and manufacturing functions, and configuration requirements you'll need to know for implementing the Production Planning and Manufacturing module. Through lectures and numerous exercises, you will receive extensive practice working through many business transactions leading to increased confidence in applying what you have learned, in subsequent projects.

Course information

Content

- Course book 1 (out of 2):
 - Master Data for Production
 - Material
 - Bill of Material (BOM)

Figure 6 Academy Course TS421: First of Two Courses for TS422 Certification

Find a course date

| Country | Timeframe | Language | Delivery method | |
|---|--|---|-----------------|---|
| Please select | Showing all | Showing all | Showing all | |
| <input type="checkbox"/> Guaranteed to run (GTR) <small>(?)</small> | | | | |
| Sweden Clear all filters Download | | | | |
| Displaying 4 / 4 | | | | |
| Course | Date(s) | Location | Language | Price |
| S4220 - Production Planning in SAP S/4HANA SAP S/4HANA 2020 | 21 Feb 2022 - 25 Feb 2022 <small>▼ Show class times</small> | SAP Learning Class, virtual option - Sweden, Sweden Virtual Training | English | 37,410.00 kr (SEK) Price excludes tax Book |
| S4220 - Production Planning in SAP S/4HANA SAP S/4HANA 2020 | 16 May 2022 - 20 May 2022 <small>▼ Show class times</small> | SAP Learning Class, virtual option - Sweden, Sweden Virtual Training | English | 37,410.00 kr (SEK) Price excludes tax Book |
| S4220 - Production Planning in SAP S/4HANA SAP S/4HANA 2020 | 8 Aug 2022 - 12 Aug 2022 <small>▼ Show class times</small> | SAP Learning Class, virtual option - Sweden, Sweden Virtual Training | English | 37,410.00 kr (SEK) Price excludes tax Book |
| S4220 - Production Planning in SAP S/4HANA SAP S/4HANA 2020 | 14 Nov 2022 - 18 Nov 2022 <small>▼ Show class times</small> | SAP Learning Class, virtual option - Sweden, Sweden Virtual Training | English | 37,410.00 kr (SEK) Price excludes tax Book |

Figure 7 Individual Course Search in a Country Area

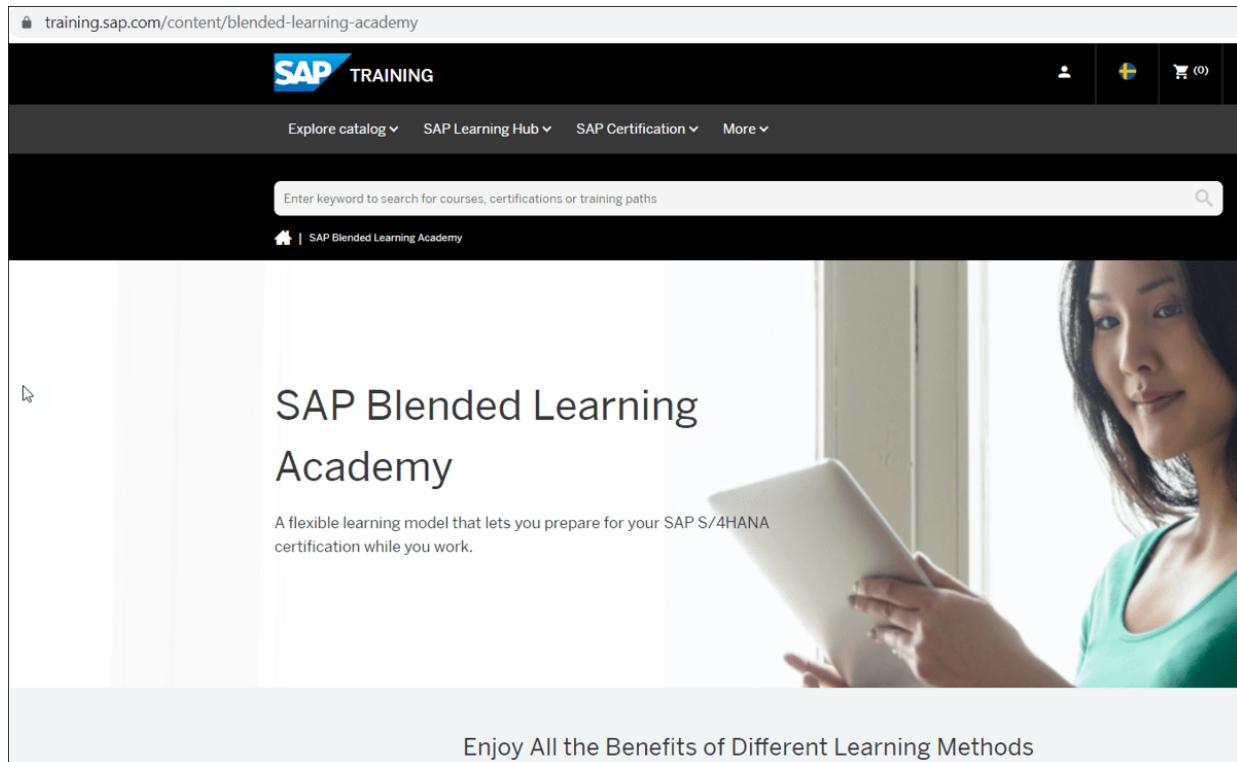


Figure 8 SAP Blended Learning Academy

The screenshot shows the SAP TRAINING website interface. At the top, there is a navigation bar with links for 'Explore catalog', 'SAP Learning Hub', 'SAP Certification', and 'More'. Below the navigation bar is a search bar with the placeholder 'Enter keyword to search for courses, certifications or training paths'. A magnifying glass icon is located to the right of the search bar. The main content area displays a course titled 'Manufacturing in SAP S/4HANA (PP) - SAP Blended Learning Academy'. Above the title, there is a breadcrumb navigation showing 'Home | Courses & Curricula | Manufacturing in SAP S/4HANA (PP) - SAP Blended Learning Academy'. Below the title, the course code 'WS4HPP' is displayed. The course details section includes the following information:

| | |
|-------------------|-----------------------------|
| Delivery Methods: | Virtual Training |
| Duration: | 5 days |
| Level: | Consultant Academy Training |
| Languages: | English |

Figure 9 WS4HPP: Manufacturing in SAP S/4HANA (PP) from the SAP Blended Learning Academy



Oct 19 2021 | Logged in as : Sample

SAP S/4HANA Production Planning and Manufacturing (C_TS422)

8 of 10

A material in your company is planned with planning strategy 70 (Planning at assembly level). The consumption mode has been set to backward with a consumption period of 12 days. Starting from when are the 12 days counted backwards?

- From the requested delivery date of the related finished good
- From the availability date of the related finished good
- From the planned independent requirement date of the material
- From the dependent requirement ^{date} of the material

Figure 10 Multiple-Choice Question Example



Oct 19 2021 | Logged in as : Sample

SAP S/4HANA Production Planning and Manufacturing (C_TS422)

9 of 10

Which material master data can you copy when you use the Copy Material program (transaction MMCC, Material Master Copier) to create new materials?

Note: There are 2 correct answers to this question.

- Storage location data
- Warehouse number data
- MRP area data
- Production version data

Figure 11 Multiple-Selection Question Example 1



Consultant Certification

Oct 19 2021 | Logged in as : Sample

SAP S/4HANA Production Planning and Manufacturing (C_TS422)

10 of 10

You are creating a production order manually.

What activities are involved in this process?

Note: There are 3 correct answers to this question.

- Planning selection
- Master data selection
- Capacity requirements determination
- Order type determination
- Actual cost calculation

Figure 12 Multiple-Selection Question Example 2

The screenshot shows the SAP Help Portal interface for SAP S/4HANA 2020 Latest. At the top, there's a navigation bar with links for 'Browse by Product', 'SAP Learning Journeys', and a search icon. Below the header, a banner states: 'With SAP S/4HANA (SAP Business Suite 4 SAP HANA), SAP is providing a new product and a next generation of business applications – simple enterprise software for big data and designed to help you run simple in the digital economy.' A search bar with placeholder text 'Enter keywords or a product name' and a magnifying glass icon is positioned above a menu bar. The menu bar includes 'Discover', 'What's New', 'Implement', 'Integrate', 'Use', 'Learn and Get Certified', and a 'See all' link. To the right of the menu is a user profile icon. The main content area is divided into several sections: 'Feature Scope Description' (with a PDF link), 'Getting Started Guide' (with a PDF link), 'Product Assistance' (with links for English and Deutsch (German)), 'SAP Best Practices' (with a PDF link), and 'SAP Notes' (listing 'Documentation Correction Note', 'Release Information Note', and 'Release Restriction Note'). There are also links for 'Discover SAP S/4HANA', 'SAP S/4HANA Trials', and 'FAQs on SAP S/4HANA and SAP HANA 2.0'.

Figure 13 SAP Help Portal

The screenshot shows the SAP Help Portal interface. At the top, there's a dark header bar with the SAP logo and "SAP Help Portal". Below it, a secondary header bar has "Home >" on the left and "English ▾" on the right. The main content area is titled "SAP Glossary". On the left, there's a sidebar with several terms listed under "Production Orders": "actual start", "Assign Work", "CO production order", "completion performance to production order complete date", "Confirm Production Operation", "confirmation", "control instructions", and "cross-plant and multi-language XStep repository". To the right of this sidebar, a vertical grey bar separates the glossary from the detailed definition of "Confirm Production Operation". The definition is titled "Confirm Production Operation" and includes the subtext "Production Orders (PP-SFC)". It also contains a short description: "An app that allows a production operator in discrete manufacturing to partially or completely confirm production operations."

actual start Production Orders
Assign Work Production Engineering and Operations
CO production order Product Cost Controlling
completion performance to production order complete date
Digital Manufacturing Insights
Confirm Production Operation Production Orders
confirmation Production Planning and Control
control instructions Production Orders
cross-plant and multi-language XStep repository
Production Planning for Process Industries

Confirm Production Operation
Production Orders (PP-SFC)

An app that allows a production operator in discrete manufacturing to partially or completely confirm production operations.

Figure 14 SAP Glossary

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Figure 15 openSAP

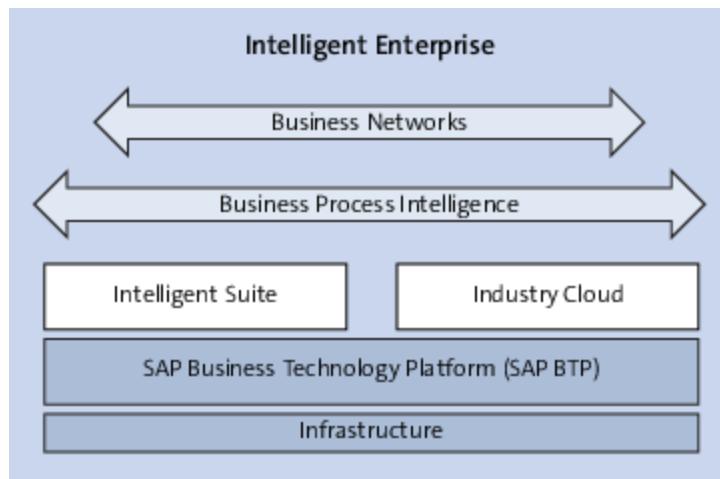


Figure 1.1 Intelligent Enterprise Framework

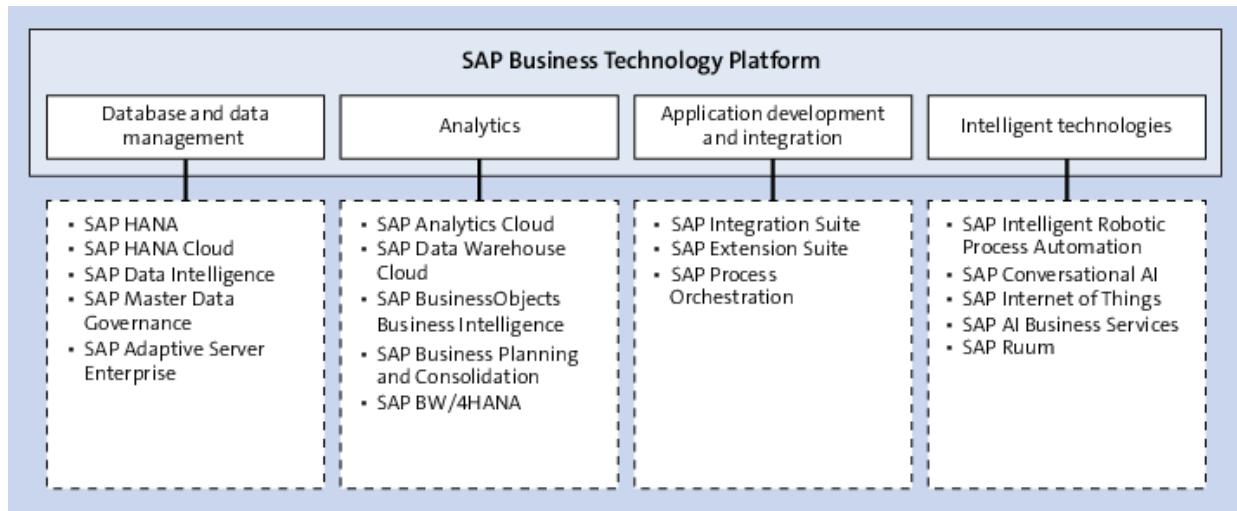


Figure 1.2 SAP Business Technology Platform and Components

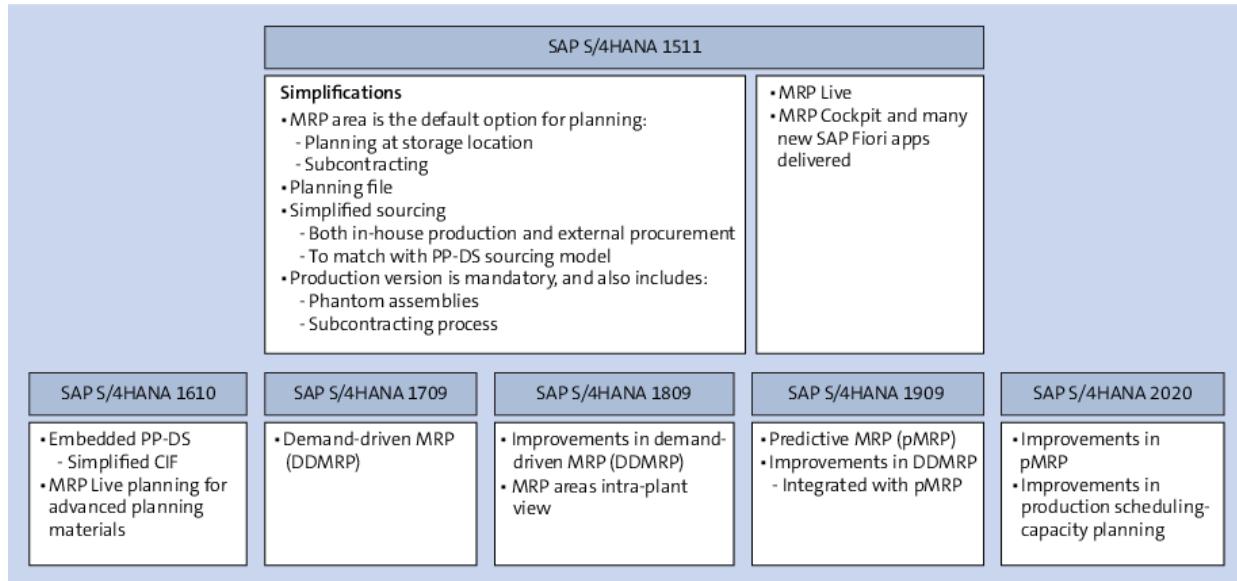


Figure 1.3 Evolution of Production Planning in SAP S/4HANA

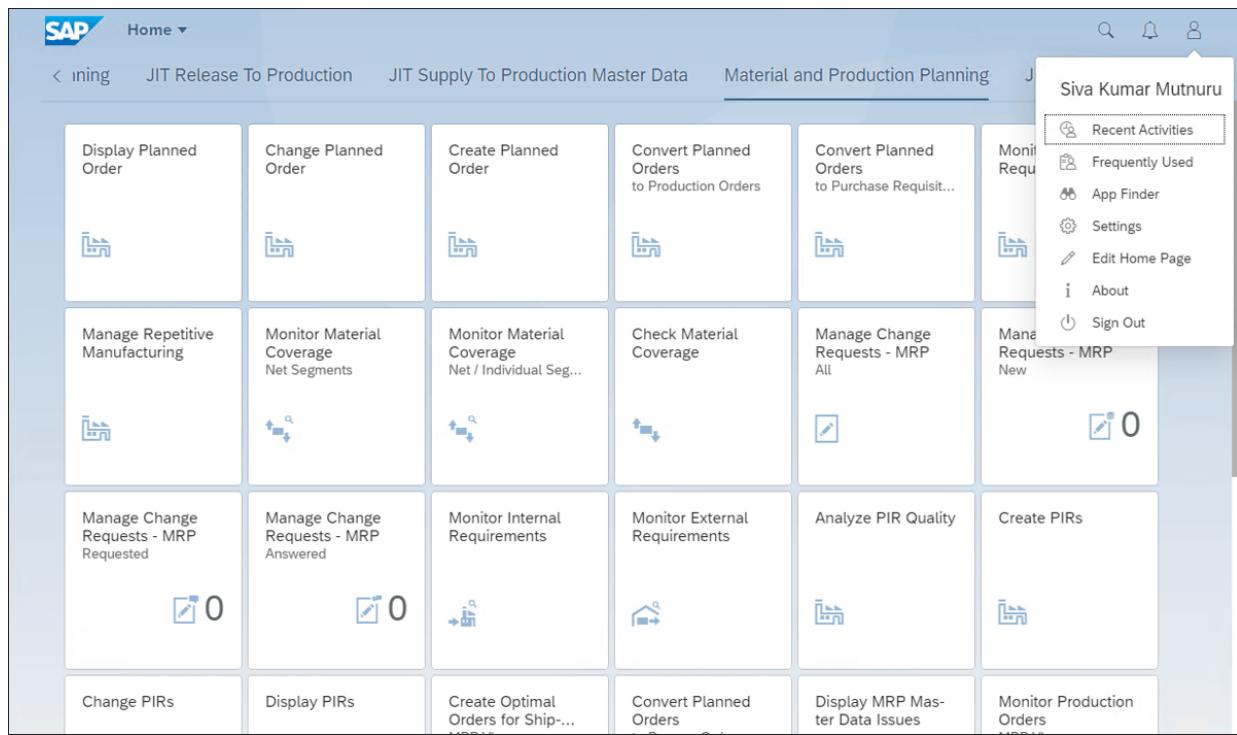


Figure 1.4 SAP Fiori Launchpad: User Actions Menu

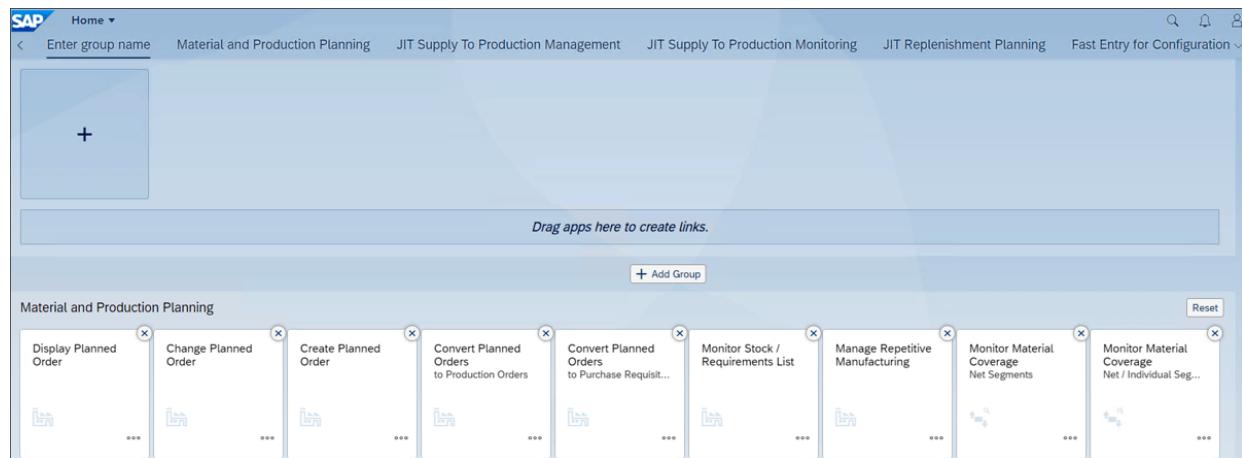


Figure 1.5 Editing the Home Page of SAP Fiori Launchpad

The screenshot shows the SAP Manage Production Orders application interface. At the top, there are search and filter fields for Status (Delivered), Issue Type (No Filter), Delay Duration (>= 0 Hours), Order (TS422*), Material (TS422*), and Scheduled Start. Below the header is a table titled "Orders (4)" with columns: Order, Material, Open Quantity, Status, Start, End, Progress of Operation, and Issues.

| | Order | Material | Open Quantity | Status | Start | End | Progress of Operation | Issues |
|--------------------------|---------|--|---------------|---------------------|----------------------------|----------------------------|-----------------------------|--------|
| <input type="checkbox"/> | 1000323 | TS422_FG101 Finished Material-TS422_FG101 | 10 PC | Partially Confirmed | Tue, Sep 14, 2021 00:38 | Tue, Sep 14, 2021 16:00 | Assembly (0010) 1 of 10 | > |
| <input type="checkbox"/> | 1000121 | TS422_SFG100 TS422_Subassembly | 1 PC | Released | Tue, Feb 23, 2021 07:00 | Tue, Feb 23, 2021 07:33 | Assembly (0010) 0 of 1 | > |
| <input type="checkbox"/> | 1000306 | TS422_FG101 Finished Material-TS422_FG101 | 500 PC | Created | Tue, Sep 7, 2021 07:00 | Sat, Sep 11, 2021 09:03 | Assembly (0010) 0 of 500 | > |
| <input type="checkbox"/> | 1000305 | TS422_FG101 Finished Material-TS422_FG101 | 500 PC | Created | Mon, Sep 6, 2021 07:00 | Fri, Sep 10, 2021 09:03 | Assembly (0010) 0 of 500 | > |

Figure 1.6 Transactional App: Manage Production Orders App

SAP Monitor Production Orders

Standard * ▾

Shortage Definition: * Order Status: Component Coverage: Material: Material Delay: Delay In Process:

MRP Standard All TS422_FG101 All All

Order:

Production Orders (3)

| <input type="checkbox"/> | Status | Material | Start | End | Open Quantity | Order Status | Material Delay (Working Days) | Missing Components | Component Coverage (Working Days) | Delay In Process (Working Days) |
|--------------------------|--------------------|-------------------------------|------------|------------|---------------|--------------|-------------------------------|--------------------|-----------------------------------|---------------------------------|
| <input type="checkbox"/> | TS422_FG101 | Finished Material-TS422_FG101 | 06.09.2021 | 10.09.2021 | 500 pc | Created | 205 | 5 | 47 days late | 47 |
| <input type="checkbox"/> | TS422_FG101 | Finished Material-TS422_FG101 | 07.09.2021 | 11.09.2021 | 500 pc | Created | 295 | 5 | 46 days late | 46 |
| <input type="checkbox"/> | TS422_FG101 | Finished Material-TS422_FG101 | 14.09.2021 | 15.09.2021 | 10 pc | In Progress | 47 | 4 | 39 days late | 30 |

Figure 1.7 Analytical App: Monitor Production Orders

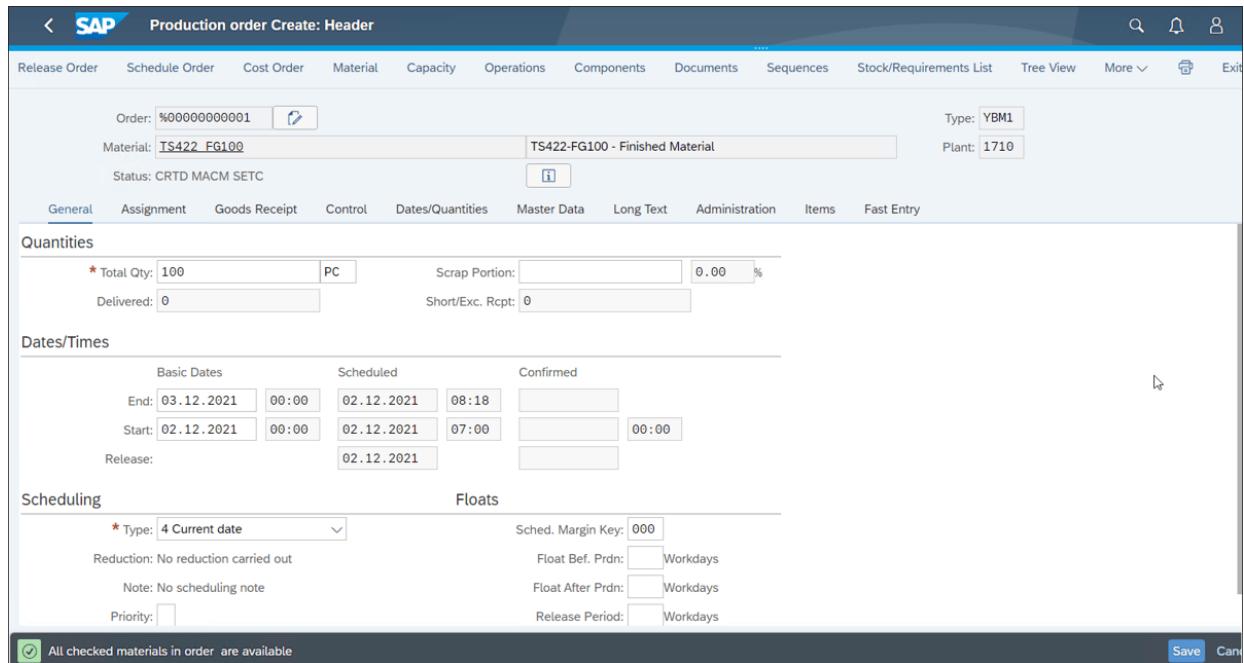


Figure 1.8 Access SAP GUI Transaction CO01 Directly in the SAP Fiori Launchpad

The image consists of two screenshots of the SAP Best Practices Explorer interface.

Top Screenshot (Dashboard):

- SAP Best Practices Explorer** header.
- Navigation:** Solution Packages, My Areas, Useful Links.
- Widgets:**
 - Complete Portfolio: 31 Solution Packages
 - SAP S/4HANA: 12 Solution Packages
 - With SAP Solution Manager 7.2: 4 Solution Packages
 - What's New: 2 Solution Packages
 - Cloud Release Assessment and Scope Dependency: Tools
- MY AREAS:**
 - SAP Solution Manager 7.2 Basket: 2 Solution Packages
 - Favorites: 1 Solution Packages

Bottom Screenshot (Detailed Package Page):

- Breadcrumbs:** Browse Packages / SAP S/4HANA / On-Premise /
- Title:** SAP Best Practices for SAP S/4HANA (on premise) Sweden, SAP S/4HANA 2020
- Image:** Circular icon showing two people.
- Description:** Accelerate and simplify the path to SAP S/4HANA (on premise) for faster time to value with SAP Best Practices that are tailored specifically to simplify the adoption of SAP S/4HANA.
- Metadata:**
 - Version: Sweden, SAP S/4HANA 2020
 - Language: English
 - Direct link to package: https://rapid.sap.com/bp/BP_OP_ENTPR
- Navigation:** Overview (selected), Solution Scope, Accelerators, Find Out More.
- Content:**
 - SOLUTION SCOPE:** Scope Item Groups
 - Name:** Finance
 - Description:** Achieve excellence in financial management & accounting with regulatory compliance financial insight at any time, from anywhere using best practices and machine learning.

Figure 1.9 SAP Best Practices for SAP S/4HANA

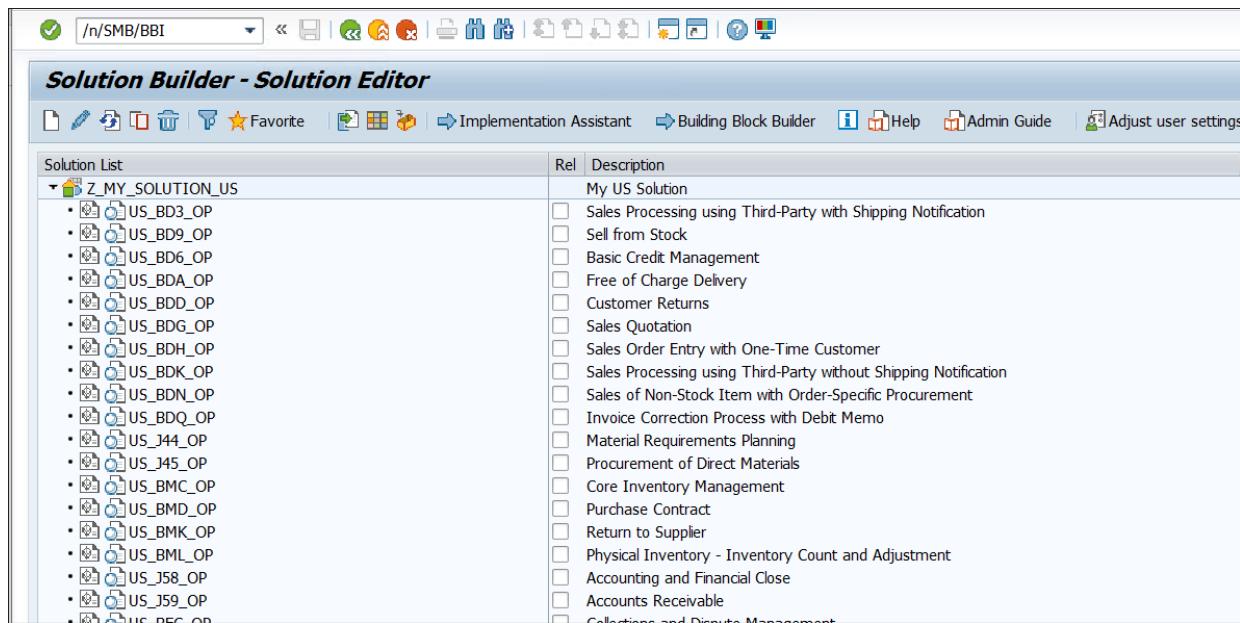


Figure 1.10 SAP Best Practices: Solution Builder

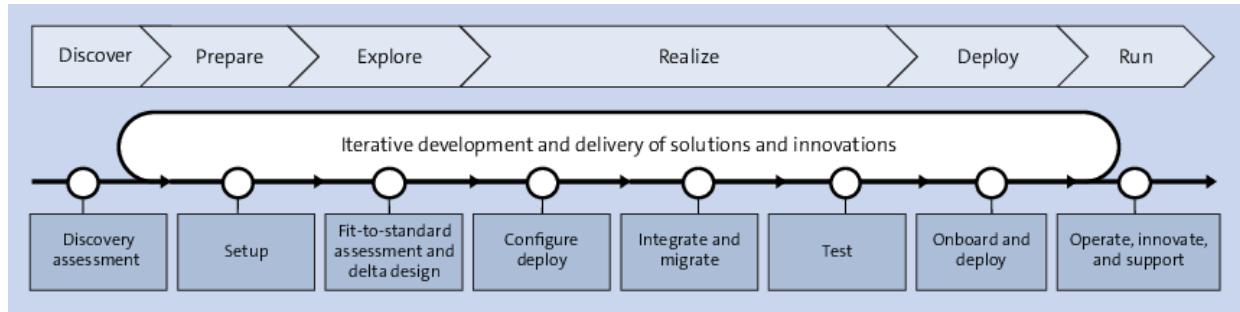


Figure 1.11 SAP Activate Methodology

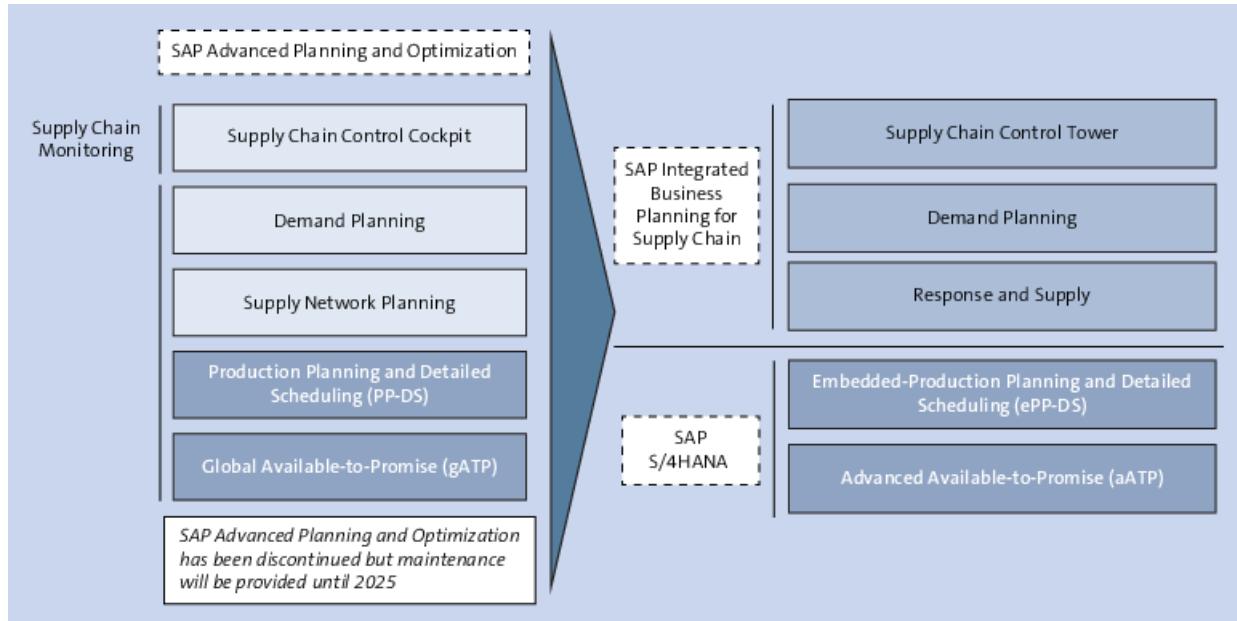


Figure 1.12 Transfer of Modules from SAP Advanced Planning and Optimization to SAP IBP

The screenshot displays the SAP IBP Web Interface with a grid of planning modules. The top navigation bar includes links for My Home, Demand Planning, Supply Planning, Order Based Planning, Account Planner, Order-Based Planning Configuration, General Planner, Intelligent Visibility, General Response Planner, Demand Planner, Administrator, Demand-Driven Replenishment Planner, Model Configuration, Supply Planner, Inventory Planner, and Help.

Demand Planning:

- S&OP Planning Area (IBSOP1): Unified Planning Area
- Analytics Advanced
- Dashboards Advanced
- Application Jobs
- Application Job Templates
- Data Integration Jobs: 0 Fatal Errors
- Copy Operator Profiles
- Manage User Permissions
- DP - Planning Area (IBSOP1)
- Web-Based Planning
- Manage Process Templates
- Manage Processes

Demand Planning Sub-modules:

- Web-Based Planning Customers
- Manage Product Lifecycle
- Manage Forecast Models
- Assign Forecast Models
- Manage Lag-Based Snapshots
- Settings for Product Lifecycle
- Time Aggregation Profiles

Supply Planning:

- Intelligent Visibility
- S&OP Operator Profiles
- Manage Master Data
- Intelligent Visibility Profiles
- Manage Versions and Scenarios
- Web-Based Planning Suppliers
- Forecast Consumption Profiles TS Survey Planning: 2 Profiles
- Inventory Analysis
- Inventory Profiles

Order Based Planning:

OBP Planning Area (IBSOBP): NTT DATA IBS Order...

| Configure Remote Sources Smart Data Integration: 3 | View Demands by Priority | Projected Stock | Driver-Based Planning: 0 | View Gating Factors | Planning Calendars: 1493 | Define Sequence of Sort Attribute Value: 8 | Application Jobs Order-Based Planning: 1 | Fair-Share Set Profiles: 2 | Forecast Consumption Profiles Order-Based Planning: 2 | View Location Materials | View Locations |
|--|---------------------------------|-----------------|--------------------------|----------------------|--|--|--|----------------------------|---|-------------------------|----------------|
| View Materials | View Production Data Structures | View Resources | View Confirmations | Simulate Sales Order | Source of Supply Selection Profiles: 2 | View Suppliers | Analyze Supply Usage | View Transportation Lanes | | | |

Figure 1.13 SAP IBP Web Interface

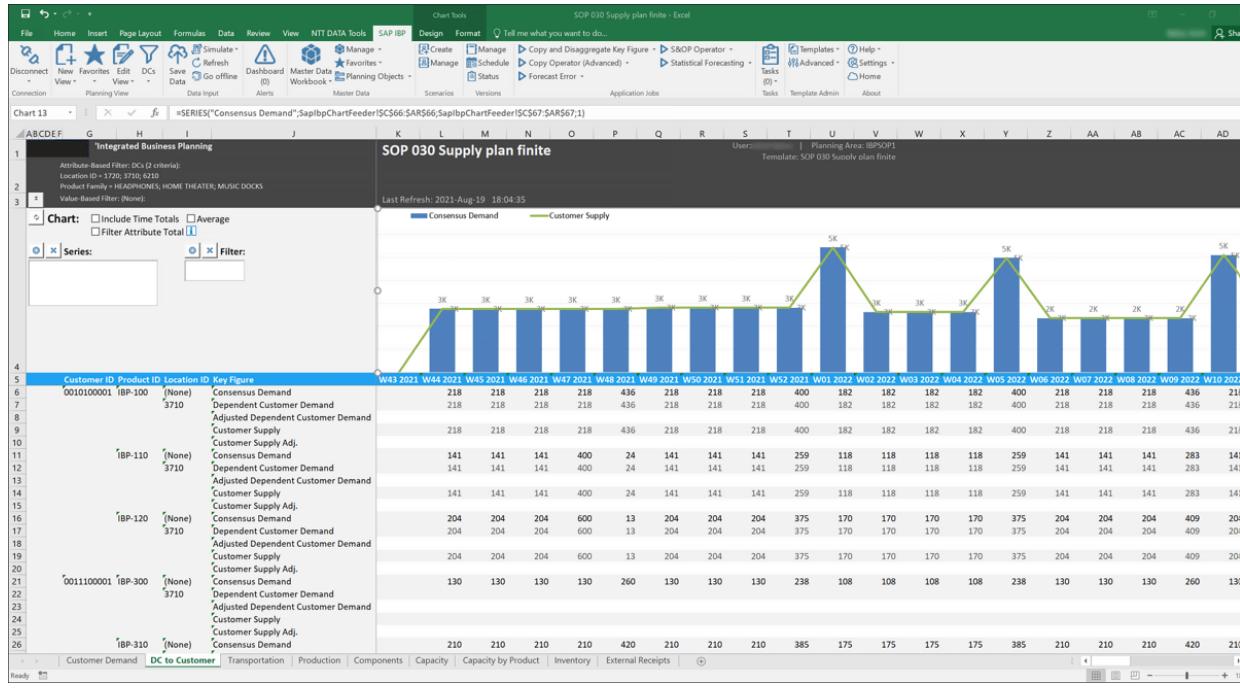


Figure 1.14 SAP IBP Planning View in Excel

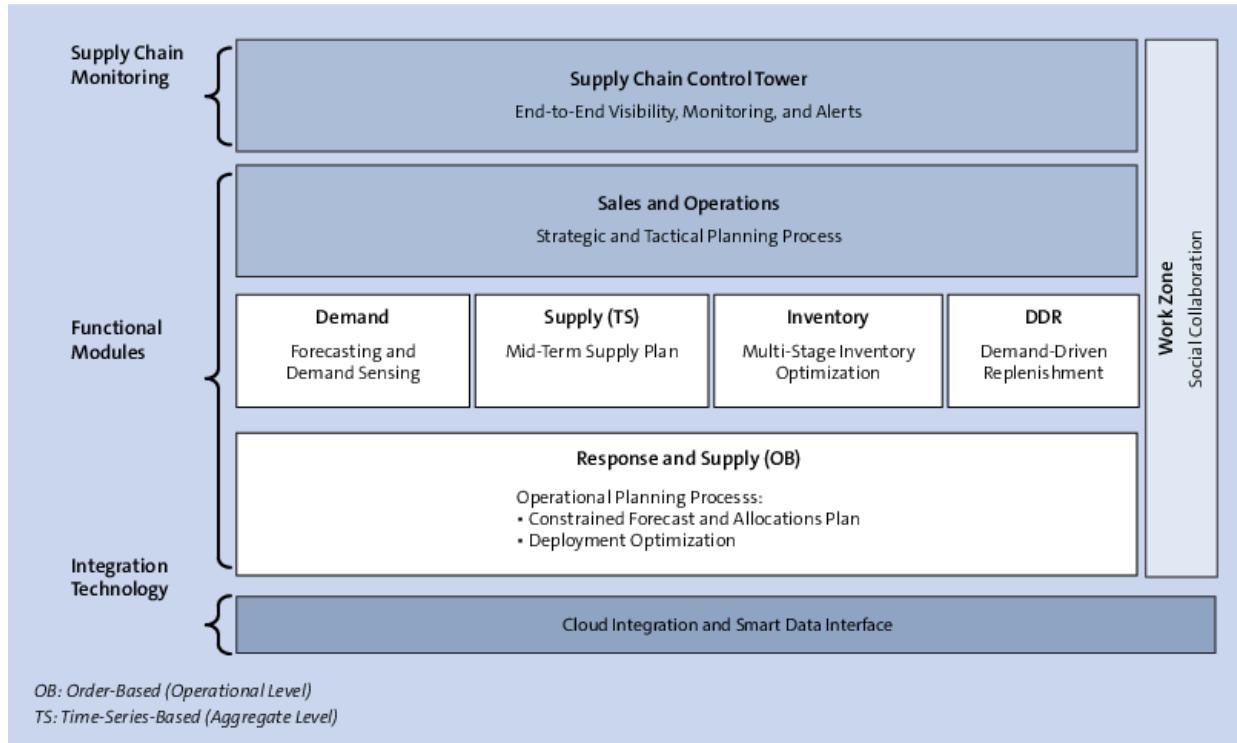


Figure 1.15 SAP IBP Landscape and Modules Offered

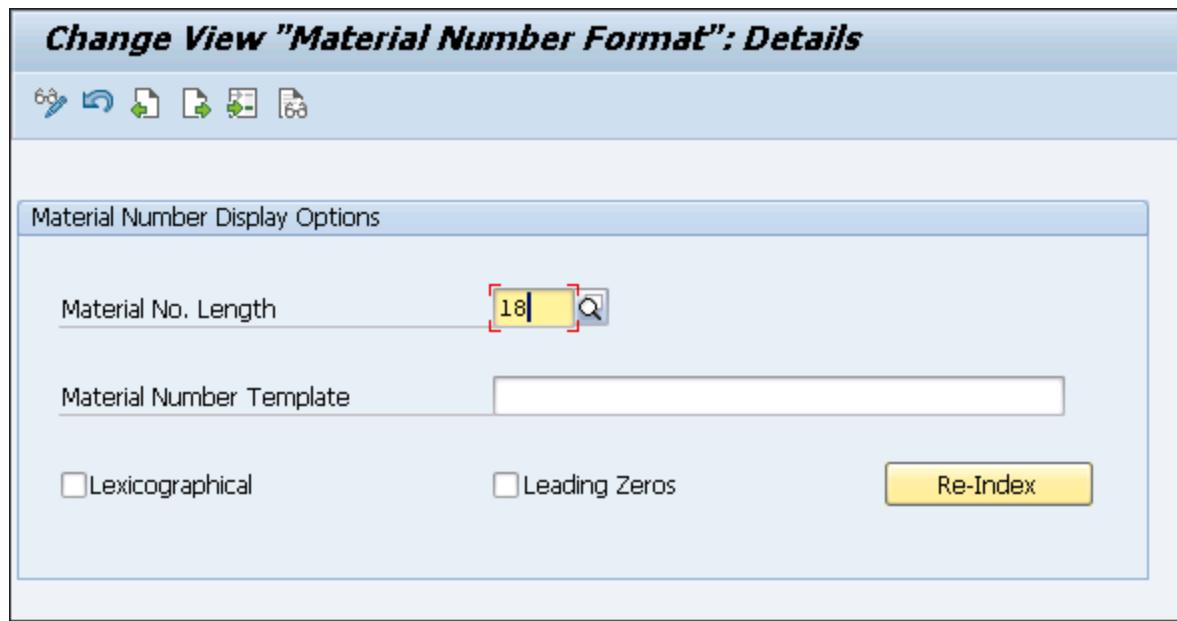


Figure 2.1 Material Number Format

Change View "Material types": Details

New Entries

| | |
|---|--|
| Dialog Structure | Material type <input type="text" value="HALB"/> Semifinished Product <input checked="" type="checkbox"/> Product Type Group <input type="checkbox"/> |
| General data | |
| Field reference <input type="text" value="HALB"/> X-Plant Mat.Status <input type="checkbox"/> | |
| SRef: material type <input type="text" value="ROH"/> Item category group <input type="checkbox"/> | |
| Authorization group <input type="text"/> With Qty Structure <input checked="" type="checkbox"/> | |
| External no. assignment w/o check <input checked="" type="checkbox"/> Initial Status <input type="checkbox"/> | |
| Concatenated Material No. <input type="text" value="Disable"/> | |
| Special material types | |
| Material is configurable <input type="checkbox"/> | |
| Material f. process <input type="checkbox"/> | |
| Pipeline mandatory <input type="checkbox"/> | |
| Mand. RP logistics <input type="checkbox"/> | |
| Manufacturer part <input type="checkbox"/> | |
| FFF Class <input type="checkbox"/> | |
| Internal/external purchase orders | |
| Ext. Purchase Orders <input type="text" value="2"/> | |
| Int. purchase orders <input type="text" value="2"/> | |
| Classification | |
| Class type <input type="text"/> | |
| Class <input type="text"/> | |
| User departments | |
| Status description | |
| Work scheduling | |
| Accounting | |
| Classification | |
| MRP | |
| Purchasing | |
| Production resources/tools | |
| Costing | |
| Basic data | |
| Storage | |
| Forecasting | |
| Valuation | |
| Price control <input type="text" value="S Standard price"/> | |
| Acct cat. reference <input type="text" value="0008"/> Price Ctrl.Mandatory <input type="checkbox"/> | |
| Quantity/value updating | |
| Quantity updating | |
| In all valuation areas <input type="checkbox"/> Value updating | |
| In no valuation area <input type="checkbox"/> | |
| By valuation area <input checked="" type="checkbox"/> | |
| In all valuation areas <input type="checkbox"/> | |
| In no valuation area <input type="checkbox"/> | |
| By valuation area <input checked="" type="checkbox"/> | |
| Retail-specific fields | |
| Material Type ID <input type="text" value="General material type"/> | |
| Time till deleted <input type="text"/> | |
| Display material <input type="checkbox"/> Print price <input type="checkbox"/> | |

Figure 2.2 Attributes for Material Types

SAP Create Material (Initial Screen)

Material: TS422_FG103

Industry Sector: M Mechanical engineering

Material type: FERT Finished Product

Change Number: []

Copy from...

Material: []

1 Select View(s)

View

- Basic Data 1
- Basic Data 2
- Classification
- Sales: Sales Org. Data 1
- Sales: Sales Org. Data 2
- Sales: General/Plant Data
- Extend SPP Basic Data
- International Trade: Export
- Sales Text
- MRP 1
- MRP 2
- MRP 3
- MRP 4
- Advanced Planning
- Extended SPP
- Forecasting
- Work Scheduling
- General Plant Data / Storage 1
- General Plant Data / Storage 2
- Production Resources/Tools
- Warehouse Management 1
- Warehouse Management 2

View selection only on request

Create views selected

2 Organizational Levels

Plant: 1710 | Plant 1 US

Stor. Loc.: 171A | Std. storage 1

Profiles

MRP profile: []

Org. levels/profiles only on request

3 Basic data 1

Material: TS422_FG103

Descr.: TS422_Finish Goods 103

General Data

* Base Unit of Measure: PC Piece Material Group: []

Old material number: [] Ext. Matl Group: []

Division: [] Lab/Office: []

Product allocation: [] Prod.hierarchy: []

X-Plant Mat.Status: [] Valid from: []

Assign effect. vals: GenItemCatGroup: []

Material authorization group

Authorization Group: []

Dimensions/EANs

Gross weight: 1024 Weight unit: KG

Net weight: 980

Volume: [] Volume unit: []

Size/dimensions: []

EAN/UPC: [] EAN category: []

Packaging material data

Matl Grp Pack.Matls: []

Ref_mat_for_packer: []

Figure 2.3 Create Material Master

| | |
|---|------------------------------|
| - | Folder Material Master |
| - | Folder Material |
| - | Folder Create (Special) |
| • | MMR1 - Raw Material |
| • | MMB1 - Semifinished Product |
| • | MMF1 - Finished Product |
| • | MMI1 - Operating Supplies |
| • | MMH1 - Trading Goods |
| • | MMU1 - Non-Valuated Material |
| • | MMN1 - Non-Stock Material |
| • | MMV1 - Packaging |
| • | MML1 - Empties |
| • | MMS1 - Service(s) |
| • | MMK1 - Configurable Material |
| • | MMP1 - Maintenance Assembly |
| • | MMW1 - Competitor Product |
| • | MMG1 - Returnable Packaging |
| - | Folder Create (General) |
| • | MM01 - Immediately |
| • | MM11 - Schedule |

Figure 2.4 Transaction Codes to Create the Material Master



Figure 2.5 Create Material App

Select View(s) X

| View | | |
|--|--|--|
| <input checked="" type="checkbox"/> Basic Data 1 | | |
| <input checked="" type="checkbox"/> Basic Data 2 | | |
| <input type="checkbox"/> Classification | | |
| <input checked="" type="checkbox"/> Sales: Sales Org. Data 1 | | |
| <input checked="" type="checkbox"/> Sales: Sales Org. Data 2 | | |
| <input checked="" type="checkbox"/> Sales: General/Plant Data | | |
| <input type="checkbox"/> Extendend SPP Basic Data | | |
| <input type="checkbox"/> International Trade: Export | | |
| <input type="checkbox"/> Sales Text | | |
| <input type="checkbox"/> Purchasing | | |
| <input type="checkbox"/> International Trade: Import | | |
| <input type="checkbox"/> Purchase Order Text | | |
| <input checked="" type="checkbox"/> MRP 1 | | |
| <input checked="" type="checkbox"/> MRP 2 | | |
| <input checked="" type="checkbox"/> MRP 3 | | |
| <input checked="" type="checkbox"/> MRP 4 | | |
| <input checked="" type="checkbox"/> Advanced Planning | | |
| <input type="checkbox"/> Extended SPP | | |
| <input type="checkbox"/> Forecasting | | |
| <input checked="" type="checkbox"/> Work Scheduling | | |
| <input checked="" type="checkbox"/> General Plant Data / Storage 1 | | |
| <input checked="" type="checkbox"/> General Plant Data / Storage 2 | | |

View selection only on request

Create views selected

✓ Org. Levels Data Default Setting ✖

Figure 2.6 Material Master: Create Views Selected Checkbox

Copy Material

Reference Material: TS422_FG103

Number of New Materials: 1

Test Run

Do Not Change Existing Data

Apply User Setting

Data to Be Copied

Basic Data

Plant Data

Storage Location Data

SD Data

Warehouse Number Data

Storage Type Data

Valuation data

Filter Settings

| | | | | |
|----------------------|------|----|-----|-----|
| Plant | 1710 | to | [] | [] |
| Storage Location | [] | to | [] | [] |
| Sales Organization | [] | to | [] | [] |
| Distribution Channel | [] | to | [] | [] |
| Warehouse number | [] | to | [] | [] |
| Storage Type | [] | to | [] | [] |
| Valuation Area | [] | to | [] | [] |

Figure 2.7 Transaction MMCC: Copy Material

Change Material TS422_FG105 (Finished Product)

Additional Data Org. Levels Check Screen Data

Basic data 1 Basic data 2 Sales: sales org. 1 Sales: sales org. 2 Sales: General/Plant Ext. ...

| | | | | |
|----------------------|------------------------------|------------|---|--------------------|
| Material | TS422_FG105 | | <input type="button" value="I"/> | |
| Descr. | Finished Product TS422_FG105 | | <input type="button" value="S"/> <input type="button" value="D"/> | |
| General Data | | | | |
| Base Unit of Measure | PC | Piece | Material Group | I004 |
| Old material number | | | Ext. Matl Group | |
| Division | 00 | Lab/Office | | |
| Product allocation | | | Prod.hierarchy | |
| X-Plant Mat.Status | | | Valid from | |
| Assign effect. vals | | | GenItemCatGroup | NORM Standard item |

Change Material TS422_FG105 (Finished Product)

Main Data

Descriptions Units of measure Additional EANs Document data Basic data text Inspection text

| Material | TS422_FG105 | | <input type="button" value="I"/> | | | | |
|----------------------------------|------------------------------|-----------|---|----|-------|-----------|---------|
| Descr. | Finished Product TS422_FG105 | | <input type="button" value="S"/> <input type="button" value="D"/> | | | | |
| Units of measure grp | | | | | | | |
| Units of measure/EANs/dimensions | | | | | | | |
| X | AUUn | Measur... | <... | Y | BUn | Measur... | EAN/UPC |
| 1 | PC | Piece | <... 1 | PC | Piece | | |
| 1 | EA | each | <... 1 | PC | Piece | | |

Descriptions
 • Units of measure
 Additional EANs
 Document data
 Basic data text
 Inspection text
 Internal comment
 Consumption

Figure 2.8 Material Master: Additional Data

Logistics - General

- ↳ Product Lifecycle Management (PLM)
- ↳ Portal
- ↳ **Material Master**
- ↳ Product Master Hierarchy - Media
- ↳ Configuring the Material Master
- ↳ Field Selection
- ↳ Basic Settings
- ↳ **Settings for Key Fields**
- Define Material Groups
- Maintain External Material Groups
- Define Divisions
- Define Material Statuses
- Extend ABC Indicator
- Define Laboratories and Offices
- Define Basic Materials
- Define Storage Conditions
- Define Temperature Conditions
- Define Container Requirements
- **Define Units of Measure Groups**
- Define PKWÜ Classification for Poland
- ↳ International Article Numbers (EANs)
- ↳ Data Relevant to Sales and Distribution

New Entries: Overview of Added Entries

| Unit group | Alt. Unit | Measurement unit text | Numerator | Denominat. |
|------------|-----------|-----------------------|-----------|------------|
| 01 | BOX | Packed Box | 4 | 1 |
| 01 | CAR | Carton | 12 | 1 |
| 01 | PAL | Pallet | 72 | 1 |

Figure 2.9 Material Master: Units of Measure Groups

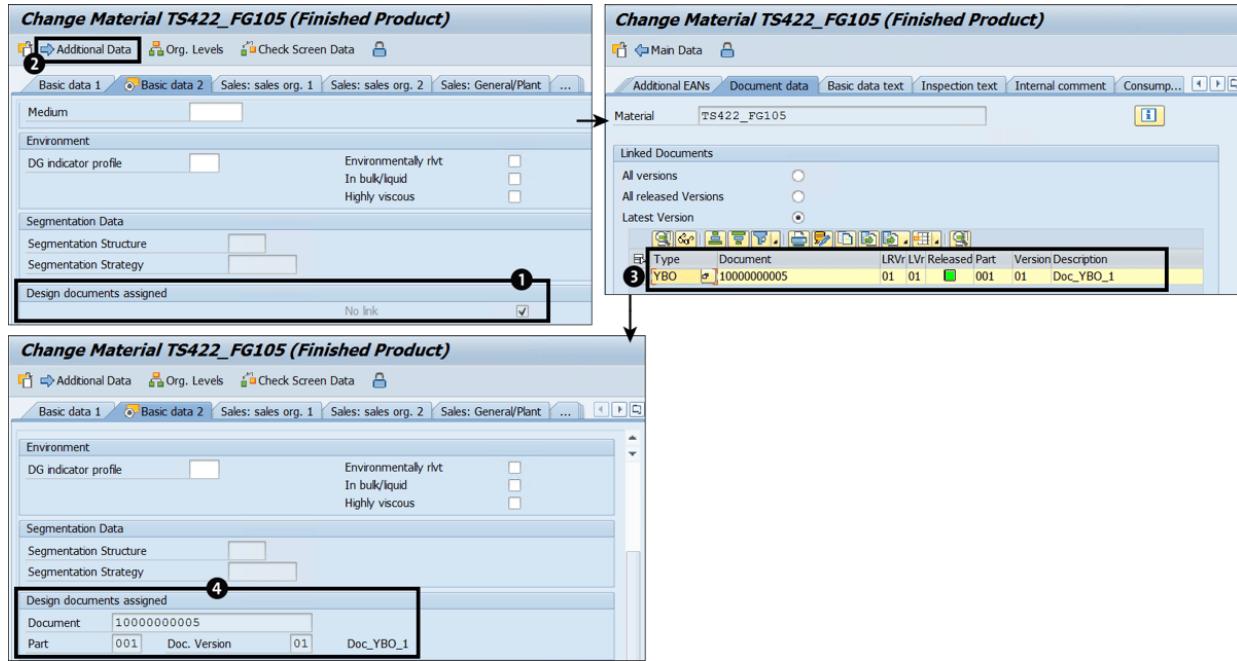


Figure 2.10 Material Master: Document Data

SAP Change Characteristic

Other Characteristic... Last Characteristic More ▾

Characteristic: ZCOLOUR

Change Number:

Valid From: 11.08.2021

Basic data Descriptions Values Addnl data Restrictions

Basic data

Description: ZCOLOUR

Char. Group:

* Status: 1 Released

Auth. Group:

Format **Value Assignment**

Data Type: CHAR Character Format

Single Value
 Multiple Values

Number of Chars: 30

Case Sensitive Restrictable

Template: Entry Required

Figure 2.11 Characteristic Maintenance

SAP Create Class:

Other Object Last Classes Change Language More ▾

Class: **Z_MAT_PROPERTIES**

Class type: **001 Material Class**

Change Number:

Valid from: **11.08.2021** Validity

Basic data Keywords **Char.** Texts Document Std

| Char. | Description | Data ... | Nu... | De... | Unit | Re... | Org. Areas |
|-----------------------------------|-------------|----------|-------|-------|------|-------------------------------------|------------|
| <input type="checkbox"/> ZCOLOUR | ZCOLOUR | CHAR | 30 | 0 | | <input type="checkbox"/> | |
| <input type="checkbox"/> ZDENSITY | Density | NUM | 4 | 3 | | <input checked="" type="checkbox"/> | |
| <input type="checkbox"/> ZLENGTH | Lenth | CHAR | 4 | 0 | | <input checked="" type="checkbox"/> | |
| <input type="checkbox"/> | | | | | | <input type="checkbox"/> | |
| <input type="checkbox"/> | | | | | | <input type="checkbox"/> | |

Figure 2.12 Class Maintenance

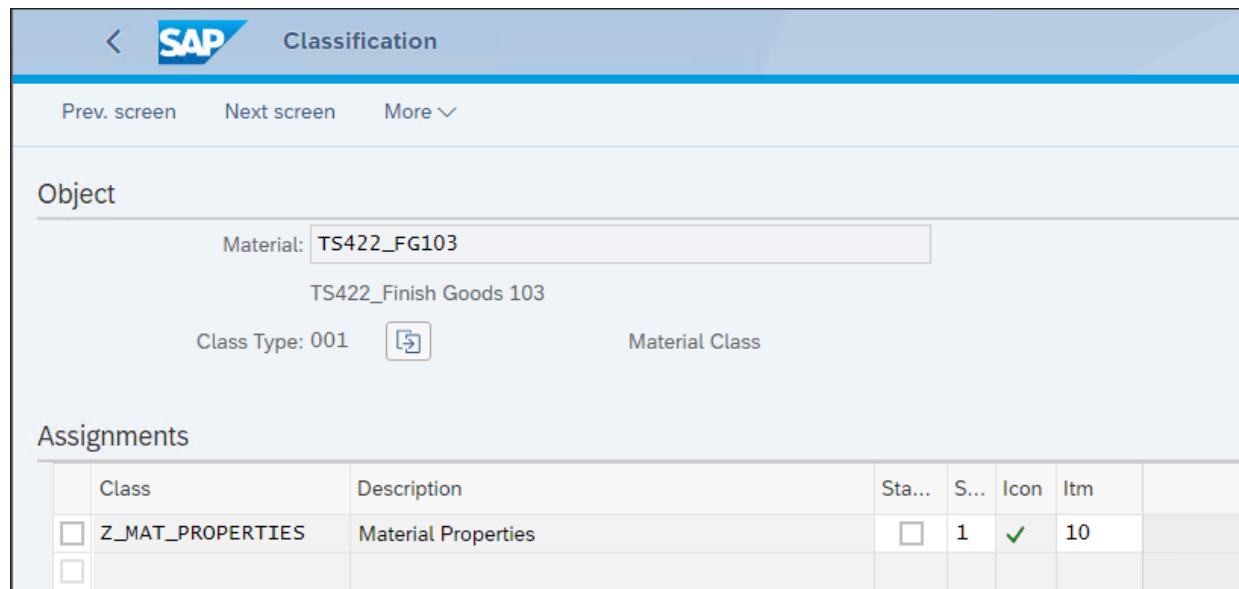


Figure 2.13 Class Assignment to the Material Master

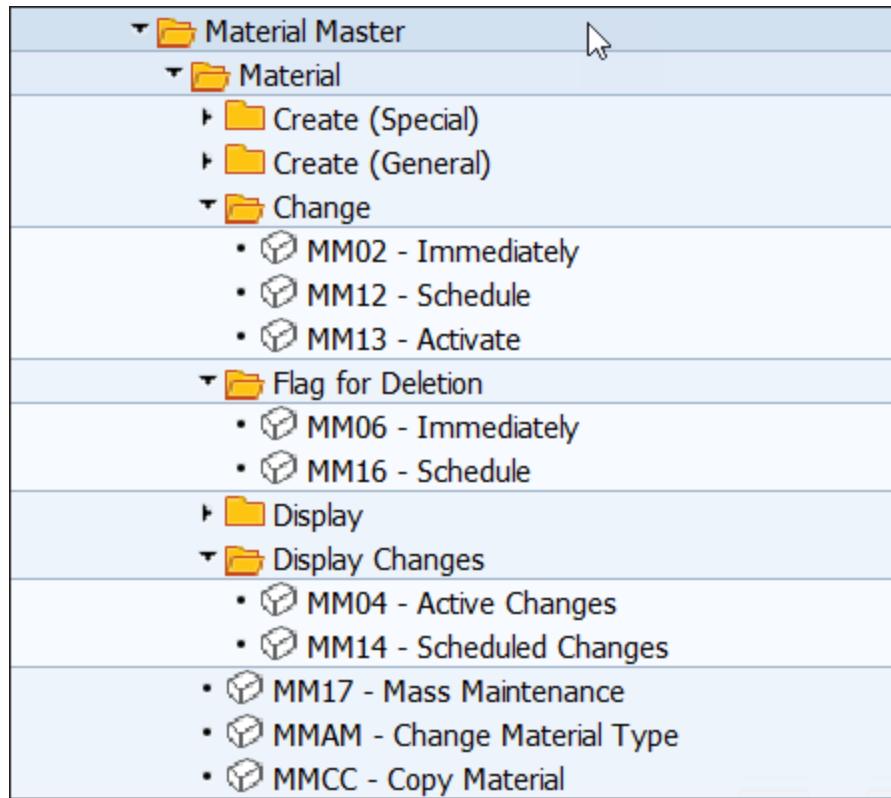


Figure 2.14 Managing Material Masters

Flag Material for Deletion: Initial Screen

| | |
|----------------|-------------|
| Material | TS422_FG103 |
| Plant | 1710 |
| Stor. Loc. | |
| Valuation Type | |
| Sales Org. | 1710 |
| Distr. Channel | 10 |
| Warehouse No. | |
| Storage Type | |
| Change Number | |

Flag Material for Deletion: Data Screen

Material TS422_FG103 TS422_Finish Goods 103

| | |
|---|--|
| Plant | <input checked="" type="checkbox"/> 1710 Plant 1 US |
| Storage location | <input type="checkbox"/> |
| Valuation Type | <input type="checkbox"/> |
| Sales organization/distribution channel | <input type="checkbox"/> 1710 Dom. Sales Org US / <input type="checkbox"/> 10 Direct Sales |
| Warehouse Number | <input type="checkbox"/> |
| Storage Type | <input type="checkbox"/> |

Flag Material for Deletion: Data Screen

Material TS422_FG103 TS422_Finish Goods 103

| | |
|---|---|
| Plant | <input checked="" type="checkbox"/> 1710 Plant 1 US |
| Storage location | <input checked="" type="checkbox"/> |
| Valuation Type | <input checked="" type="checkbox"/> |
| Sales organization/distribution channel | <input checked="" type="checkbox"/> 1710 Dom. Sales Org US / <input type="checkbox"/> 10 Direct Sales |
| Warehouse Number | <input checked="" type="checkbox"/> |
| Storage Type | <input checked="" type="checkbox"/> |

Figure 2.15 Setting the Material Master for Deletion

Change View "Define Material Statuses": Details

New entries Copy as... Delete Select

Material Status

05 Obsolete

Plant-specific settings

| | |
|-------------------------------|---------------------------------------|
| Purchasing | Production resources/tools |
| Purchasing msg. | PRT message |
| BOMs | Plant maintenance |
| BOM header msg. | Plant maint. message |
| BOM item message | |
| Routing/recipe | Inventory management |
| Routing/master recipe message | Inventory mgmt msg. |
| Material requirements | Warehouse management |
| Ind. reqmt msg. | Transfer requirement msg. |
| Forecasting message | Transfer order message |
| MRP message | |
| LT planning message | Cost estimate with quantity structure |
| | Mat. Cost Estimate Procedure |
| Production | |
| POrder header msg. | |
| PO/network item msg. | |
| Cross-plant settings | |
| ALE distribution | |
| Distr. lock | |
| Profile Name | |

Figure 2.16 Material Statuses



| Item No. | Component | Component Description | Quantity | Unit of Measure |
|----------|-----------|---------------------------|----------|-----------------|
| 0010 | BAREL01 | Barrel | 1 | PC |
| 0020 | GRIP01 | Grip | 1 | PC |
| 0030 | TIP03 | Tip | 1 | PC |
| 0040 | SPRNG01 | Spring | 1 | PC |
| 0050 | CAP04 | End cap | 1 | PC |
| 0060 | CLIP03 | Clip | 1 | PC |
| 0070 | RBIC01 | Roller ball ink cartridge | 1 | PC |

Figure 2.17 BOM of a Ballpoint Pen

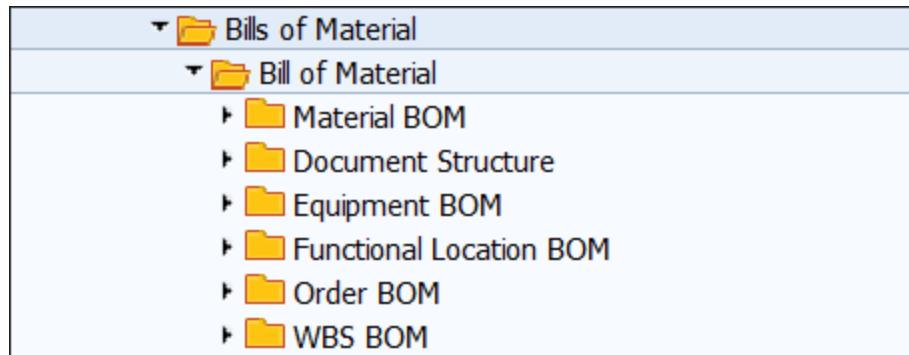


Figure 2.18 BOM Categories

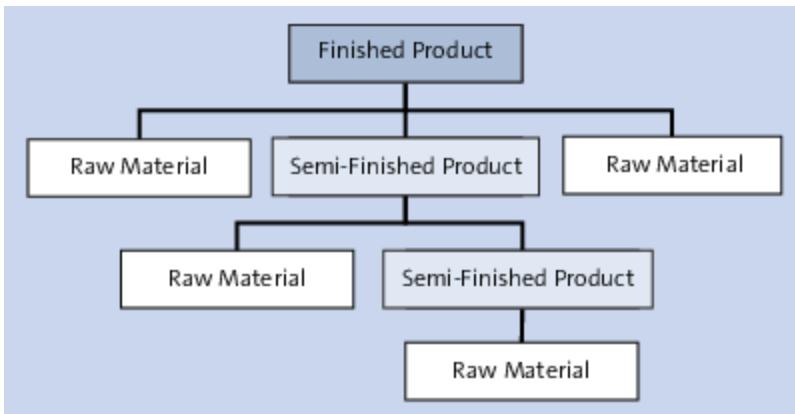


Figure 2.19 Multilevel BOM

Create material BOM: Initial Screen

Check entries Copy From ... Create variant of... More ▾

* Material: 

1 Plant: Plant 1 US

2 * BOM Usage: Production

3 Alternative BOM:

Validity

Change Number:

4 Valid From:

Revision Level:

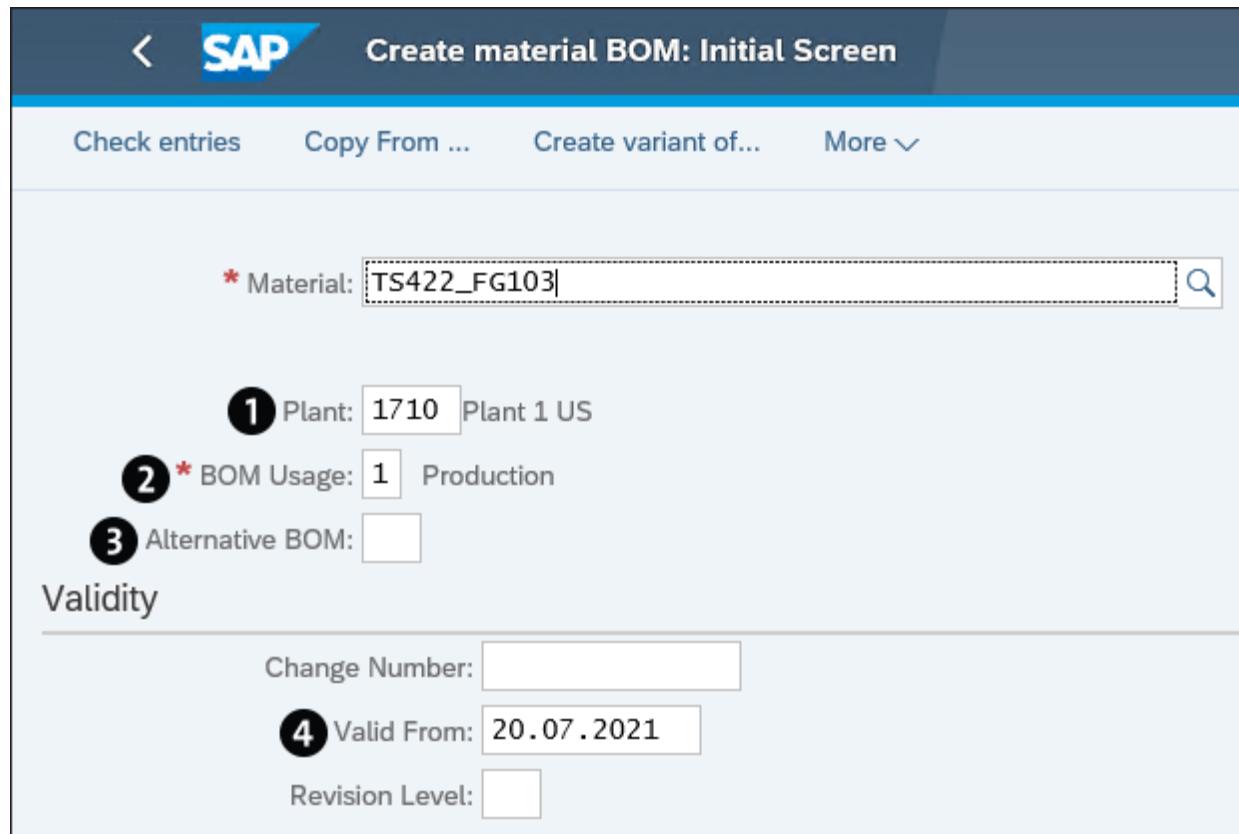


Figure 2.20 Creating a BOM

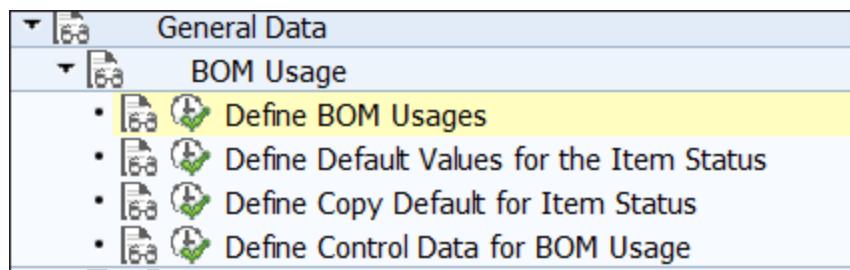


Figure 2.21 BOM Usage: Customization

| Change View "BOM Usage - Item Statuses": Overview | | | | | | | | |
|---|---------|-------|----------|-------|----|-------|---------|------------------------|
| | BOM Usg | Prod. | Eng/des. | Spare | PM | Sales | CostRel | Usage text |
| 1 | + | . | . | - | - | . | . | Production |
| 2 | . | + | . | - | - | . | . | Engineering/Design |
| 3 | . | . | . | - | . | . | . | Universal |
| 4 | - | - | . | + | - | . | . | Plant Maintenance |
| 5 | . | . | . | - | + | . | . | Sales and Distribution |
| P | + | . | . | - | - | . | . | Predictive MRP |

Figure 2.22 BOM Usage: Item Statuses

Item | BOM Long Text

| | | |
|-----------------|-------------------|------------------------|
| Material | TS422_FG103 | TS422_Finish Goods 103 |
| Plant | 1710 Plant 1 US | |
| BOM | 00000211 | |
| Alternative BOM | 1 | |
| BOM Usage | 1 Production | |
| Technical type | M Multiple BOM | |
| BOM group | TS422_FG103-GROUP | |

Quantities/Long Text Additional Data Administration Data Document Assignment

BOM and Alternative Text

| | | |
|------------------|--|--|
| BOM Description | | |
| Alternative Text | | |

Quantity Data

| | | | | |
|---------------|---|----|--|----|
| Base quantity | 1 | PC | | |
| From Lot Size | | To | | PC |

Validity

| | | | |
|--------------------|--------------------------|---------------------|--------------------------|
| Change Number | | BOM Status | 1 |
| Valid From | 20.07.2021 | Authorization group | |
| Deletion Indicator | <input type="checkbox"/> | Deletion Flag | <input type="checkbox"/> |

This screenshot shows the SAP BOM header details screen. The top section displays basic information: Material (TS422_FG103), Plant (1710 Plant 1 US), BOM (00000211), Alternative BOM (1), BOM Usage (1 Production), Technical type (M Multiple BOM), and BOM group (TS422_FG103-GROUP). Below this is a navigation bar with tabs: Quantities/Long Text (selected), Additional Data, Administration Data, and Document Assignment. The main area is divided into sections: BOM and Alternative Text, Quantity Data, and Validity. The BOM and Alternative Text section contains fields for BOM Description and Alternative Text, each with an edit icon. The Quantity Data section contains fields for Base quantity (1) and PC, and From Lot Size (with To and PC fields). The Validity section contains fields for Change Number, BOM Status (1), Valid From (20.07.2021), Authorization group, Deletion Indicator (checkbox), and Deletion Flag (checkbox).

Figure 2.23 BOM Header Details

Change View "Default Values for BOMs": Details

69

Default values

| | |
|--------------------|-------|
| Base quantity | 1,000 |
| BOM Status | 1 |
| Size unit | MM |
| Var-size item unit | PC |

Figure 2.24 BOM Default Values

Bill of Material Status (1) 3 Entries found

Restrictions

| BOM St. | MRPExpl | PlanOrd | Rel cstg | RelWkSch. | Rel ords | Coll is | SalesOrd | ExMs ID | Description of BOM status |
|---------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|---------------------------|
| 01 | <input checked="" type="checkbox"/> | Active |
| 02 | <input type="checkbox"/> | Inactive |
| 03 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Active with history reqmt |

Figure 2.25 BOM Status

| Create material BOM: General Item Overview | | | | | | | | | | | |
|--|-----------------|------------------------------|-----------------------|-------------------------|------|-------------------------------------|--------------------------|------------|------------|--|--|
| | | | | | | | | | | | |
| Material | TS422_FG103 | | | TS422_Finish Goods 103 | | | | | | | |
| Plant | 1710 Plant 1 US | | | | | | | | | | |
| Alternative BOM | 2 | | | | | | | | | | |
| Position | | Effectivity Initial Screen | | | | | | | | | |
| Material | | Document | | General | | | | | | | |
| Item | ICt | Component | Component description | Quantity | U... | Asm | SI | Valid From | Valid to | | |
| 0010 | L | TS422_SFG103 | TS422_Subassembly-103 | 1 | PC | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 24.07.2021 | 31.12.9999 | | |
| 0020 | L | TS422_SFG102 | TS422_Subassembly-102 | 1 | PC | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 24.07.2021 | 31.12.9999 | | |
| 0030 | L | RM129 | RAW129,PD | 2 | PC | <input type="checkbox"/> | <input type="checkbox"/> | 24.07.2021 | 31.12.9999 | | |
| 0040 | | | | | | | | | | | |

Figure 2.26 BOM Item (Component) Overview

| | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|------------------------------------|--|----------------------|--|--|--------------------------------------|---|--|---------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------|--|
| Material | TS422_FG103 | TS422_Finish Goods 103 | | | | | | | | | | | | | | | | |
| Plant | 1710 | Plant 1 US | | | | | | | | | | | | | | | | |
| Alternative BOM | 1 | | | | | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> Basic Data Status/Long Text Administration Document Assignment | | | | | | | | | | | | | | | | | | |
| <p style="text-align: center;">TS422_Subassembly-103</p> <table border="1"> <tr> <td>Item category</td> <td><input checked="" type="checkbox"/> Stock item</td> </tr> <tr> <td>Item ID</td> <td>00000001</td> </tr> <tr> <td>Sort String</td> <td></td> </tr> <tr> <td>Sub-item ID</td> <td><input type="checkbox"/></td> </tr> <tr> <td colspan="2" style="text-align: right;"> <input type="checkbox"/> Seg. maintained <input type="checkbox"/> Seg. Value <input type="text"/> </td> </tr> </table> | | | Item category | <input checked="" type="checkbox"/> Stock item | Item ID | 00000001 | Sort String | | Sub-item ID | <input type="checkbox"/> | <input type="checkbox"/> Seg. maintained <input type="checkbox"/> Seg. Value <input type="text"/> | | | | | | | |
| Item category | <input checked="" type="checkbox"/> Stock item | | | | | | | | | | | | | | | | | |
| Item ID | 00000001 | | | | | | | | | | | | | | | | | |
| Sort String | | | | | | | | | | | | | | | | | | |
| Sub-item ID | <input type="checkbox"/> | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Seg. maintained <input type="checkbox"/> Seg. Value <input type="text"/> | | | | | | | | | | | | | | | | | | |
| <p>Quantity Data</p> <table border="1"> <tr> <td>Quantity</td> <td>1</td> <td>PC</td> <td>Fixed Quantity <input type="checkbox"/></td> </tr> <tr> <td>Operation scrap in %</td> <td><input type="text"/></td> <td>Component Scrap (%) <input type="text"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Net ID</td> <td><input type="checkbox"/></td> <td colspan="2"></td> </tr> </table> | | | Quantity | 1 | PC | Fixed Quantity <input type="checkbox"/> | Operation scrap in % | <input type="text"/> | Component Scrap (%) <input type="text"/> | <input type="checkbox"/> | Net ID | <input type="checkbox"/> | | | | | | |
| Quantity | 1 | PC | Fixed Quantity <input type="checkbox"/> | | | | | | | | | | | | | | | |
| Operation scrap in % | <input type="text"/> | Component Scrap (%) <input type="text"/> | <input type="checkbox"/> | | | | | | | | | | | | | | | |
| Net ID | <input type="checkbox"/> | | | | | | | | | | | | | | | | | |
| <p>General Data</p> <table border="1"> <tr> <td>Co-product <input type="checkbox"/></td> <td>Recurs. allowed <input type="checkbox"/></td> </tr> <tr> <td>AltItemGroup <input type="checkbox"/></td> <td>Recursive <input type="checkbox"/></td> </tr> <tr> <td colspan="2">Discontin. data <input type="checkbox"/></td> </tr> <tr> <td>CAD Indicator <input type="checkbox"/></td> <td>ALE indicator <input type="checkbox"/></td> </tr> <tr> <td>Reference point <input type="text"/></td> <td></td> </tr> </table> | | Co-product <input type="checkbox"/> | Recurs. allowed <input type="checkbox"/> | AltItemGroup <input type="checkbox"/> | Recursive <input type="checkbox"/> | Discontin. data <input type="checkbox"/> | | CAD Indicator <input type="checkbox"/> | ALE indicator <input type="checkbox"/> | Reference point <input type="text"/> | | <p>MRP Data</p> <table border="1"> <tr> <td>Lead-time offset <input type="text"/></td> </tr> <tr> <td>Oper. LT offset <input type="text"/></td> </tr> <tr> <td>Distribution key <input type="text"/></td> </tr> <tr> <td>Phantom item <input type="checkbox"/></td> </tr> <tr> <td>Explosion type <input type="text"/></td> </tr> <tr> <td>Special Procurement <input type="checkbox"/></td> </tr> </table> | Lead-time offset <input type="text"/> | Oper. LT offset <input type="text"/> | Distribution key <input type="text"/> | Phantom item <input type="checkbox"/> | Explosion type <input type="text"/> | Special Procurement <input type="checkbox"/> |
| Co-product <input type="checkbox"/> | Recurs. allowed <input type="checkbox"/> | | | | | | | | | | | | | | | | | |
| AltItemGroup <input type="checkbox"/> | Recursive <input type="checkbox"/> | | | | | | | | | | | | | | | | | |
| Discontin. data <input type="checkbox"/> | | | | | | | | | | | | | | | | | | |
| CAD Indicator <input type="checkbox"/> | ALE indicator <input type="checkbox"/> | | | | | | | | | | | | | | | | | |
| Reference point <input type="text"/> | | | | | | | | | | | | | | | | | | |
| Lead-time offset <input type="text"/> | | | | | | | | | | | | | | | | | | |
| Oper. LT offset <input type="text"/> | | | | | | | | | | | | | | | | | | |
| Distribution key <input type="text"/> | | | | | | | | | | | | | | | | | | |
| Phantom item <input type="checkbox"/> | | | | | | | | | | | | | | | | | | |
| Explosion type <input type="text"/> | | | | | | | | | | | | | | | | | | |
| Special Procurement <input type="checkbox"/> | | | | | | | | | | | | | | | | | | |

Figure 2.27 BOM Item Details

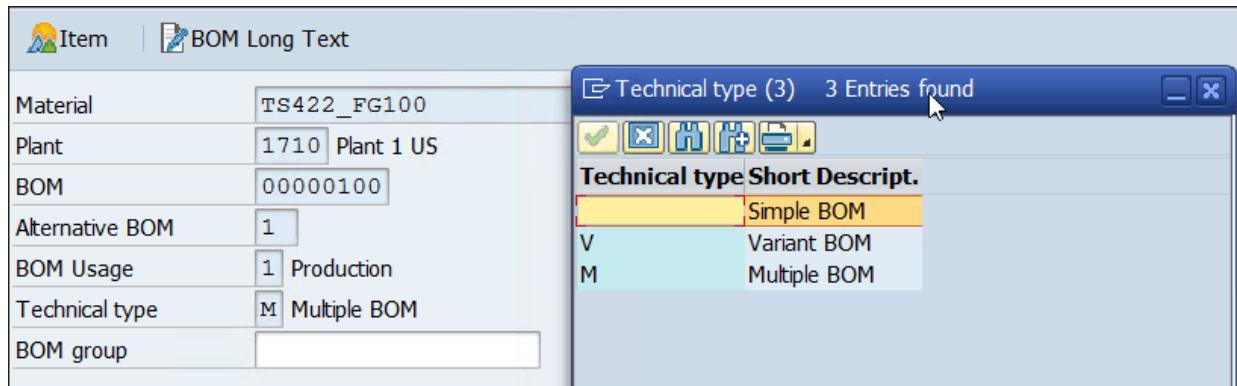


Figure 2.28 BOM Technical Types

| Display material BOM: Header Overview | |
|--|---|
| | Item |
| | Summ.BOM |
| | Alternative Long Text |
| | BOM Long Te |
| Material | TS422_FG101 |
| Plant | 1710 Plant 1 US |
| BOM | 00000101 |
| BOM Usage | 1 Production |
| Technical type | V <input checked="" type="checkbox"/> Variant BOM |
| BOM group | |

Figure 2.29 Variant BOM

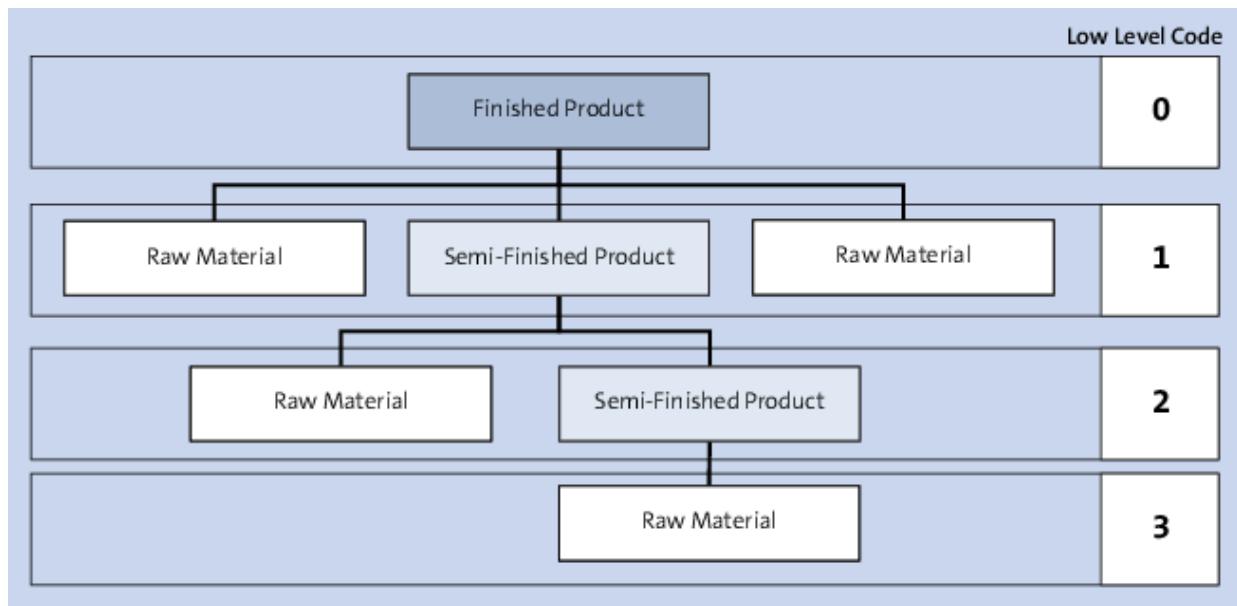


Figure 2.30 BOM Low-Level Code

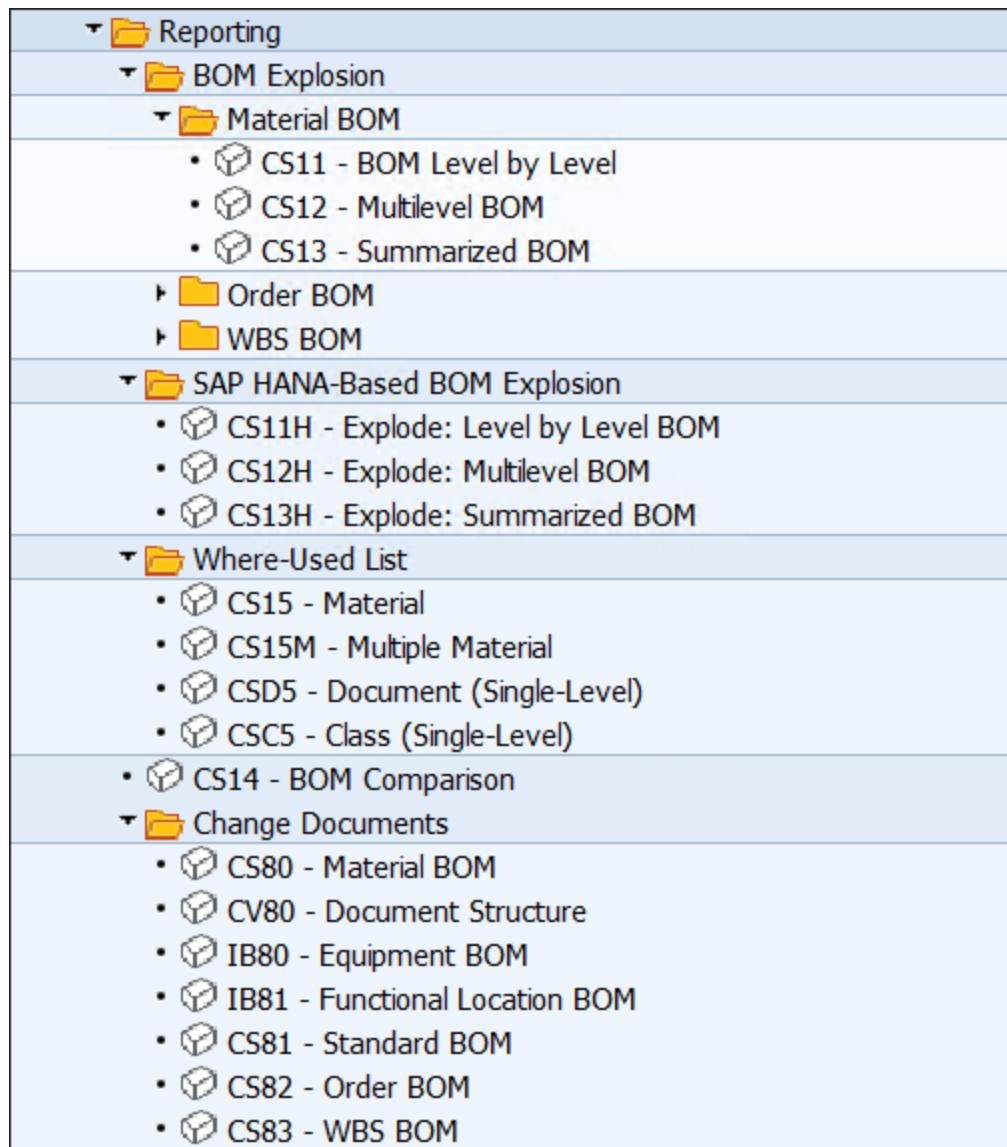


Figure 2.31 BOM Reporting Functions

< SAP Create Work Center: Initial Screen

Basic Data More ▾

* Plant:

* Work center:

Basic data

Work Center Category:

Copy from:

Plant:

Work Center:

Figure 2.32 Work Center: Create

HR assignment Template

Plant 1710 Plant 1 US
Work center TS422_01 TS422 - Production Line 01

Basic Data Default Values Capacities Scheduling Costing Groups

General Data

| | | |
|----------------------|--------------------------|--|
| Work Center Category | 0007 | Production line |
| Person Responsible | 001 | Work center supervisor |
| Location | | |
| QDR System | | |
| Supply Area | | |
| Usage | 009 | All task list types |
| Backflush | <input type="checkbox"/> | Advanced Planning <input type="checkbox"/> |

Standard Value Maintenance

Standard Value Key SAP1 Normal production

Standard Values Overview

| Key Word | Rule for Maint. | Key for Performance Efficiency Rate | Description |
|----------|-----------------|-------------------------------------|-------------|
| Setup | no checking | | |
| Machine | no checking | | |
| Labor | no checking | | |
| | | | |
| | | | |
| | | | |
| | | | |

Description Admin. data Classification Subsystems

The screenshot shows the SAP Work Center configuration interface. At the top, there are navigation icons and tabs for 'HR assignment' and 'Template'. Below that, 'Plant' and 'Work center' fields are displayed with their respective values: 1710 and TS422_01. The 'Work center' field has a yellow background and a red-bordered edit icon. A tab bar below the fields includes 'Basic Data', 'Default Values', 'Capacities', 'Scheduling', 'Costing', and 'Groups', with 'Basic Data' being the active tab. The main area is divided into two sections: 'General Data' and 'Standard Value Maintenance'. The 'General Data' section contains fields for Work Center Category (0007), Person Responsible (001), Location, QDR System, Supply Area, Usage (009), and Backflush (checkbox). The 'Standard Value Maintenance' section shows a table for 'Standard Values Overview' with columns for Key Word (Setup, Machine, Labor), Rule for Maint. (no checking), Key for Performance Efficiency Rate, and Description. A standard SAP toolbar with icons for delete, description, admin. data, classification, and subsystems is at the bottom.

Figure 2.33 Work Center: Basic Data

HR assignment Template

Plant 1710 Plant 1 US
Work center TS422_01 TS422 - Production Line 01

Basic Data Default Values Capacities Scheduling Costing Groups

Operation Default Values

| | | | |
|---------------------|----------------------|-----------|--------------------------|
| Control key | <input type="text"/> | Ref. Ind. | <input type="checkbox"/> |
| Standard Text Key | <input type="text"/> | Ref. Ind. | <input type="checkbox"/> |
| Suitability | <input type="text"/> | Ref. Ind. | <input type="checkbox"/> |
| Setup Type Key | <input type="text"/> | Ref. Ind. | <input type="checkbox"/> |
| Wage type | <input type="text"/> | Ref. Ind. | <input type="checkbox"/> |
| Wage Group | <input type="text"/> | Ref. Ind. | <input type="checkbox"/> |
| No. of Time Tickets | <input type="text"/> | Ref. Ind. | <input type="checkbox"/> |
| No. of Conf. Slips | <input type="text"/> | Ref. Ind. | <input type="checkbox"/> |

Printer

Units of Measurement of Standard Values

| Parameter | St... | Unit Name | |
|-----------|-------|-----------|--|
| Setup | MIN | Minute | |
| Machine | MIN | Minute | |
| Labor | MIN | Minute | |

Figure 2.34 Work Center: Default Values

Intervals and Shifts Intervals Available Capacity Profile Reference Available Capacity Short Texts

| | | |
|-------------------|----------|----------------------------|
| Plant | 1710 | Plant 1 US |
| Work center | TS422_01 | TS422 - Production Line 01 |
| Capacity category | 001 | Vorschlagkapazität |

General data

| | | |
|----------------------|--------------------------|-----------------|
| Capacity Responsible | A | Planner Group A |
| Pooled capacity | <input type="checkbox"/> | Grouping |

Available capacity

| | | |
|--------------------|-----|--------|
| Factory Calendar | US | USA |
| Active Version | | |
| Capacity Base Unit | MIN | Minute |

Standard available capacity

| | | | |
|------------------|----------|----------------------|--------|
| Start Time | 07:00:00 | Capacity Utilization | 100 |
| End Time | 16:00:00 | No. Ind. Capacities | 1 |
| Length of breaks | 01:00:00 | Capacity | 480,00 |
| Operating time | 8,00 | | MIN |

Planning details

| | | |
|-----------------------------------|--|-------------------------------------|
| Relevant to Finite Scheduling | <input checked="" type="checkbox"/> Overload | <input type="checkbox"/> % |
| Can be used by several operations | <input checked="" type="checkbox"/> Long-term planning | <input checked="" type="checkbox"/> |

Figure 2.35 Work Center: Capacities

HR assignment Template

Plant 1710 Plant 1 US

Work center TS422_01 TS422 - Production Line 01

Basic Data Default Values Capacities Scheduling Costing Groups

Scheduling basis

Capacity category 001 Machine

Capacity Vorschlagkapazität

Execution time

Duration of Setup SAP001 Prod.: Setup time

Processing Duration SAP002 Prod.: Machine time

Duration of Teardown

Int. Proc. Duration

Interoperation times

Location Group

Standard Queue Time Minimum Queue Time

Dimension and unit of measure of work

Work dimension

Work unit

Capacity Form. Formula Formula constnts

Figure 2.36 Work Center: Scheduling

HR assignment Template

| | | |
|-------------|----------|----------------------------|
| Plant | 1710 | Plant 1 US |
| Work center | TS422_01 | TS422 - Production Line 01 |

Basic Data Default Values Capacities Scheduling Costing Groups

Validity

| | | | |
|------------|------------|----------|------------|
| Start date | 01.01.2012 | End Date | 31.12.2022 |
|------------|------------|----------|------------|

Link to cost center/activity types

| | | |
|------------------|----------|-----------------------|
| Controlling Area | A000 | Controlling Area A000 |
| Cost Center | 17101301 | Manufacturing 1 (US) |

Activities Overview

| Alt. Activity Text | Activity Type | Activity Unit | R... | Formul... | Formula description |
|--------------------|---------------|---------------|-------------------------------------|-----------|----------------------|
| Setup | 3 | MIN | <input checked="" type="checkbox"/> | SAP005 | Prod: Setup rqmts |
| Machine | 1 | MIN | <input checked="" type="checkbox"/> | SAP006 | Prod.: Machine rqmts |
| Labor | 11 | MIN | <input checked="" type="checkbox"/> | SAP007 | Prod.: Labor rqmts |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |
| | | | | | |

ActType Int.Proc.

Link to business process

| | | | |
|----------------------|--------------------------|-------------------|--------------------------|
| Business Process | | | |
| Incentive wages ind. | <input type="checkbox"/> | Record Type Group | <input type="checkbox"/> |

Form. Formula Formula constnts Validities

Figure 2.37 Work Center: Costing Information

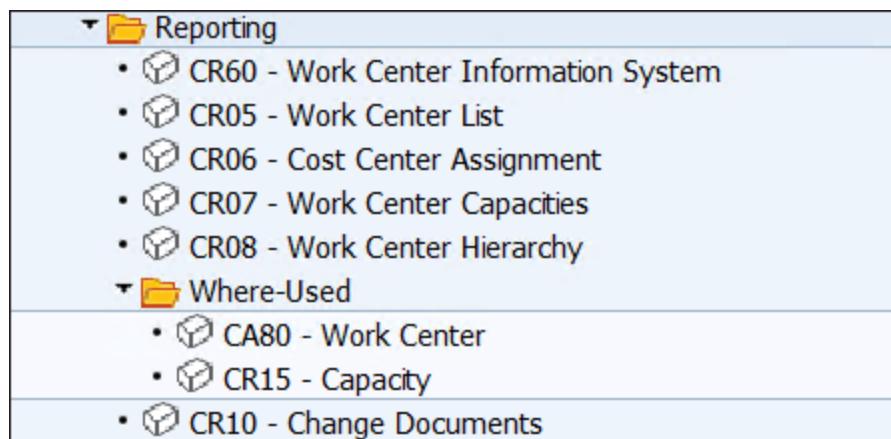


Figure 2.38 Work Center: Reporting

< SAP Create Routing: Initial Screen

Header Copy from Routings Sequences Operations More ▾

Material: TS422_FG100
Plant: 1710
Sales document: Sales Document Item:
WBS Element:
Group:

Validity

Change Number:
* Key Date: 04.08.2021
Revision Level:

Additional data

Profile:

Figure 2.39 Create Routing: Initial Screen

Previous header Next header New entry Long text Routings Assignment Sequences Operations Allocation More ▾

| | |
|--|--|
| Group: <input type="text" value="41710000"/> | Group Counter: <input type="text" value="1"/> MTS - Packaging Line 1 |
| Material: <input type="text" value="TS422_FG100"/> | TS422-FG100 - Finished Material |

Task List

| | |
|---|---|
| Group: <input type="text" value="41710000"/> | MTS - Packaging Line 1 |
| Group Counter: <input type="text" value="1"/> | <input type="checkbox"/> Long Text Exists: <input type="checkbox"/> |
| * Plant: <input type="text" value="1710"/> | |

Production line

Line Hierarchy

General Data

| | |
|---|--|
| Deletion Flag: <input type="checkbox"/> | |
| * Usage: <input type="text" value="1"/> Production | |
| * Overall Status: <input type="text" value="4"/> Released (general) | |
| Planner Group: <input type="text"/> | |
| Planning Work Center: <input type="text"/> | |
| CAPP order: <input type="text"/> | |
| Lot Size From: <input type="text" value="1"/> | Lot Size To: <input type="text" value="99,999,999"/> <input type="text" value="PC"/> |
| Old Task List No.: <input type="text"/> | |

Parameters for Dynamic Modification/Inspection Points

Figure 2.40 Routing Header Details

| Previous header | | Next header | | Header | | Select all | | Deselect all | | Delete | | Check | | Long text | | Reference | | Work center | | Allocation | | Detail | | Sequences | | More ▾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|-----|---------------------------------|-------|------------------------|-------------|------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------|------|-----------|------|-------------|---------|------------|------------|--------|------|------------|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Group: 41710000 | | Group Counter: 1 | | MTS - Packaging Line 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Material: TS422_FG100 | | TS422-FG100 - Finished Material | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operation Overview | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Op... | SO# | Work ce... | Plant | *C... | Standard... | Description | Lo... | PRT | Cl... | O... | Pe... | C... | Su... | Base Quantity | U... | Setup | Unit | Activit... | Machine | Unit | Activit... | Labor | Unit | Activit... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> 0010 | | ASSEMBLY | 1710 | YBP1 | | Assembly | <input type="checkbox"/> | 100 | PC | 30 | MIN | 3 | 10 | MIN | 1 | 10 | MIN | 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> 0020 | | TESTING | 1710 | YBP1 | | Final Acceptance | <input type="checkbox"/> | 100 | PC | 30 | MIN | 3 | 10 | MIN | 1 | 10 | MIN | 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> 0030 | | PACK01 | 1710 | YBP1 | | Packaging | <input type="checkbox"/> | 100 | PC | 30 | MIN | 3 | 10 | MIN | 1 | 10 | MIN | 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> 0040 | | TESTING | 1710 | YBP1 | | Posting GR | <input type="checkbox"/> | 100 | PC | 30 | MIN | 3 | 10 | MIN | 1 | 10 | MIN | 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 2.41 Routing: Operation Overview

| Previous operation | Next operation | Check | Long text | Work center | Routings | Sequences | Allocation | PRT | More ▾ |
|--|----------------------------------|---------------------------------|---------------------------------------|--|----------|-----------|------------|-----|---------------------------------|
| Group: <input type="text" value="41710000"/> | | | | Group Counter: <input type="text" value="1"/> MTS - Packaging Line 1 | | | | | |
| Material: <input type="text" value="TS422_FG100"/> | | | | | | | | | TS422-FG100 - Finished Material |
| Operation | | | | | | | | | |
| * Activity: <input type="text" value="0010"/> | | | | Suboperation: <input type="text"/> | | | | | |
| * Control key: <input type="text" value="YBP1"/> | | | | No Auto GR , Cost , Sched , Print , Conf | | | | | |
| * Plant: <input type="text" value="1710"/> | | | | | | | | | |
| Work center: <input type="text" value="ASSEMBLY"/> | | | | Assembly | | | | | |
| Standard Text Key: <input type="text"/> | | | | Assembly | | | | | |
| Long Text Exists: <input type="checkbox"/> | | | | | | | | | |
| Standard Values | | | | | | | | | |
| Conversion of Units of Measure | | | | | | | | | |
| * Base Quantity: <input type="text" value="100"/> | Header | Unit | Operat. | Un | | | | | |
| * Operation unit: <input type="text" value="PC"/> | <input type="text" value="1"/> | <input type="text" value="PC"/> | * <=>: <input type="text" value="1"/> | <input type="text" value="PC"/> | | | | | |
| Break Time: <input type="text"/> | | | | | | | | | |
| Std Value | Un | Act. Type | Efficiency | | | | | | |
| Setup: <input type="text" value="30"/> | <input type="text" value="MIN"/> | <input type="text" value="3"/> | <input type="text"/> | | | | | | |
| Machine: <input type="text" value="10"/> | <input type="text" value="MIN"/> | <input type="text" value="1"/> | <input type="text"/> | | | | | | |
| Labor: <input type="text" value="10"/> | <input type="text" value="MIN"/> | <input type="text" value="11"/> | <input type="text"/> | | | | | | |
| Business Process: <input type="text"/> | | | | | | | | | |

Figure 2.42 Routing: Operation Details

| | | | | | | |
|---|------------------------------------|--------------------------|---------------------|------------------------------------|--------------------------|--|
| Transfer to orders | | | | | | |
| Cumulation Type: | <input type="checkbox"/> | | | | | |
| no suboperations: <input type="checkbox"/> | | | | | | |
| Determination of Standard Values | | | | | | |
| SV Determ. Type: | <input type="checkbox"/> | | | | | |
| Calculation date: | <input type="checkbox"/> | | | | | |
| Calculation basis: | <input type="checkbox"/> | | | | | |
| Standard value code: | <input type="checkbox"/> | | | | | |
| CAPP | | | | | | |
| CAPP prod. order: | <input type="checkbox"/> | | | | | |
| CAPP text created: | <input type="checkbox"/> | | | | | |
| Interoperation times | | | | | | |
| Reduction Strategy: | <input type="checkbox"/> | | | | | |
| Teardown/Wait Parallel: | <input type="checkbox"/> | | | | | |
| Maximum Wait Time: | <input type="checkbox"/> | <input type="checkbox"/> | Minimum Wait Time: | <input type="checkbox"/> | <input type="checkbox"/> | |
| Standard Queue Time: | <input type="checkbox"/> | <input type="checkbox"/> | Minimum Queue Time: | <input type="checkbox"/> | <input type="checkbox"/> | |
| Standard Move Time: | <input type="checkbox"/> | <input type="checkbox"/> | Minimum Move Time: | <input type="checkbox"/> | <input type="checkbox"/> | |
| Interoperation times for work center | | | | | | |
| Standard Queue Time: | <input type="text" value="0.000"/> | <input type="checkbox"/> | Minimum Queue Time: | <input type="text" value="0.000"/> | <input type="checkbox"/> | |

Figure 2.43 Routing Operation Details: Interoperation Times

Splitting

Splitting Required:

Max Number of Splits:

Min. Processing Time: (Economical Splitting)

Overlapping

Required Overlapping:

Optional Overlapping:

Flow Manufacturing:

No Overlapping:

Minimum Overlap Time:

Min. Send-Ahead Qty: PC

Figure 2.44 Routing Operation Details: Splitting

General data

| | |
|-----------------------|---------------------------------------|
| Scrap in %: | <input type="text"/> |
| No. of Time Tickets: | <input type="text"/> |
| No. of Conf. Slips: | <input type="text"/> |
| Wage Group: | <input type="text"/> |
| Wage type: | <input type="text"/> |
| Suitability: | <input type="text"/> |
| Number of employees: | <input type="text"/> |
| Setup Type Key: | <input type="text"/> |
| Setup group category: | <input type="text"/> |
| Setup group key: | <input type="text"/> |
| CostingRelevnyc: | <input checked="" type="checkbox"/> X |
| Non-Value-Added: | <input type="checkbox"/> |

Figure 2.45 Routing Operation Details: General Data

External processing

| | | |
|--|--|---|
| Subcontracting: <input type="checkbox"/> | Purchasing Info Rec.: <input type="text"/> | Purchas. Organization: <input type="text"/> |
| Outline Agreement: <input type="text"/> | Item, Outline Agreemnt: <input type="text"/> | |
| Sort Term: <input type="text"/> | | |
| Material Group: <input type="text"/> | | |
| Purchasing Group: <input type="text"/> | | |
| Vendor: <input type="text"/> | | |
| Planned Deliv. Time: <input type="text"/> Days | | |
| Price unit: <input type="text"/> | Cost Element: <input type="text"/> | |
| Net Price: <input type="text"/> | Currency: <input type="text"/> | |
| Inspection Type: <input type="text"/> | | |

Recording View: Single Values and Summarized Results (Default View)

User-Specific Fields

| |
|--|
| Field key: <input type="text"/> <input type="button" value="🔍"/> |
|--|

Figure 2.46 Routing Operation Details: External Processing

New Entries: Details of Added Entries



| | | |
|----------------------|----------------------|----------------------|
| Field key | <input type="text"/> | <input type="text"/> |
| Text | <input type="text"/> | <input type="text"/> |
| Text | <input type="text"/> | <input type="text"/> |
| Quantity | <input type="text"/> | <input type="text"/> |
| Value | <input type="text"/> | <input type="text"/> |
| Date | <input type="text"/> | <input type="text"/> |
| Checkboxes | <input type="text"/> | <input type="text"/> |
| Authorization object | <input type="text"/> | |

Figure 2.47 Routing Operation: User-Defined Fields

Change View "Control Keys for Operations": Details

New Entries

Control key **YBP1** **No Auto GR , Cost , Sched , Print , Conf**

Indicator

| | |
|--|--|
| <input checked="" type="checkbox"/> Scheduling | <input checked="" type="checkbox"/> Print Confirmation |
| <input checked="" type="checkbox"/> Det. Cap. Reqmnts | <input checked="" type="checkbox"/> Print |
| <input type="checkbox"/> Insp. Char. Required | <input checked="" type="checkbox"/> Cost |
| <input type="checkbox"/> Automatic GR | <input type="checkbox"/> Sched. External Op. |
| <input checked="" type="checkbox"/> Print Time Tickets | <input type="checkbox"/> Not Relevant for MES |
| <input type="checkbox"/> Rework | |

External Processing Internally processed operation

Confirmations **2 Confirmation required**

Call Up Long Text

Figure 2.48 Control Key

Change Routing: Operation Overview

Group: 41710000 Material: TS422_FG101 Group Counter: Component Allocation (F7) Planning Material: MTS - Packaging Line 1

| Op... | SOp | Work cen... | Plant | Co... | Standard ... | Description | L... | PRT | Cl... | O... | P... | C... |
|-------|-----|-------------|-------|-------|--------------|--|------|-----|-------|------|------|------|
| 0010 | | ASSEMBLY | 1710 | YBP1 | | Assembly | | | | | | |
| 0020 | | TESTING | 1710 | YBP1 | | Final Acceptance | | | | | | |
| 0030 | | PACK01 | 1710 | YBP1 | | Packaging | | | | | | |
| 0040 | | TESTING | 1710 | YBP1 | | Posting GR (with opt. SerialNo assignm.) | | | | | | |
| 0050 | | | 1710 | | | | | | | | | |

Routing Change: Material Component Overview

Material: TS422_FG101 Planning Material: MTS - Packaging Line 1

| P.. | L.. | Path | It... | Component | Quantity | Sort String | U... | I... | B... | Activity | Seq. |
|-----|-----|------|--------------|-----------|----------|-------------|------|------|------|----------|------|
| 0 | 0 | 0010 | TS422_SFG101 | 1 | | | PC | L | | 0010 | 0 |
| 0 | 0 | 0020 | TS422_SFG102 | 1 | | | PC | L | | 0020 | 0 |
| 0 | 0 | 0030 | TS422_SFG103 | 1 | | | PC | L | | 0020 | 0 |
| 0 | 0 | 0040 | RM129 | 5 | | | PC | L | | 0010 | 0 |
| 0 | 0 | 0050 | R-311 | 5 | | | PC | L | | 0040 | 0 |

Figure 2.49 Operation: Component Allocation

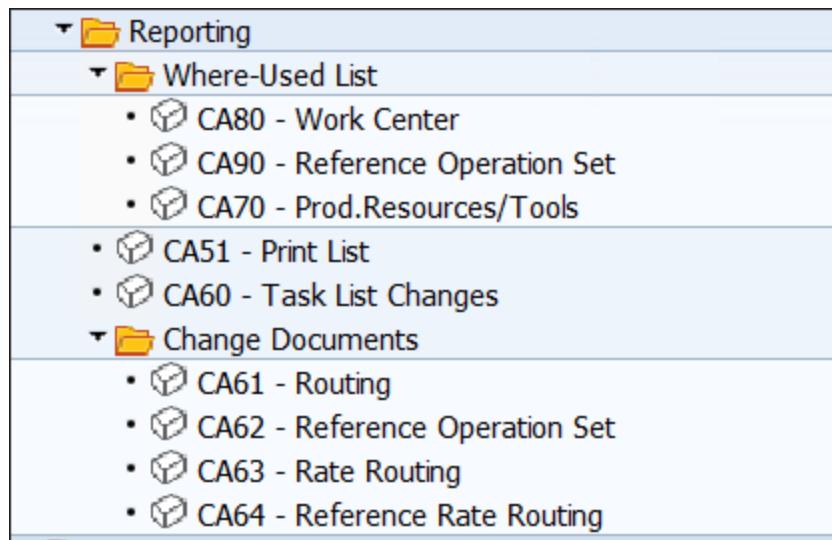


Figure 2.50 Routing Reporting Functions

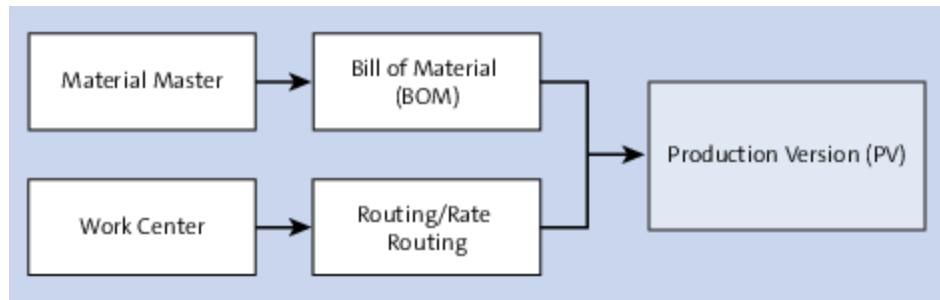


Figure 2.51 Production Version

Production Version Details

| | | | |
|---|--|--|---|
| Production Version | 0001 | Prod. version 1 | Check |
| 20.01.2021 | | | |
| Basic data | | | |
| Prod. Vers. locked | <input type="button" value="Not locked"/> | | |
| Minimum Lot Size | 1.000 | Maximum Lot Size | 99,999,999.000 |
| Valid from | 20.01.2021 | Valid To | 31.12.9999 |
| Planning data | | | |
| Detailed planning | Task List Type <input type="button" value="N Routing"/> | Group <input type="button" value="41710000"/> | Group Counter <input type="button" value="2"/> |
| Check stat  | | | |
| Bill of material | | | |
| Alternative BOM | <input type="button" value="1"/> | BOM Usage | <input type="button" value="1"/> |
| Apportionment Struct | <input type="button"/> | | |
| Repetitive Manufacturing | | | |
| <input type="checkbox"/> REM Allowed | Production Line | <input type="button"/> | Planning ID <input type="button"/> |
| Other data | | | |
| Other Header Mat. | <input type="button"/> | | |
| Distribution Key | <input type="button"/> | Issue stor. Location | <input type="button"/> |
| Warehouse Number | <input type="button"/> | Receiving Location | <input type="button"/> |
| OB Reference Mat. | <input type="button"/> | | |
| Default Supply Area | <input type="button"/> | | |
| <input type="button" value="Continue"/> <input type="button" value="Previous Version"/> <input type="button" value="Next Version"/> <input type="button" value="Cancel"/> | | | |

Figure 2.52 Production Version Maintenance

| Production Version: Mass Processing | | | | | | | | | | | | | | | | | | | | |
|--|--------------|--------|----------------------|--------|----|-----|-----|-------|------------|------------|------------|---------------|------------------|------|--------|------|----------|----------|----------|------|
| Selection Conditions | | | | | | | | | | | | | | | | | | | | |
| Selection Conditions Plant: <input type="text" value="1710"/> Plant 1 US Material: <input type="text"/> MRP Controller: <input type="text"/> Task List Type: <input type="button" value="▼"/> Key date: <input type="text" value="10.08.2021"/> Group: <input type="text"/> Production Line: <input type="text"/> | | | | | | | | | | | | | | | | | | | | |
| Consistency Check Assign Change Number Document Edit Master Recipe Copy Recipe 60 / 66 | | | | | | | | | | | | | | | | | | | | |
| Production Versions | | | | | | | | | | | | | | | | | | | | |
| Plant | Material | Pro... | Production Version T | Lock | M. | P.. | C.. | Te... | Check date | Valid from | Valid To | From Lot Size | To Lot Size | Unit | Ate... | B... | Ap... | Group | Gro... | Type |
| 1710 | TS422_FG100 | 0001 | Prod. version 1 | No.. ▾ | | | | | 20.01.2021 | 20.01.2021 | 31.12.9999 | 1.000 | 99,999,999.000PC | 1 | 1 | | 41710000 | 0 | N Ro.. ▾ | |
| 1710 | TS422_FG101 | 0001 | Prod. version 1 | No.. ▾ | | | | | 20.01.2021 | 20.01.2021 | 31.12.9999 | 1.000 | 99,999,999.000PC | 1 | 1 | | 41710000 | 2 | N Ro.. ▾ | |
| 1710 | TS422_SFG100 | 0001 | Prod. version 1 | No.. ▾ | | | | | 20.01.2021 | 20.01.2021 | 31.12.9999 | 1.000 | 99,999,999.000PC | 1 | 1 | | 50000026 | 1 | N Ro.. ▾ | |
| 1710 | TS422_SFG101 | 0001 | Prod. version 1 | No.. ▾ | | | | | 20.01.2021 | 20.01.2021 | 31.12.9999 | 1.000 | 99,999,999.000PC | 1 | 1 | | 50000027 | 1 | N Ro.. ▾ | |
| 1710 | TS422_SFG102 | 0001 | Prod. version 1 | No.. ▾ | | | | | 20.01.2021 | 20.01.2021 | 31.12.9999 | 1.000 | 99,999,999.000PC | 1 | 1 | | 50000028 | 1 | N Ro.. ▾ | |
| 1710 | TS422_SFG103 | 0001 | Prod. version 1 | No.. ▾ | | | | | 18.03.2021 | 18.03.2021 | 31.12.9999 | 1.000 | 99,999,999.000PC | 1 | 1 | | 50000029 | 1 | N Ro.. ▾ | |
| 1710 | TS422_SFG103 | 0002 | Prod. version 2 | No.. ▾ | | | | | 18.03.2021 | 18.03.2021 | 31.12.9999 | 200.000 | 500.000PC | 1 | 1 | 4 | 1 | R Ra.. ▾ | | |

Figure 2.53 Production Version: Mass Maintenance

The screenshot shows the SAP Engineering Change Management (ECM) interface. At the top, there is a navigation bar with icons for Object Types, Objects, Alternative Dates, and various document and search functions. Below the navigation bar, the 'Change number' field contains 'TS422_ECM_01'. A red box highlights this field. To the right of the field, the text 'TS422_ECM_01' is displayed in a larger font. Below the change number, the text 'Change Master Without Release Key' is visible.

Description

| | |
|---------------------|--------------------------|
| Valid From | 10.08.2021 |
| Authorization group | [empty] |
| Reason for Change | Change in the components |

Status Information

| | |
|--|----------|
| Change no. status | 1 Active |
| <input type="checkbox"/> Usage | |
| <input type="checkbox"/> Deletion Flag | |

Figure 2.54 Engineering Change Management: Change Master

MRP 2 MRP 3 MRP 4 Advanced Planning Forecasting Work scheduling Plant data / stor. 1

Material: TS422_FG100
* Descr.: Finished Product FG100
Plant: 1010 Plant 1 SE

Forecast Requirements

Period Indicator W Fiscal Year Variant: Splitting indicator:

Planning

Strategy Group: 40 Planning with final assembly
Consumption mode: 2 Bwd consumption per.: 30
Fwd consumption per.: 30 Mixed MRP:
Planning material: Planning plant:
Plng conv. factor: Planning matl BUnit:

Figure 3.1 MRP 3 View: Consumption Mode and Consumption Periods

| | | | |
|---|--|--|--------------------------|
| Strategy: | 40 Planning with final assembly | | |
| Requirements type of independent requirements | | | |
| Reqmts type for indep.reqmts: | VSF Planning with Final Assembly | | |
| Reqmts class: | 101 Plnng with assembly | | |
| Consumption: | 1 Consume planning with assembly | | |
| Planning Ind.: | 1 Net requirements planning | | |
| Requirements type of customer requirements | | | |
| Reqmt type of customer reqmt: | KSV Sales Ord w. consumpt/Delivery | | |
| Requirements class: | 050 SlsOrd w consu./Delv | | |
| Allocation indicat.: | 1 Consume planning with assembly | | |
| No MRP: | <input type="checkbox"/> Requirement planned | <input checked="" type="checkbox"/> Availability check | |
| Acct Assgmt Cat: | <input type="checkbox"/> | <input checked="" type="checkbox"/> Requirement transfer | |
| Settlement profile: | <input type="checkbox"/> | <input type="checkbox"/> Req. Reduct. | |
| Results analysis key: | <input type="checkbox"/> | | |
| Assembly order | | | |
| Assembly type: | 0 No assembly order processing | Online assembly: | <input type="checkbox"/> |
| Order Type: | <input type="checkbox"/> | Capacity Check: | <input type="checkbox"/> |

Figure 3.2 Planning Strategy Customization

Strategy Group: **41** Plng with final assem, with make-to-ord.

Planning Strategies

* Main Strategy: **40** Planning with final assembly

Strategy: **20** Make-to-order production

Strategy:

Strategy:

Strategy:

Strategy:

Strategy:

Strategy:

Strategy:

Figure 3.3 Planning Strategy Group

| Material: | TS422_FG101 | <input type="button" value="Search"/> | | | | | | | | | |
|----------------------------------|-----------------------------------|---------------------------------------|------------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|---------------------------------------|--------------------------------------|------|-------|
| Description: | TS422-FG101- Finished Material | | | | | | | | | | |
| MRP Area: | 1710 | Plant 1 US | | | | | | | | | |
| Plant: | 1710 | Ex. manuf.: | | | | | | | | | |
| MRP type: | PD | Material type: FERT | | | | | | | | | |
| Unit: | PC | <input type="button" value="Print"/> | | | | | | | | | |
| <input type="button" value="Σ"/> | <input type="button" value="63"/> | <input type="button" value="Edit"/> | <input type="button" value="New"/> | <input type="button" value="Print"/> | <input type="button" value="GR"/> | <input type="button" value="ST On"/> | <input type="button" value="On"/> | <input type="button" value="Vendor"/> | <input type="button" value="Cust."/> | Page | 1 / 1 |
| A... | Date | MRP e... | MRP element data | Rescheduling... | E... | Receipt/Reqmt | Available Qty | Pro... | Stor... | | |
| <input type="button" value="Q"/> | 21.01.2021 | Stock | | | | | | 0 | | | |
| <input type="button" value="Q"/> | 01.01.2021 | IndReq | LSF | | | | 100- | 100- | | | |
| <input type="button" value="Q"/> | 22.01.2021 | PldOrd | 0000000552/STCK | 01.01.2021 | <u>30</u> | | 100 | 0 | <u>0001</u> | 171A | |
| <input type="button" value="Q"/> | 01.02.2021 | PldOrd | 0000000553/STCK | | | | 100 | 100 | <u>0001</u> | 171A | |
| <input type="button" value="Q"/> | 01.02.2021 | IndReq | LSF | | | | 100- | 0 | | | |
| <input type="button" value="Q"/> | 01.03.2021 | PldOrd | 0000000554/STCK | | | | 100 | 100 | <u>0001</u> | 171A | |
| <input type="button" value="Q"/> | 01.03.2021 | IndReq | LSF | | | | 100- | 0 | | | |
| <input type="button" value="Q"/> | 01.04.2021 | PldOrd | 0000000555/STCK | | | | 100 | 100 | <u>0001</u> | 171A | |
| <input type="button" value="Q"/> | 01.04.2021 | IndReq | LSF | | | | 100- | 0 | | | |

Figure 3.4 Stock/Requirements List: Net Requirements Planning

| Material: | TS422_FG100 | | | | | | | | | | | | |
|--------------|---------------------------------|---------------------|-------------------------|-----------------|------|---------------|---------------|--------|---------|--|--|--|------------|
| Description: | TS422-FG100 - Finished Material | | | | | | | | | | | | |
| MRP Area: | 1710 | Plant 1 US | | | | | | | | | | | |
| Plant: | 1710 | Ex. manuf.: | | | | | | | | | | | |
| MRP type: | PD | Material type: FERT | | | | | | | | | | | |
| Unit: | PC | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | Page 1 / 1 |
| A... | Date | MRP e... | MRP element data | Rescheduling... | E... | Receipt/Reqmt | Available Qty | Pro... | Stor... | | | | |
| | 21.01.2021 | Stock | | | | | 0 | | | | | | |
| | 20.01.2021 | CusOrd | 0000000133/000010/0001 | | | 75- | | 75- | | | | | |
| | 21.01.2021 | -----> | Gross Requirements Plan | | | | | | | | | | |
| | 01.01.2021 | IndReq | BSF | | | 100- | | 100- | | | | | |
| | 22.01.2021 | PldOrd | 0000000556/STCK | 01.01.2021 | 30 | 100 | 0 | 0001 | 171A | | | | |
| | 01.02.2021 | PldOrd | 0000000557/STCK | | | 100 | 100 | 0001 | 171A | | | | |
| | 01.02.2021 | IndReq | BSF | | | 100- | 0 | | | | | | |
| | 01.03.2021 | PldOrd | 0000000558/STCK | | | 100 | 100 | 0001 | 171A | | | | |
| | 01.03.2021 | IndReq | BSF | | | 100- | 0 | | | | | | |
| | 01.04.2021 | PldOrd | 0000000559/STCK | | | 100 | 100 | 0001 | 171A | | | | |
| | 01.04.2021 | IndReq | BSF | | | 100- | 0 | | | | | | |

Figure 3.5 Stock/Requirements List: Gross Requirements Planning

| Stock/Requirements List as of 23:53 hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------------|---|------------------------|-----------------|------|---------------|------------------|-----------------|------|---------------|---------------|--|---|------------|-------|--|--|--|--|---|--|---|------------|--------|-----|--|--|-----|-----|--|---|------------|--------|------------------------|--|--|-----|------|--|---|------------|--------|-----|--|--|------|------|--|---|------------|--------|-----|--|--|------|------|--|---|------------|--------|-----|--|--|------|------|--|
| Show Overview Tree Refresh Filter On Send Mail to MRP Controller More ▾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  Material: <input type="text" value="TS422_FG100"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Description: <input type="text" value="TS422-FG100 - Finished Material"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MRP Area: <input type="text" value="1710"/> | | Plant 1 US | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ex. manuf.: <input type="text"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plant: <input type="text" value="1710"/> | | MRP type: <input type="text" value="PD"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Material type: <input type="text" value="FERT"/> | | Unit: <input type="text" value="PC"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="button" value="Print"/> | | <input type="button" value="Save"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|          Date  GR  ST On  On  Vendor  Cust.  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Page <input type="text" value="1"/> / <input type="text" value="1"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>A...</th> <th>Date</th> <th>MRP e...</th> <th>MRP element data</th> <th>Rescheduling...</th> <th>E...</th> <th>Receipt/Reqmt</th> <th>Available Qty</th> <th></th> </tr> </thead> <tbody> <tr> <td></td><td>20.01.2021</td><td>Stock</td><td></td><td></td><td></td><td></td><td>0</td><td></td></tr> <tr> <td></td><td>01.01.2021</td><td>IndReq</td><td>VSF</td><td></td><td></td><td>25-</td><td>25-</td><td></td></tr> <tr> <td></td><td>20.01.2021</td><td>CusOrd</td><td>0000000133/000010/0001</td><td></td><td></td><td>75-</td><td>100-</td><td></td></tr> <tr> <td></td><td>01.02.2021</td><td>IndReq</td><td>VSF</td><td></td><td></td><td>100-</td><td>200-</td><td></td></tr> <tr> <td></td><td>01.03.2021</td><td>IndReq</td><td>VSF</td><td></td><td></td><td>100-</td><td>300-</td><td></td></tr> <tr> <td></td><td>01.04.2021</td><td>IndReq</td><td>VSF</td><td></td><td></td><td>100-</td><td>400-</td><td></td></tr> </tbody> </table> | | | | A... | Date | MRP e... | MRP element data | Rescheduling... | E... | Receipt/Reqmt | Available Qty | |  | 20.01.2021 | Stock | | | | | 0 | |  | 01.01.2021 | IndReq | VSF | | | 25- | 25- | |  | 20.01.2021 | CusOrd | 0000000133/000010/0001 | | | 75- | 100- | |  | 01.02.2021 | IndReq | VSF | | | 100- | 200- | |  | 01.03.2021 | IndReq | VSF | | | 100- | 300- | |  | 01.04.2021 | IndReq | VSF | | | 100- | 400- | |
| A... | Date | MRP e... | MRP element data | Rescheduling... | E... | Receipt/Reqmt | Available Qty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 20.01.2021 | Stock | | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 01.01.2021 | IndReq | VSF | | | 25- | 25- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 20.01.2021 | CusOrd | 0000000133/000010/0001 | | | 75- | 100- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 01.02.2021 | IndReq | VSF | | | 100- | 200- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 01.03.2021 | IndReq | VSF | | | 100- | 300- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 01.04.2021 | IndReq | VSF | | | 100- | 400- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 3.6 Stock Requirements List: Planning with Final Assembly

| Material: | TS422_FG100 | Description: | TS422-FG100 - Finished Material | | | | |
|------------|-------------|------------------------|---------------------------------|---------------------|---------------|--------|---------|
| MRP Area: | 1710 | Plant 1 US | Ex. manuf.: | | | | |
| Plant: | 1710 | MRP type: | PD | Material type: FERT | | | |
| | | | Unit: PC | | | | |
| | | | | Print | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | Page 1 / 1 | | | |
| A... Date | MRP e... | MRP element data | Rescheduling... | E... Receipt/Reqmt | Available Qty | Pro... | Stor... |
| 21.01.2021 | Stock | | | | 0 | | |
| 21.01.2021 | CustSt | 0000000142/000010 | | | 0 | | |
| 21.01.2021 | CusOrd | 0000000142/000010/0001 | | 85- | 85- | | |
| 22.01.2021 | PldOrd | 0000000565/SO | | 85 | 0 | 0001 | 171A |
| 21.01.2021 | CustSt | 0000000143/000010 | | | 0 | | |
| 21.01.2021 | CusOrd | 0000000143/000010/0001 | | 75- | 75- | | |
| 22.01.2021 | PldOrd | 0000000566/SO | | 75 | 0 | 0001 | 171A |
| 21.01.2021 | CustSt | 0000000144/000010 | | | 0 | | |
| 21.01.2021 | CusOrd | 0000000144/000010/0001 | | 150- | 150- | | |
| 22.01.2021 | PldOrd | 0000000567/SO | | 150 | 0 | 0001 | 171A |

Figure 3.7 Stock Requirements List: MTO Production

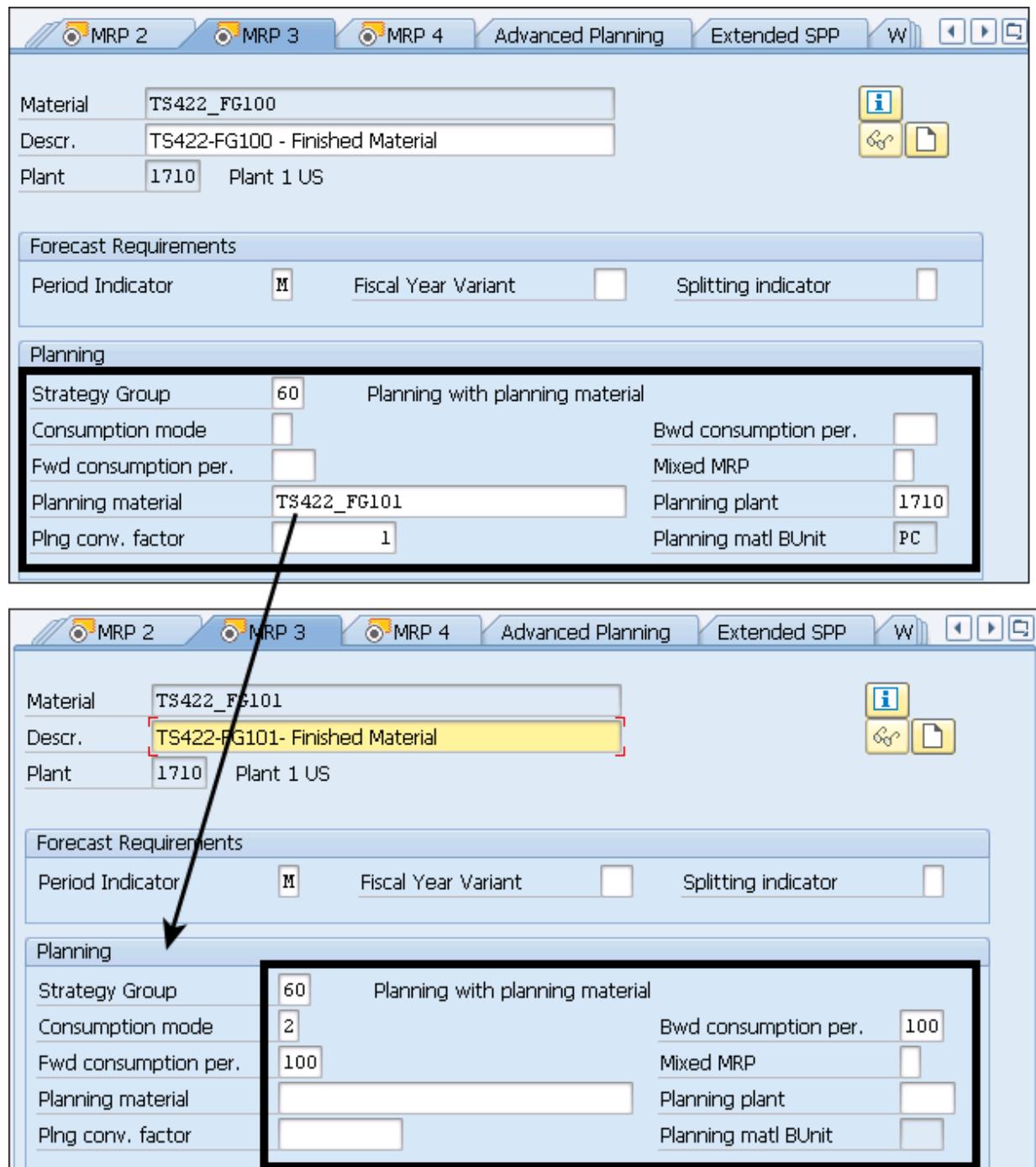


Figure 3.8 Material Mater Settings for Both the Finished Material and the Planning Material

Material: TS422_FG100

Description: Variant - Finished Material

MRP Area: 1710 Plant 1 US Ex. manuf.:

Plant: 1710 MRP type: PD Material type: FERT Unit: PC

| A... Date | MRP e... | MRP element data | Rescheduling... | E... | Receipt/Reqmt | Available Qty | Pro... | Stor... |
|------------|----------|------------------------|-----------------|------|---------------|---------------|--------|---------|
| 21.01.2021 | Stock | | | | | 0 | | |
| 21.01.2021 | CustSt | 0000000141/000010 | | | | 0 | | |
| 20.01.2021 | CusOrd | 0000000141/000010/0001 | | | 85- | 85- | | |
| 22.01.2021 | PldOrd | 0000000560/SO | | | 85 | 0 | 0001 | 171A |

Material: TS422_FG101

Description: Planning Material

MRP Area: 1710 Plant 1 US Ex. manuf.:

Plant: 1710 MRP type: PD Material type: FERT Unit: PC

| A... Date | MRP e... | MRP element data | Rescheduling... | E... | Receipt/Reqmt | Available Qty | Pro... | Stor... |
|------------|----------|------------------------|-----------------|------|---------------|---------------|--------|---------|
| 21.01.2021 | Stock | | | | | 0 | | |
| 21.01.2021 | -----> | Preplanning w/o Assemb | | | | | | |
| 01.01.2021 | PldOrd | 0000000561/INDR | | 52 | 15 | 15 | 0001 | 171A |
| 01.01.2021 | IndReq | VSEV | | | 15- | 0 | | |
| 01.02.2021 | PldOrd | 0000000562/INDR | | | 100 | 100 | 0001 | 171A |
| 01.02.2021 | IndReq | VSEV | | | 100- | 0 | | |
| 01.03.2021 | PldOrd | 0000000563/INDR | | | 100 | 100 | 0001 | 171A |
| 01.03.2021 | IndReq | VSEV | | | 100- | 0 | | |
| 01.04.2021 | PldOrd | 0000000564/INDR | | | 100 | 100 | 0001 | 171A |
| 01.04.2021 | IndReq | VSEV | | | 100- | 0 | | |

Figure 3.9 Stock Requirements List: Planning with Planning Material

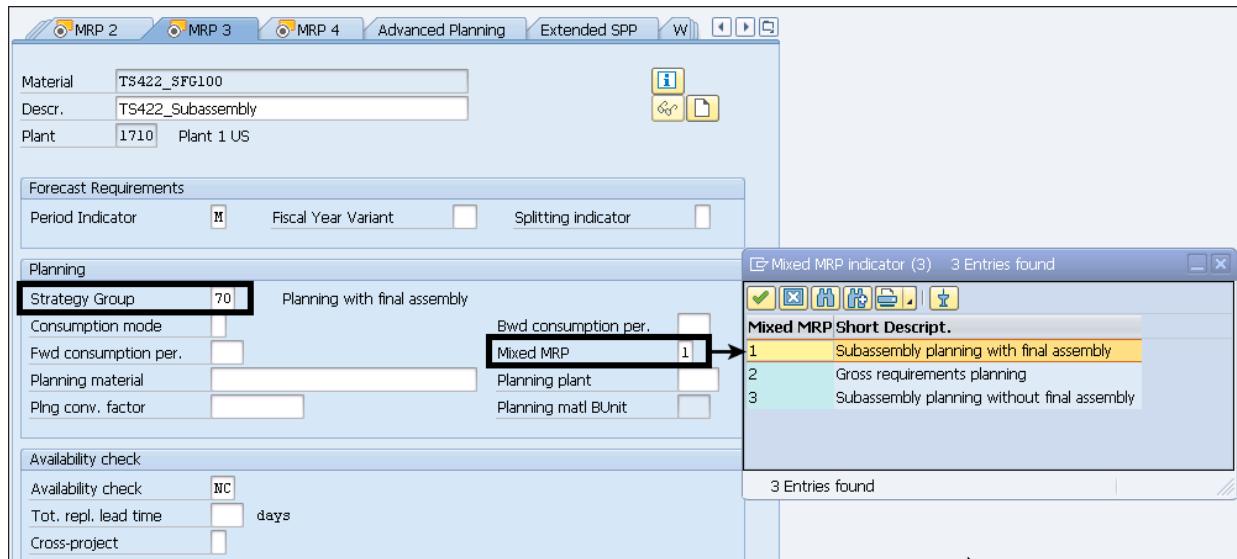


Figure 3.10 Planning at the Assembly Level: Material Master Setup

| | Strategy | Planning strategy description | Reqs-DM | Reqs-Cu. |
|--------------------------|----------|--|---------|----------|
| <input type="checkbox"/> | 81 | Assembly processing with planned orders | | KMSE |
| <input type="checkbox"/> | 82 | Assembly processing w. production orders | | KMFA |
| <input type="checkbox"/> | 83 | Assembly processing with networks | | KMNP |
| <input type="checkbox"/> | 84 | Service orders | | SERA |
| <input type="checkbox"/> | 85 | Assembly processing with network/project | | KMPN |
| <input type="checkbox"/> | 86 | Filling with process orders "Assembly" | | KMPA |
| <input type="checkbox"/> | 89 | Assembly proc. w. characteristics plng | VSE | KMSE |

Figure 3.11 ATO Planning Strategies (Transaction OPPS)

| | | | |
|---------------------------|-------------------------------------|-------------------|-------------------------------------|
| Reqmts class: | 201 | Assembly: | prod.order |
| Requirements | | Assembly | |
| Avail. Check: | <input checked="" type="checkbox"/> | Assembly type: | 2 |
| Req. transfer: | <input checked="" type="checkbox"/> | Order costing: | <input type="checkbox"/> |
| Allocation ind.: | <input type="checkbox"/> | Automatic plnng: | <input type="checkbox"/> |
| Prod.allocation: | <input type="checkbox"/> | Special Stock: | E |
| Ind.req.reductn: | <input type="checkbox"/> | Order Type: | PP04 |
| No MRP: | <input type="checkbox"/> | Avail.components: | <input checked="" type="checkbox"/> |
| Configuration | | Type comp.check: | <input type="checkbox"/> |
| Configuration: | <input type="checkbox"/> | Online assembly: | 3 |
| Cons.of config.: | <input type="checkbox"/> | Capacity check: | <input type="checkbox"/> |
| Costing | | No update: | <input type="checkbox"/> |
| Costing: | <input type="checkbox"/> | OCM: | <input type="checkbox"/> |
| Account assignment | | | |
| Acct Assgmt Cat: | M | Valuation: | M |

Figure 3.12 Requirements Class 201: For Assembly with Production Order



Figure 3.13 Maintain PIRs App

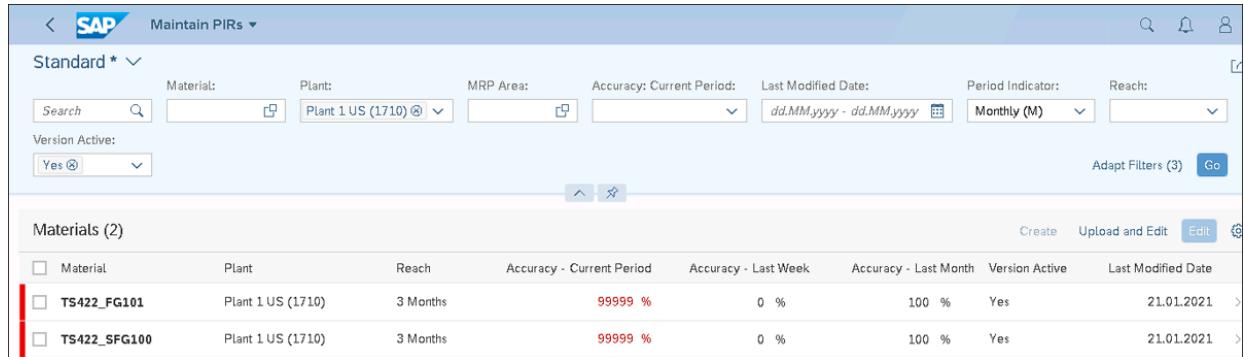


Figure 3.14 Maintain PIRs App: Key Figures

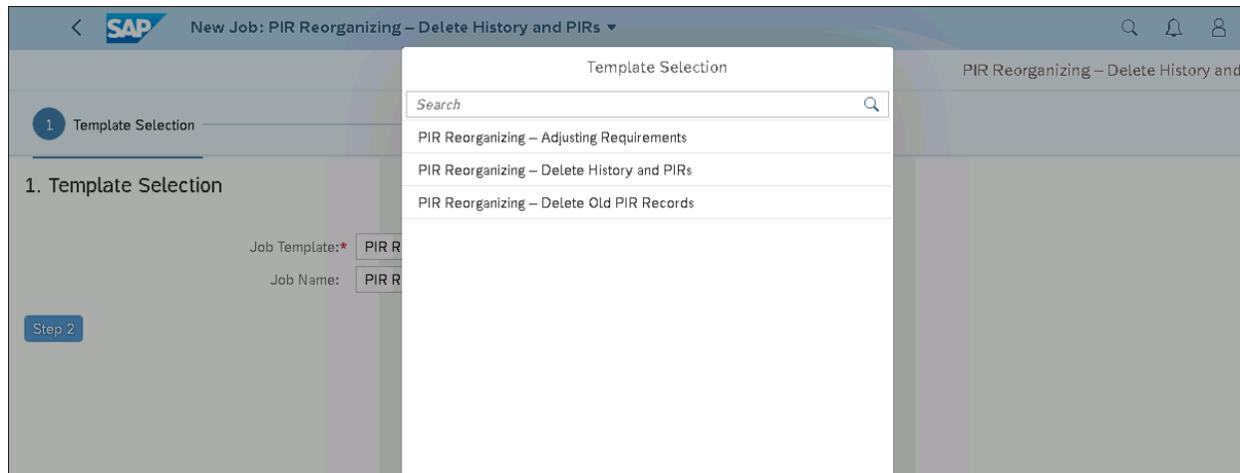


Figure 3.15 PIR Reorganization Run: Job Templates

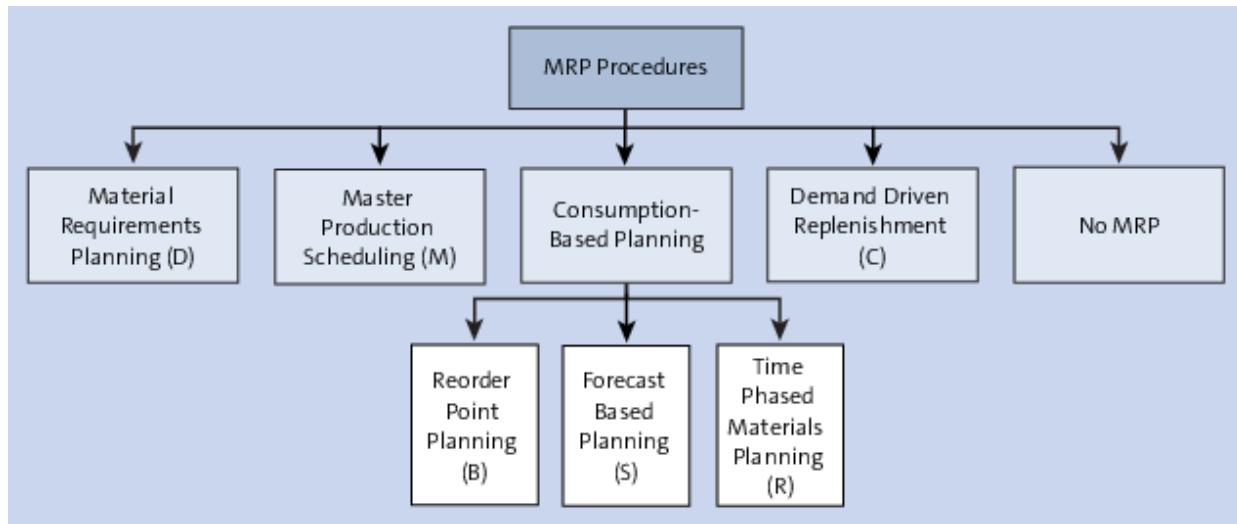


Figure 4.1 MRP Procedures

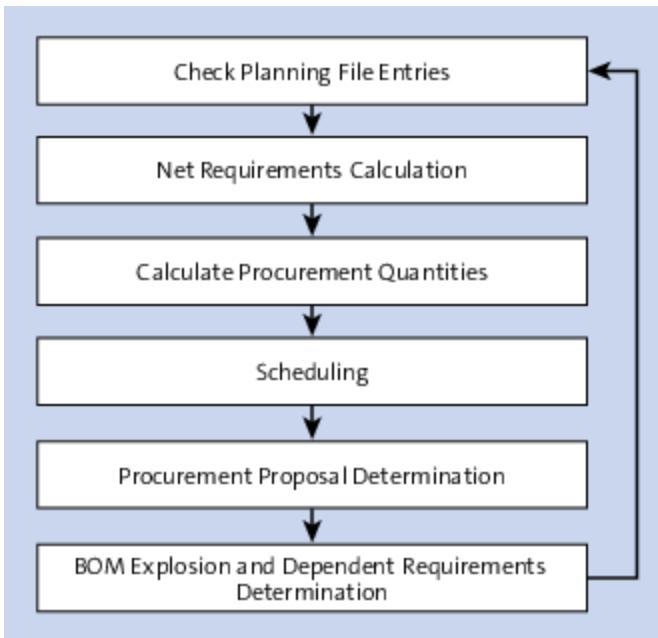


Figure 4.2 Process Steps in MRP

| Display planning file entries | | | | | | | |
|---|--------------|--------------|----------|----------|------------|------------|---------------|
| | | | | | | | |
| Plan. file entries | | | | | | | |
| Material | TS422_SFG102 | | | | | | |
| Plnt | 1710 | | | | | | |
| No. of entries | 1 | | | | | | |
| NETCH plnng file ent | 1 | | | | | | |
| NETPL plnng file ent | 1 | | | | | | |
| Current data from 24.02.2021 At 13:34 Tim | | | | | | | |
| R | Cde | Material | MRP Area | MPS Ind. | NChge plng | NChgePHor. | ResetProps |
| E | 002 | TS422_SFG102 | 1710 | | X | X | X |
| | | | | | | | Planning date |

Figure 4.3 Display Planning File Entries: Transaction MD21

MRP procedure

| | | |
|----------------|----|----------------------|
| MRP Type | PD | Forecast Consumption |
| Reorder Point | | |
| Planning cycle | | |

Lot size data

| | | |
|----------------------|----|-------------------|
| Lot Sizing Procedure | EX | Lot-for-lot order |
| Minimum Lot Size | | |
| Fixed lot size | | |
| LS-Independent Costs | | |
| Assembly scrap (%) | | |
| Rounding Profile | | |

Lot Sizing Procedure within Materials Planning (1) 7 Entries found

| LSP | LS | LI | Pds | LLP | LLI | LPer | Description |
|-----|----|----|-----|-----|-----|------|----------------------------------|
| EX | S | E | 0 | 0 | 0 | 0 | Lot-for-lot order quantity |
| FX | S | F | 0 | 0 | 0 | 0 | Fixed order quantity |
| H1 | S | H | 0 | 0 | 0 | 0 | Replenish to maximum stock level |
| HB | S | H | 0 | 0 | 0 | 0 | Replenish to maximum stock level |
| MB | P | M | 1 | 0 | 0 | 0 | Monthly lot size |
| TB | P | T | 1 | 0 | 0 | 0 | Daily lot size |
| WB | P | W | 1 | 0 | 0 | 0 | Weekly lot size |

Figure 4.4 Lot-Sizing Procedure in the Material Master

| Lot size data | |
|----------------------------|----------------------|
| Lot Sizing Procedure | EX |
| Minimum Lot Size | <input type="text"/> |
| Fixed lot size | <input type="text"/> |
| LS-Independent Costs | <input type="text"/> |
| Assembly scrap (%) | 10 |
| Rounding Profile | <input type="text"/> |
| Lot-for-lot order quantity | <input type="text"/> |
| Maximum Lot Size | <input type="text"/> |
| Maximum Stock Level | <input type="text"/> |
| Storage Costs Code | <input type="text"/> |
| Takt time | <input type="text"/> |
| Rounding value | <input type="text"/> |

Figure 4.5 Assembly Scrap in the MRP 1 View

| BOM explosion/dependent requirements | | | |
|--|-------------------------------------|---|--------------------------|
| Individual/coll. | 2 | Component Scrap (%) | 5 |
| Version Indicator | <input checked="" type="checkbox"/> | Requirements group | <input type="checkbox"/> |
|  ProdVersions | | MRP dep.requirements <input type="checkbox"/> | |

Figure 4.6 Component Scrap in the MRP 4 View

| Quantity Data | | | |
|----------------------|-------------------------------------|---------------------|---|
| Quantity | 1 | PC | Fixed Quantity <input type="checkbox"/> |
| Operation scrap in % | 2 | Component Scrap (%) | 5 |
| Net ID | <input checked="" type="checkbox"/> | | |

Figure 4.7 Component Scrap and Operation Scrap in the BOM

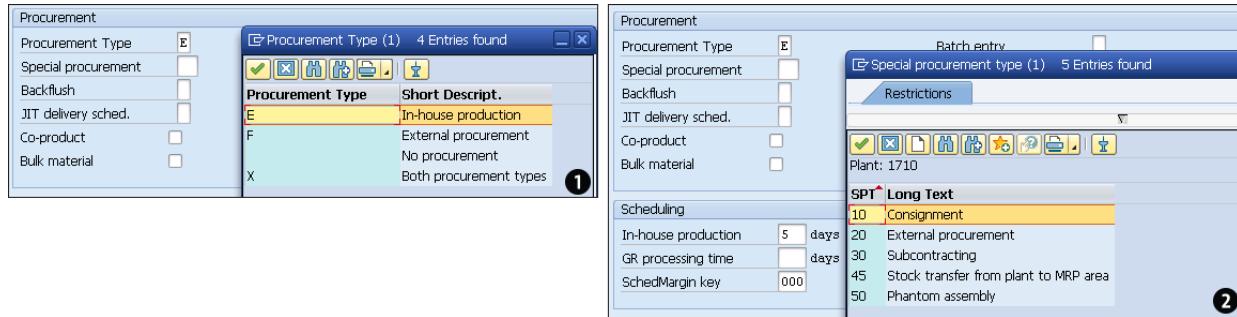


Figure 4.8 Material Master MRP 2 View: Procurement Type and Special Procurement Type

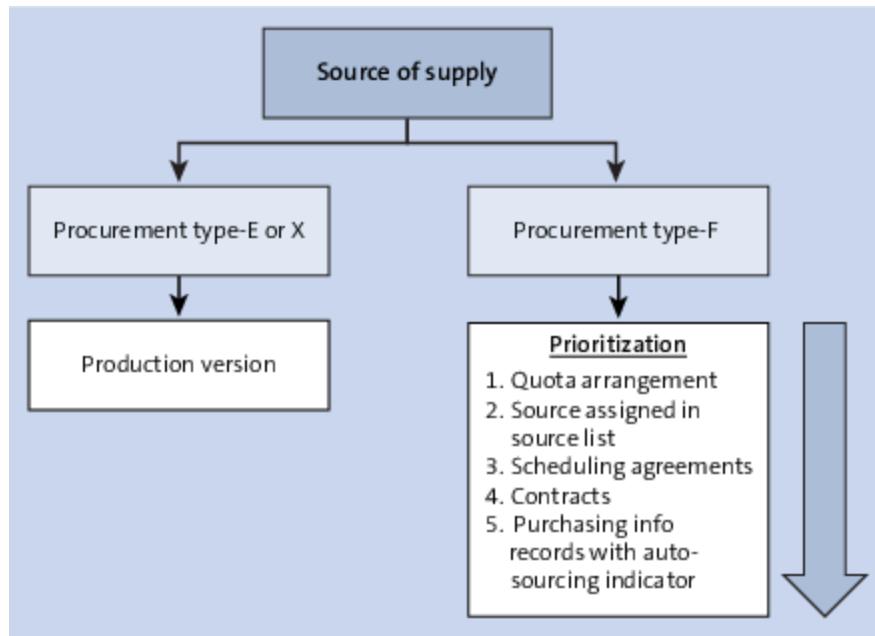


Figure 4.9 Source of Supply Determination

| MRP Type | MRP Type Description |
|----------|---|
| D1 | Demand-Driven Replenishment, fixing type -1- |
| M0 | MPS, FCST Consumption, No Firming |
| M1 | MPS, FCST Consumption, Auto Firming, New Ords after PTF |
| M2 | MPS, FCST Consumption, Auto Firming, No New Ords in PTF |
| M3 | MPS, FCST Consumption, Manual Firming, New Ords after PTF |
| M4 | MPS, FCST Consumption, Manual Firming, No New Ords in PTF |
| ND | No planning |
| P1 | Forecast Consumption, Auto Firming, New Ords after PTF |
| P2 | Forecast Consumption, Auto Firming, No New Ords in PTF |
| P3 | Forecast Consumption, Manual Firming, New Ords after PTF |
| P4 | Forecast Consumption, Manual Firming, No New Ords in PTF |
| PD | Forecast Consumption, No Planning Time Fence |
| R1 | Time-phased planning |
| R2 | Time-phased w.auto.reord.point |
| RE | Replenishment plnd externally |
| RF | Replenish with dyn.TargetStock |
| RP | Replenishment |
| RR | Time-phased replenishment with dynamic target stock |
| RS | Time-phased replenishment planning |
| V1 | Manual reord.point w. ext.reqs |
| V2 | Autom. reord.point w. ext.reqs |
| VB | Reorder-Point Planning |
| VI | Vendor Managed Inventory |
| VM | Automatic reorder point plng |
| VS | Seasonal MRP |
| VV | Forecast-based planning |
| X0 | W/O MRP, with BOM Explosion |

Figure 4.10 MRP Types (Customization)

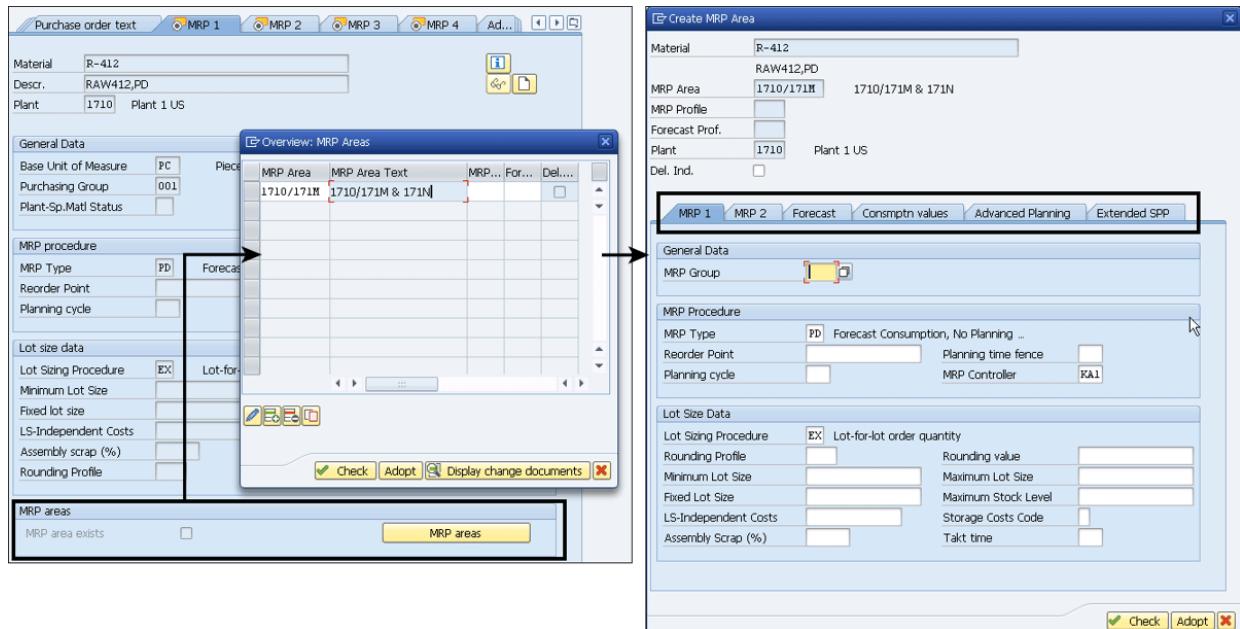


Figure 4.11 MRP Areas in the MRP 1 View

| Display planning file entries | | | | | | | | | |
|--|-----|----------|-----------|----------|------------|------------|------------|------------|---------------|
| | | | | | | | | | |
| Plan. file entries | | | | | | | | | |
| Material R-412 Plnt 1710 | | | | | | | | | |
| No. of entries | 2 | | | | | | | | |
| NETCH plng file ent | 1 | | | | | | | | |
| NETPL plng file ent | 1 | | | | | | | | |
| <i>Current data from 29.03.2021 At 19:03 Tim</i> | | | | | | | | | |
| R | Cde | Material | MRP Area | MPS Ind. | NChge plng | NChgePHor. | ResetProps | ExplodeBOM | Planning date |
| B | 003 | R-412 | 1710 | | | | | | |
| B | 003 | R-412 | 1710/171M | | X | X | | | |

Figure 4.12 Storage Location MRP Area and Planning File Entries

< Purchase order text MRP 1 MRP 2 MRP 3 MRP 4

Planning Calendar (1) 3 Entries

MRP procedure

* MRP Type: **R1** Time-p

Reorder Point:

Planning cycle: **SK1**

Lot size data

Restrictions

| Cal | Description |
|-----|---------------------------|
| MSK | Tuesday |
| SK1 | 2nd Tuesday of each month |
| SK2 | Tuesday-Thursday |

Figure 4.13 Planning Cycle/Planning Calendar

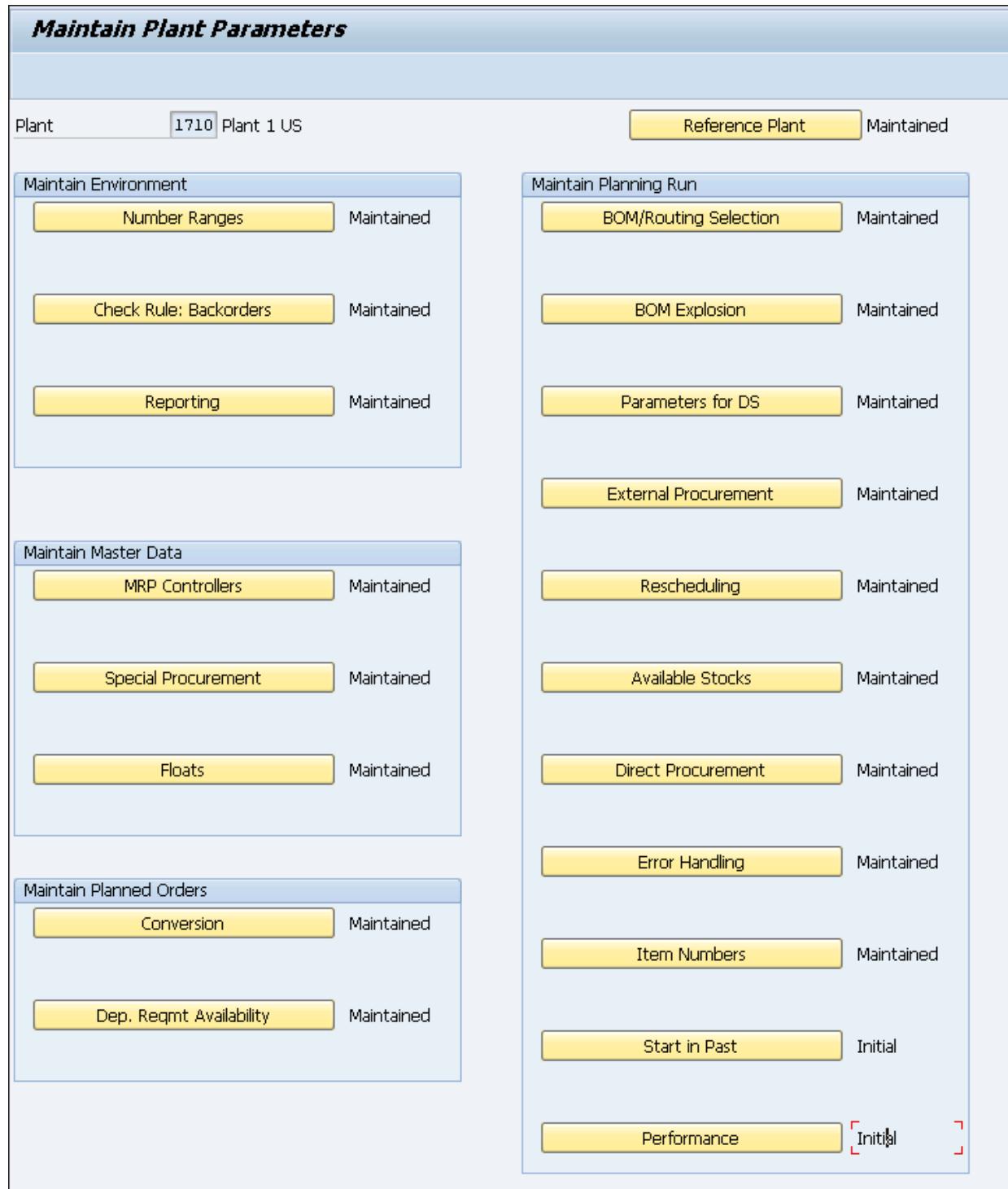


Figure 4.14 Maintain MRP Parameters

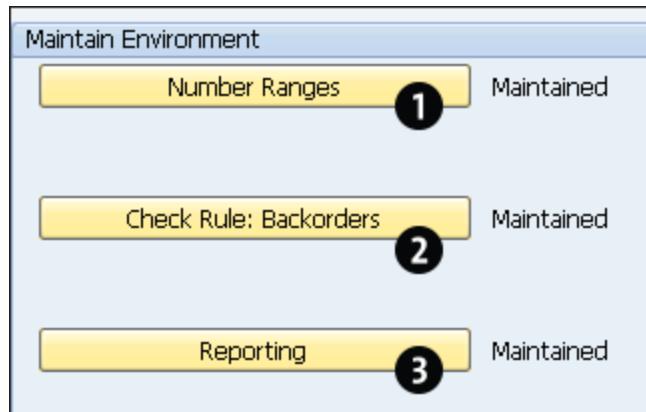


Figure 4.15 Maintain Environment

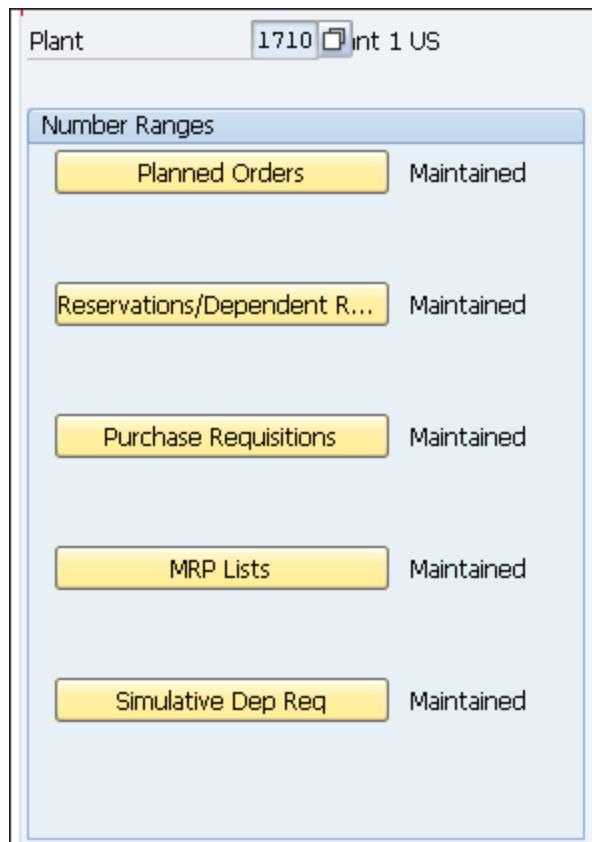


Figure 4.16 Maintain MRP Number Ranges

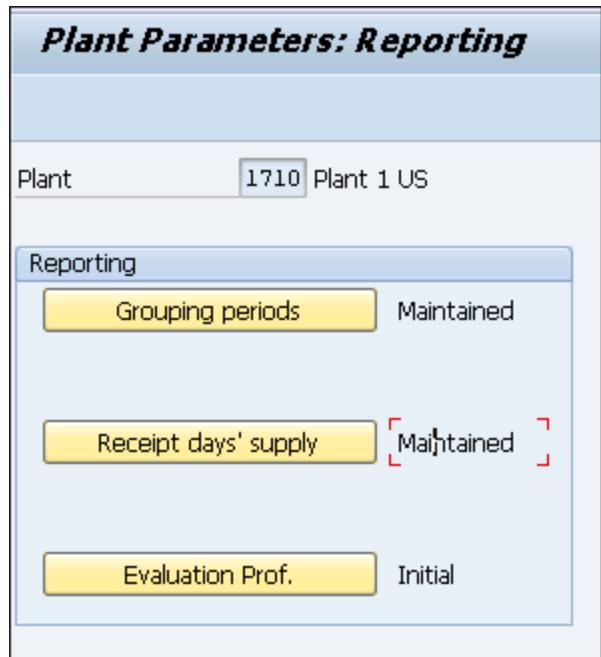


Figure 4.17 Plant Parameters: Reporting

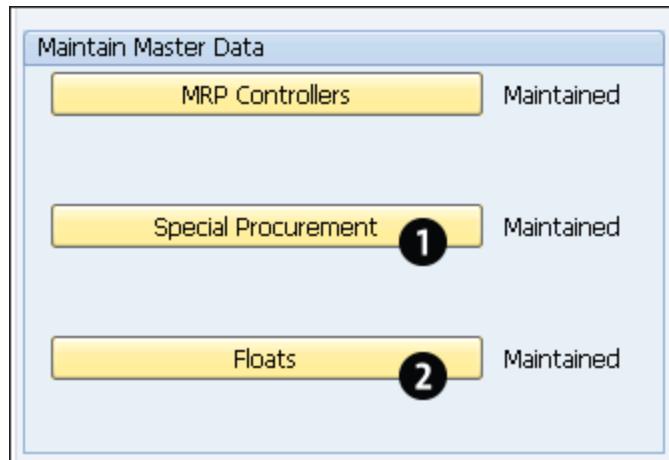


Figure 4.18 Maintain Master Data

| | | |
|--|----------------------|----------------------|
| Plant | 1710 | Plant 1 US |
| Sp.Pr.Type | 50 | Phantom assembly |
| Procurement type | E | In-house production |
| Special Procurement | | |
| Special procurement | E | In-house production |
| Plant | <input type="text"/> | |
| As BOM Component | | |
| <input checked="" type="checkbox"/> Phantom item | | |
| <input type="checkbox"/> Direct Production | | |
| <input type="checkbox"/> Direct Procurement | | |
| <input type="checkbox"/> Withdr.altern.plant | Issuing Plant | <input type="text"/> |
| <input type="checkbox"/> Multil. Subcontr. | | |

Figure 4.19 Special Procurement: Phantom Assembly

| Change View "Floats for Scheduling": Overview | | | | | | | |
|---|------|------------|-------|--------|---------|----------|-----------|
| | Plnt | Name 1 | Ma... | Op.... | Fl Bef. | Fl After | Rel. Per. |
| | 1710 | Plant 1 US | 000 | | | | |
| | 1710 | Plant 1 US | 001 | 10 | 2 | 1 | 5 |
| | 1710 | Plant 1 US | 002 | 2 | 1 | | 1 |
| | | | | | | | |

Figure 4.20 Floats for Scheduling

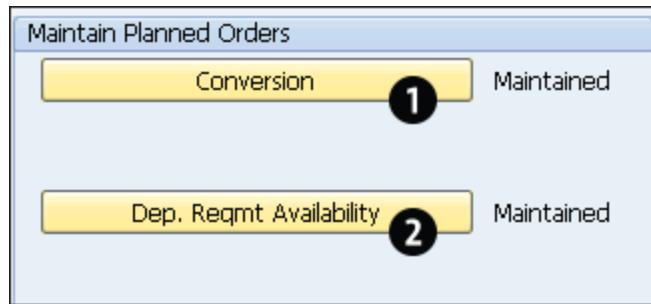


Figure 4.21 Maintain Planned Orders

A screenshot of a SAP Fiori application interface. At the top, there is a toolbar with several icons: a magnifying glass, a double arrow, a green square, a blue square, a red square, and a document icon. Below the toolbar is a table with three columns: 'Plnt' (Plant), 'Name 1' (Name), and 'Avail. Check Rule'. The first row contains the value '1710' in the 'Plnt' column, 'Plant 1 US' in the 'Name 1' column, and 'P1' in the 'Avail. Check Rule' column. The second row is empty. To the right of the table is a vertical toolbar with a yellow square icon and up/down arrow buttons.

| Plnt | Name 1 | Avail. Check Rule |
|------|------------|-------------------|
| 1710 | Plant 1 US | P1 |
| | | |

Figure 4.22 Availability Check Rule for Planned Orders

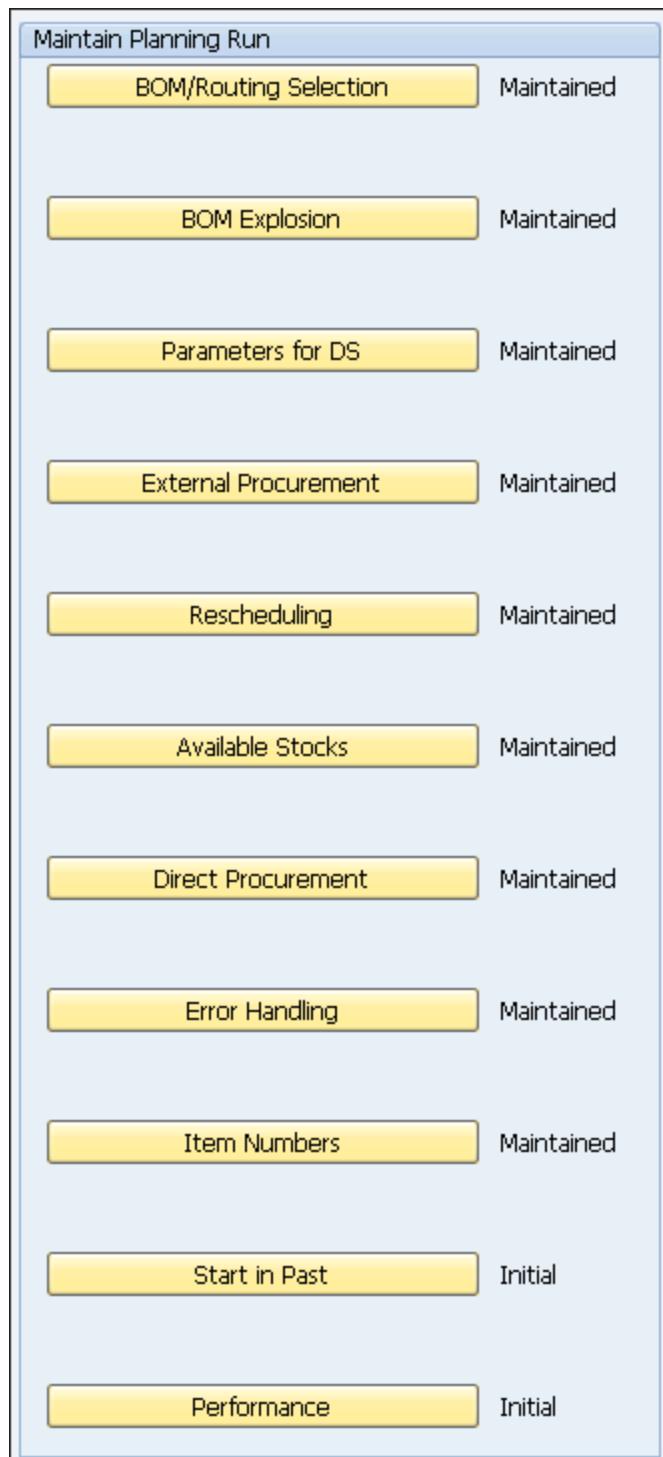


Figure 4.23 Maintain Planning Run

Change View "Scheduling planned orders": Details

The screenshot shows the SAP interface for 'Change View "Scheduling planned orders": Details'. The dialog structure on the left includes 'New Entries' and a tree view with 'Scheduling planned order' selected. The main area contains several sections:

- Plant:** 1710 Plant 1 US
- Order type:** LA Stock order
- Prod'n Supervisor:** YB1 MTS DI - Valuated
- Long-term planning:** An unchecked checkbox.
- Detailed Scheduling:**
 - Scheduling
 - Generate Capacity Reqs.
- Adjust Scheduling:**
 - Takt Time/Rate-Based Sched.
 - Adjust Dates:** A dropdown menu set to 'Adjust basic dates, adjust dep. reqmts to operation date'.
 - In Capacity Scheduling:** A dropdown menu set to 'Always basic dates, dep.reqmts to operation dates'.
- Scheduling Control for Detailed Scheduling:**
 - Scheduling Type:** A dropdown menu set to 'Backwards' (highlighted with a red box).
 - Automatic Log
 - Latest Staging Date
 - Scheduling with Breaks
- Reduction:**
 - Reduction Type:** A dropdown menu set to 'All operations in the order will be reduced'.
 - Maximum Reduction Level:** A dropdown menu set to '0 Do not reduce'.
 - % Reduction in Floats:** A row of six checkboxes labeled I1 through I6.

Figure 4.24 Parameters for Detailed Scheduling of Planned Orders

Change View "Plant Rescheduling": Details

Plant 1710 Plant 1 US

Rescheduling horizon 30

| Firmed elements | Comparison values |
|---|---|
| <input checked="" type="checkbox"/> Firmed Planned Orders | Tolerance value forward <input type="text" value="2"/> |
| <input checked="" type="checkbox"/> Production order | Tolerance value for displacemt <input type="text" value="2"/> |
| <input checked="" type="checkbox"/> Fixed Purchase Requisitions | |
| <input checked="" type="checkbox"/> PO/SA Schedule Line | |
| <input checked="" type="checkbox"/> QM inspection lot | |
| <input checked="" type="checkbox"/> Shipping notificat. | |

Figure 4.25 Rescheduling

Change View "Default Values for Direct Procurement": Details

60 60

Plant 1710 Plant 1 US

Direct procurement/production 2

Account Assignment

Acc.asst unknown:direct procmt U

The screenshot shows the SAP Fiori interface for configuring default values for direct procurement. The title bar reads 'Change View "Default Values for Direct Procurement": Details'. Below the title are standard SAP navigation icons. A 'Plant' field contains '1710' and 'Plant 1 US'. Under 'Direct procurement/production', there is a value '2' with a search icon. An 'Account Assignment' section contains the text 'Acc.asst unknown:direct procmt' followed by a button labeled 'U'. The entire interface is presented in a clean, modern design typical of SAP's mobile-optimized Fiori applications.

Figure 4.26 Default Values for Direct Procurement

| Change View "Error Handling in the Planning Run": Overview | | | | | |
|--|------|------------|----------------|-------|--------------------|
| | Plnt | Plant Name | Max. Proposals | Subs. | Controller name |
| | 1710 | Plant 1 US | 50 | 001 | MRP Controller 001 |

Figure 4.27 Error Handling in the Planning Run

Change View "Item Numbers": Overview

The screenshot shows a SAP Fiori application titled "Change View 'Item Numbers': Overview". The interface includes a toolbar with various icons at the top. Below the toolbar is a table with four columns: "Plnt", "Plant Name", "Item PR", and "Item No. Stock Trans. Res.". A single row is present in the table, corresponding to the value "1710" in the "Plnt" column and "Plant 1 US" in the "Plant Name" column. In the "Item PR" column, the value "10" is listed. In the "Item No. Stock Trans. Res." column, the value "100" is entered, highlighted with a yellow background and a red border. The table has scroll bars on the right side.

| Plnt | Plant Name | Item PR | Item No. Stock Trans. Res. |
|------|------------|---------|----------------------------|
| 1710 | Plant 1 US | 10 | 100 |

Figure 4.28 Define Line-Item Numbers

| Change View "Order Proposals in the Past": Overview | | | | |
|---|------------|---------------|--------------------------|--|
| | | | | |
| Plant | Name 1 | Start in Past | <input type="checkbox"/> | |
| 1710 | Plant 1 US | | | |

Figure 4.29 Order Proposal in the Past

| Change View "Performance: BOM Buffering in Shared Buffer": Overview | | | |
|---|------------|-----------|--|
| | | | |
| Performance: BOM Buffering in Shared Buffer | | | |
| Plant | Name 1 | Buffering | |
| 1710 | Plant 1 US | | |
| | | | |

Figure 4.30 Performance: BOM Buffering

| MRP control parameters | | |
|------------------------|------------|--|
| Processing key | NETCH | Net Change in Total Horizon |
| Create purchase req. | 2 | Purchase requisitions in opening period |
| Schedule lines | 3 | Schedule lines |
| Create MRP list | 1 | MRP list |
| Planning mode | 1 | Adapt planning data (normal mode) |
| Scheduling | 1 | Determination of Basic Dates for Planned |
| Planning date | 03.04.2021 | |

Figure 4.31 Control Parameters for Classic MRP

MRP Run

Scope of planning

Plant

MRP control parameters

| | | |
|----------------------|-------|---|
| Processing key | NETCH | Net Change in Total Horizon |
| Create purchase req. | 2 | Purchase requisitions in opening period |
| Schedule lines | 3 | Schedule lines |
| Create MRP list | 1 | MRP list |
| Planning mode | 1 | Adapt planning data (normal mode) |

Scheduling 1 Determination of Basic Dates for Planned

Planning date 03.04.2021

Process control parameters

Parallel processing
 Display material list

User exit: select materials for planning

User exit key

User exit parameter

Figure 4.32 Classic MRP: Total Planning Run (MD01)

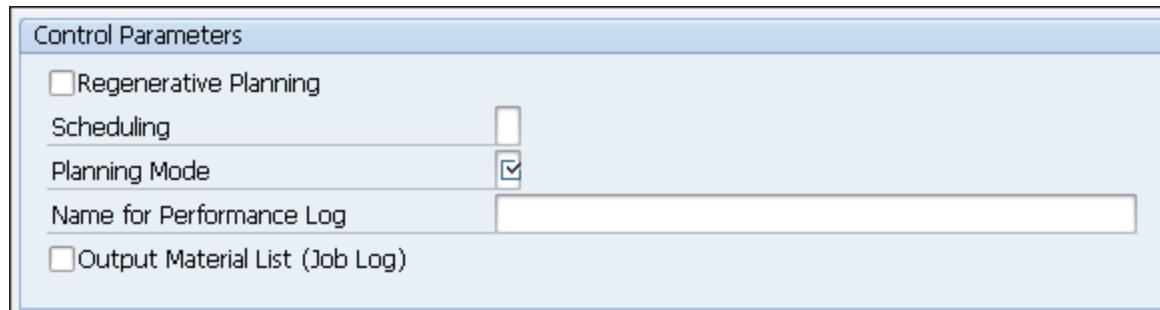


Figure 4.33 Control Parameters for MRP Live

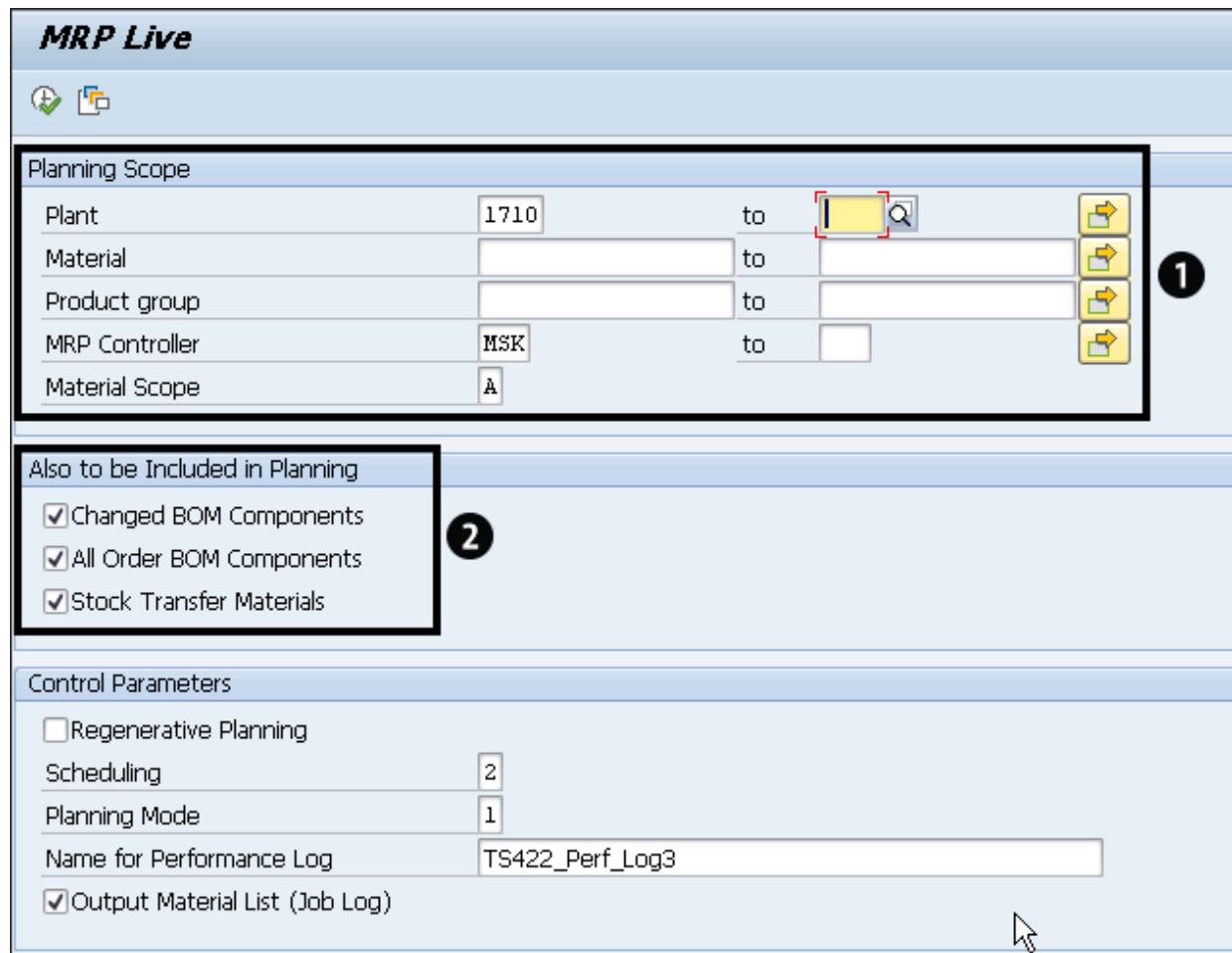


Figure 4.34 MRP Live Selection Screen

| MRP Live Performance Log | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|-----|------|-----|-------|------|-------------|------------|------------|----------|----------|------------|-----------|------------|-----------|-------------|------------|-----------|------------|------------|----------|----------|----------|--------|-----|-------------|-------------|-------------|-----------|-----------|----|
| Code Step | | Matf | fPg | Matls | PInd | Matl.Failed | Start Date | Start Time | Elapsed | ConsTime | Time Mast. | Time Docs | Time Calc. | Time Upd. | Time PRUpd. | Time PLAFd | Time PLAF | Time Schdl | Time Q.Qty | PurRpDel | PurRpCrd | PurRpUpd | PurDoc | Upd | Schline Del | Schline Ins | Schline Upd | PldOrdDel | PldOrdCrt | |
| 000 Preparation | | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:07 | 00:00:01 | 1,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 000 MRP Live on HANA | 34 | 34 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:07 | 00:00:08 | 32,745 | 1,568 | 5,177 | 21,900 | 2,418 | 0,484 | 0,678 | 0,248 | 0,394 | 0,010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 000 Scheduling | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:13 | 00:00:10 | 19,514 | 0,000 | 0,000 | 18,863 | 0,394 | 0,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 001 Preparation | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:14 | 00:00:11 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 001 MRP Live on HANA | 73 | 73 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:23 | 00:00:09 | 35,809 | 3,539 | 5,001 | 18,991 | 3,799 | 1,133 | 1,066 | 0,277 | 0,306 | 0,012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 37 |
| 001 Classic MRP | 1 | 1 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:28 | 00:00:01 | 0,801 | 0,000 | 0,392 | 0,017 | 0,443 | 0,000 | 0,000 | 0,000 | 0,000 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 001 Scheduling | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:28 | 00:00:04 | 9,781 | 0,000 | 0,000 | 5,399 | 0,174 | 0,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 002 Preparation | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:32 | 00:00:00 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 002 MRP Live on HANA | 40 | 40 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:32 | 00:00:07 | 43,153 | 3,258 | 7,130 | 19,899 | 5,923 | 2,062 | 0,966 | 1,433 | 0,646 | 0,017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 |
| 002 Classic MRP | 1 | 1 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:38 | 00:00:01 | 0,739 | 0,000 | 0,050 | 0,011 | 0,141 | 0,000 | 0,000 | 0,000 | 0,000 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 002 Postprocessing | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:38 | 00:00:01 | 0,530 | 0,000 | 0,000 | 0,000 | 0,000 | 1,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 116 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 002 Scheduling | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:38 | 00:00:02 | 1,775 | 0,000 | 0,000 | 1,699 | 0,033 | 0,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 003 Preparation | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:40 | 00:00:00 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 003 MRP Live on HANA | 7 | 7 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:40 | 00:00:06 | 20,616 | 1,104 | 2,648 | 12,346 | 1,818 | 0,627 | 0,173 | 0,165 | 0,326 | 0,011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 003 Postprocessing | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:44 | 00:00:01 | 0,322 | 0,000 | 0,000 | 0,000 | 0,000 | 1,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 999 Preparation | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:46 | 00:00:00 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 999 MRP Live on HANA | 106 | 106 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:46 | 00:00:07 | 42,443 | 3,031 | 6,773 | 18,384 | 4,323 | 1,663 | 0,581 | 0,472 | 0,677 | 0,019 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 999 Postprocessing | 0 | 0 | 0 | 0 | 0 | 0 | 04-04-2021 | 01:40:51 | 00:00:02 | 0,551 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Figure 4.35 MRP Live Performance Log

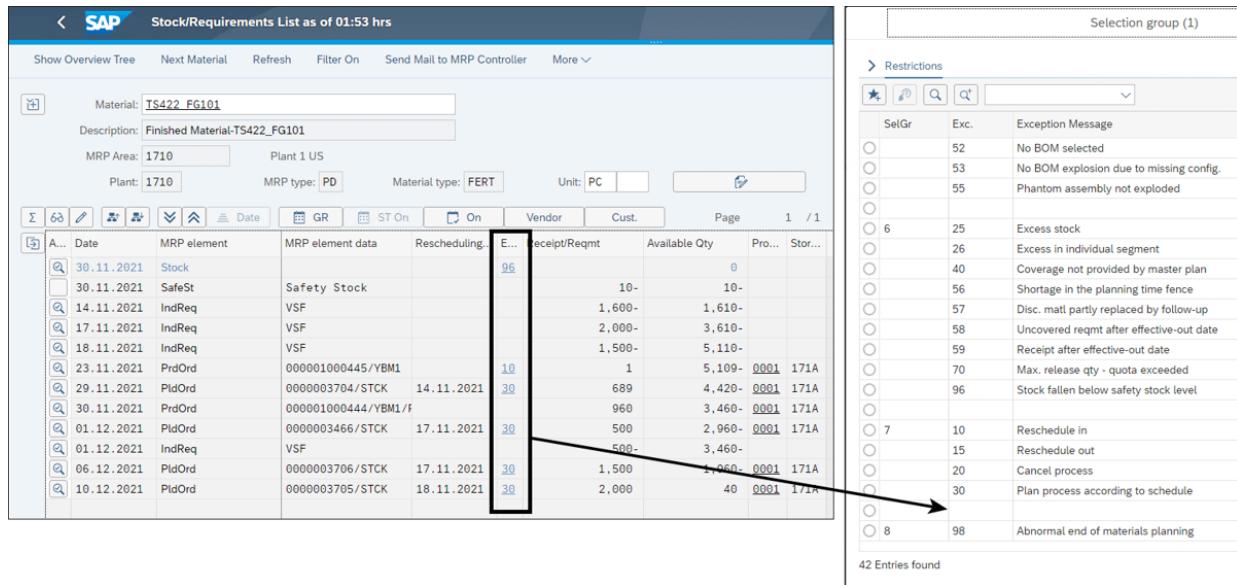


Figure 4.36 Stock/Requirements List – Individual Access

SAP Stock/Requirements List: Material List

Selected Stock/Requirements Lists Define Traffic Light Exception Groups More ▾

Plant: 1710 Plant 1 US
MRP Controller: 001 MRP Controller 001

60

| Light | Valid from date | Material | Ext. Manuf | MRP Area | Material description | Alr... | StckDS | 1st RDS | 2nd R | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------------|-----------------|-------------|------------|----------|--------------------------------------|--------------------------|--------|---------|--------|---|---|---|---|---|---|---|
| <input type="checkbox"/> | | TS422_FG101 | | 1710 | Finished Material-TS422_FG101 | <input type="checkbox"/> | 999.9- | 17.0- | 17.0- | | | | | | 1 | 5 |
| <input type="checkbox"/> | | TS422_FG106 | | 1710 | Finished Product TS422_FG106 | <input type="checkbox"/> | 999.9- | 1.0- | 1.0- | | | | | | 1 | 1 |
| <input type="checkbox"/> | | FG126 | | 1710 | FIN126,MTS-DI,PD,SerialNo | <input type="checkbox"/> | 999.9- | 999.9 | 999.9 | | | | | | 1 | 1 |
| <input type="checkbox"/> | | TS422_FG105 | | 1710 | Finished Product TS422_FG105 | <input type="checkbox"/> | 999.9- | 999.9 | 999.9 | | 1 | | | | 1 | 1 |
| <input type="checkbox"/> | | FG233 | | 1710 | FERT 233, PD, Repetitive Manuf. | <input type="checkbox"/> | 394.0- | 394.0- | 394.0- | | 1 | | | | 4 | |
| <input type="checkbox"/> | | FG29 | | 1710 | FIN29,MTS-PI,PD,Batch-ExpirationDate | <input type="checkbox"/> | 227.0- | 227.0- | 227.0- | | | | | | 1 | |
| <input type="checkbox"/> | | FGPCDG01 | | 1710 | Finished Good DG 5l | <input type="checkbox"/> | 227.0- | 227.0- | 227.0- | | | | | | 1 | |
| <input type="checkbox"/> | | TS422_FG100 | | 1710 | TS422-FG100 - Finished Material | <input type="checkbox"/> | 80.0- | 80.0- | 80.0- | | | | | | 8 | |
| <input type="checkbox"/> | | FG228 | | 1710 | FIN228,MTO,PD,Batch-Fifo | <input type="checkbox"/> | 32.0- | 32.0- | 32.0- | | | | | | 1 | |
| <input type="checkbox"/> | | EWMS4-50 | | 1710 | FIN50, Fast Moving | <input type="checkbox"/> | 999.9 | 999.9 | 999.9 | | | | | | | |
| <input type="checkbox"/> | | F-10A | | 1710 | FIN10A,MTS-DDMRP,PD | <input type="checkbox"/> | 999.9 | 999.9 | 999.9 | | | | | | | |

Figure 4.37 Stock/Requirements List – Collective Access

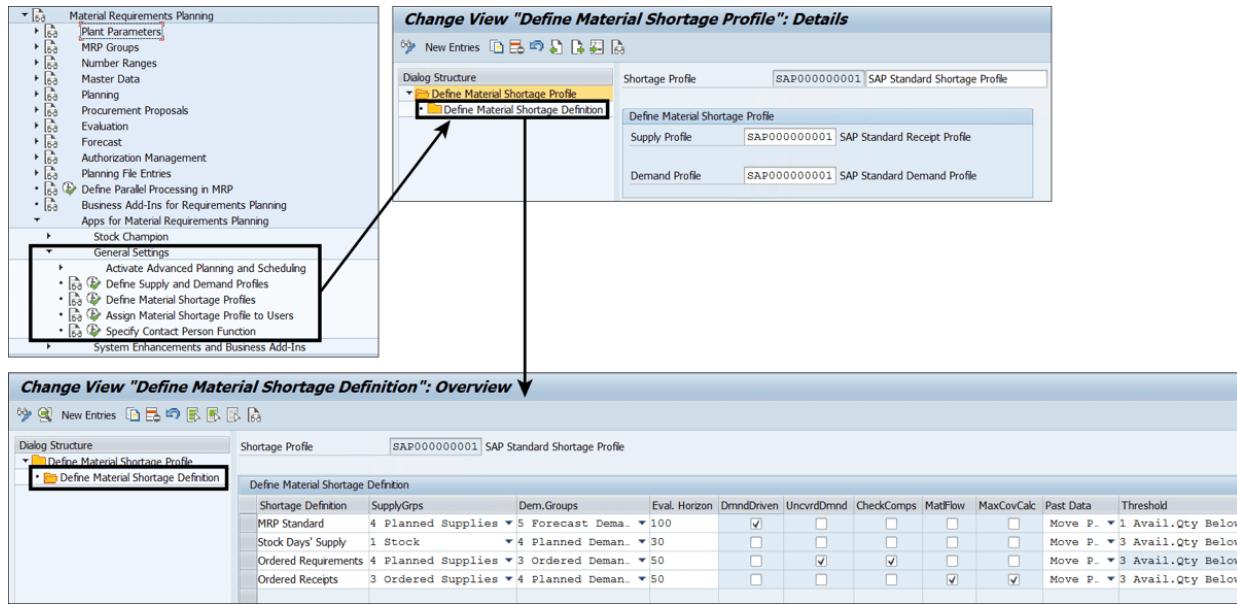


Figure 4.38 Material Shortage Profile and Definition

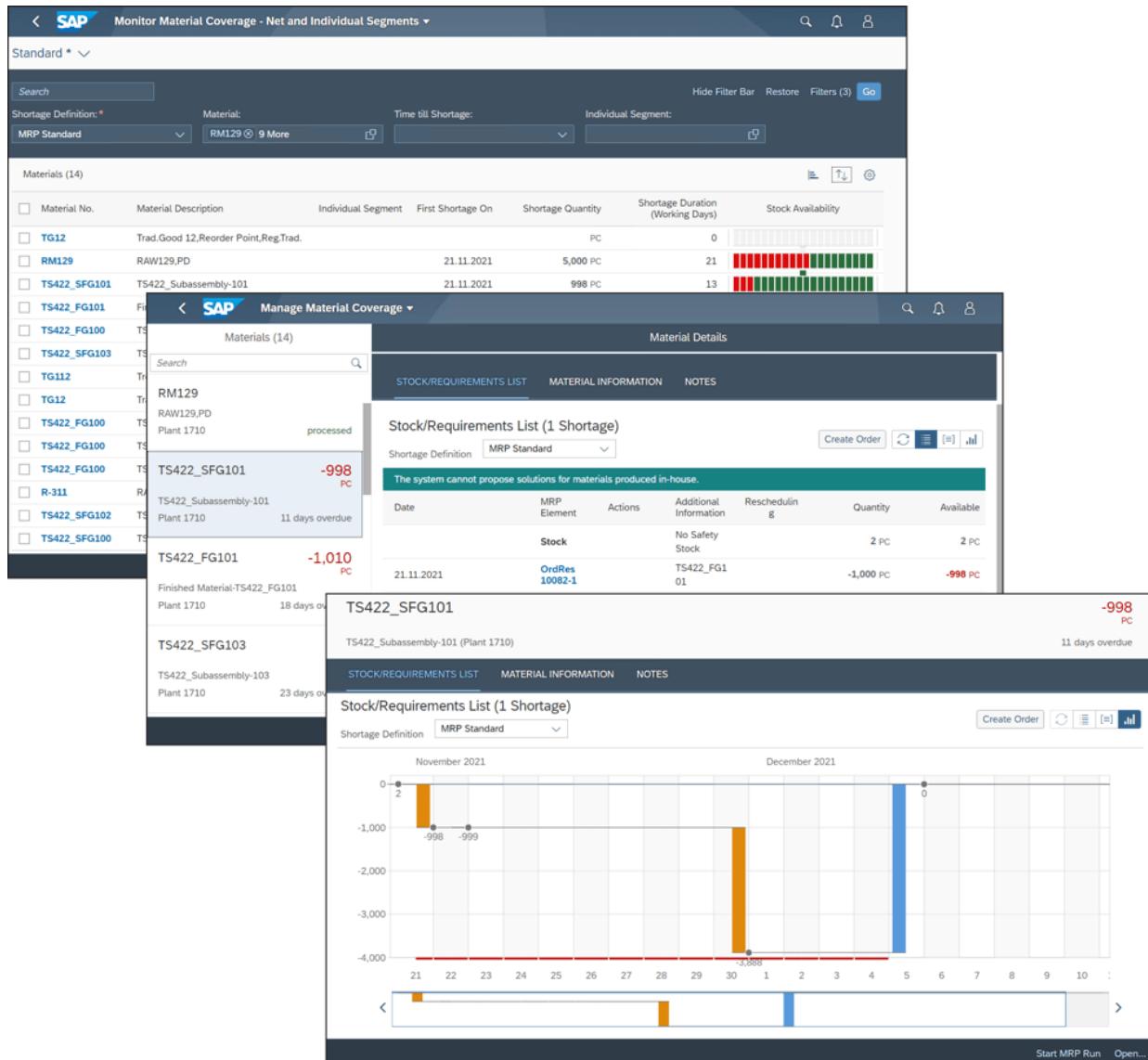


Figure 4.39 Monitor and Manage Material Coverage – Net and Individual Segments App

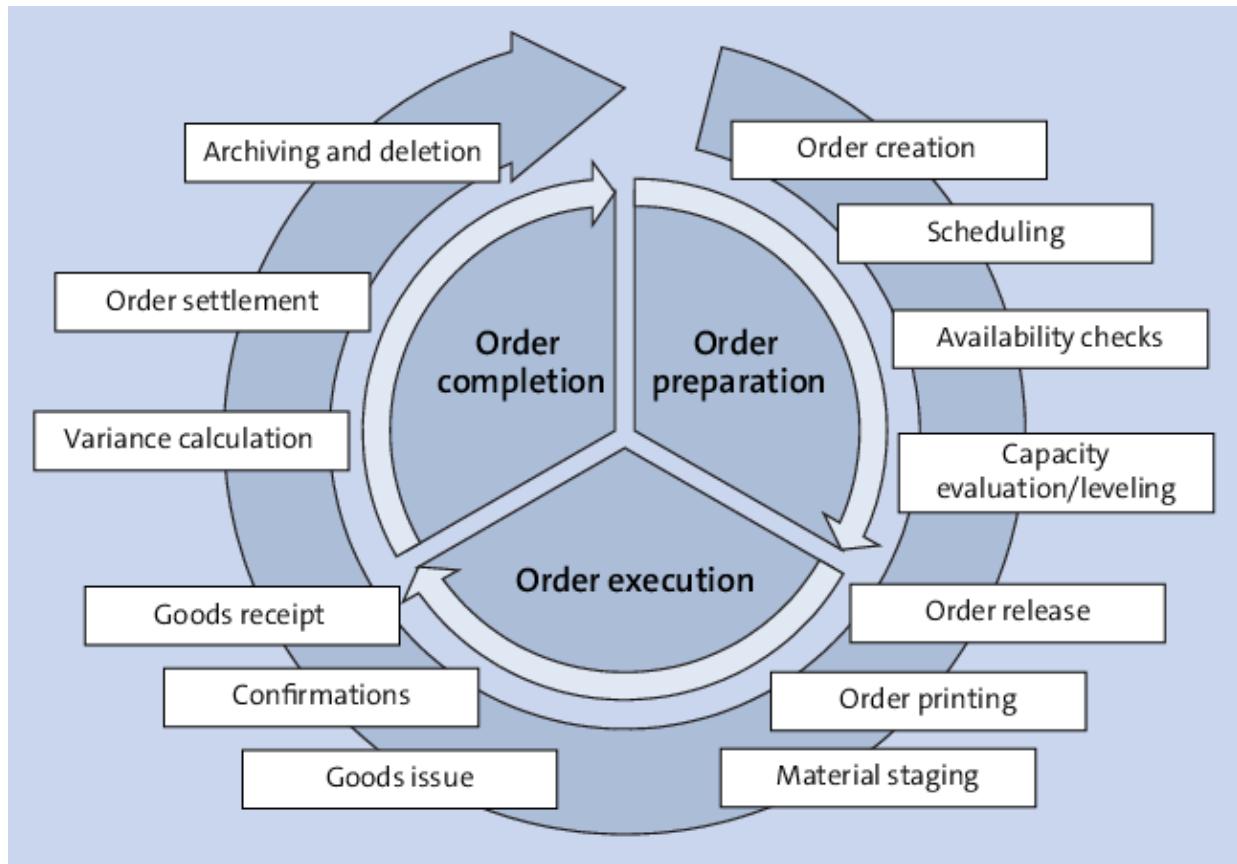


Figure 5.1 Production Orders: Process Flow

Production order Change: Header

The screenshot shows the SAP Production Order Change: Header interface. At the top, there's a toolbar with various icons for material, capacity, operations, components, documents, sequences, and other functions. Below the toolbar, the header information is displayed:

- Order: 1000323
- Material: TS422_FG101
- Status: CRTD MSPT PRC CSER SETC
- Type: YBM1
- Plant: 1710

The main area contains several tabs: General, Assignment, Goods Receipt, Control, Dates/Quantities, Master Data, Long Text, Administration, Items, and Fast Entry. The Dates/Quantities tab is currently selected.

Dates/Times section (Visible in screenshot):

| Basic Dates | | Scheduled | | Confirmed | |
|-------------|------------|-----------|------------|-----------|-------|
| End | 10.09.2021 | 00:00 | 09.09.2021 | 16:00 | |
| Start | 09.09.2021 | 00:00 | 09.09.2021 | 14:41 | 00:00 |
| Release | 09.09.2021 | | | | |

Scheduling section (Visible in screenshot):

| Scheduling | | Floats | |
|------------|--------------------------|-------------------|----------|
| Type | 2 Backwards | Sched. Margin Key | 000 |
| Reduction | No reduction carried out | Float Bef. Prdn | Workdays |
| Note | No scheduling note | Float After Prdn | Workdays |
| Priority | | Release Period | Workdays |

Figure 5.2 Production Order: Header Data

Production Order Change: Operation - Details

| | | | |
|---------------|-----------------|-----------------|----------|
| Order | 1000323 | Type | YBM1 |
| Material | TS422_FG101 | Plant | 1710 |
| Operation | 0010 / | Opr. short text | Assembly |
| Work Center | ASSEMBLY / 1710 | Control Key | YBP1 |
| System Status | CRTD | Operation ID | 00000010 |
| | | Confirmation | 904 |

General StandardVals Ext. Processing Interop. Times Standard Value Calc. Splitting Overlap Dat...

General

| | | | |
|-----------------|------------------------|------|-----------------------------|
| Sequence Number | <input type="text"/> | Cost | X 100% Relevant to Costi... |
| Scrap | <input type="text"/> % | | |

Figure 5.3 Production Order: Operation Data

Production Order Change: Component Overview

| | | | |
|----------|-------------|-------|------|
| Order | 1000323 | Type | YBM1 |
| Material | TS422_FG101 | Plant | 1710 |

Component Overview

| Item | Component | Description | Reqmt Qty | U... | I... | Op... | Seq... | Plant | Sto... | Reqr... |
|------|--------------|-----------------------|-----------|------|------|-------|--------|-------|--------|---------|
| 0010 | TS422_SFG101 | TS422_Subassembly-101 | 10 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0020 | TS422_SFG102 | TS422_Subassembly-102 | 10 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0030 | TS422_SFG103 | TS422_Subassembly-103 | 10 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0040 | RM129 | RAW129,PD | 50 | PC | L | 0010 | 0 | 1710 | 171B | |
| 0050 | R-311 | RAW311,PD | 50 | PC | L | 0010 | 0 | 1710 | 171C | |

Production Order Change: Component Overview

| | | | |
|-----------|-------------|----------|------|
| Order | 1000323 | Type | YBM1 |
| Material | TS422_FG101 | Plant | 1710 |
| Operation | 0010 | Sequence | 0 |

General Data Purch. Data V-S Itm Data Co-Product Text Item Long Text

Component

| | | | |
|-----------------------|--------------|-----------------|----------|
| Material | TS422_SFG101 | Search icon | |
| TS422_Subassembly-101 | | | |
| Item | 0010 | Item Cat. | |
| Stor. Loc. | 171B | Status | CRTD |
| Batch | | Item ID | 00000001 |
| Plant | 1710 | Unloading Point | |
| Goods Recipient | | Movement type | 261 |
| Reservation | 7965 | Sort String | |
| Revision Level | | | |
| D/C Indicator | H Credit | | |

Figure 5.4 Production Order: Component Data

Production order Change: Header

| | | | |
|----------|-----------------------------|-------|------|
| Order | 1000323 | Type | YBM1 |
| Material | TS422_FG101 | Plant | 1710 |
| Status | REL MSPT PCNF PRC CSER SETC | | |

Production Order Change: Operation - Details

| | | | | | |
|---------------|-----------------|-----------------|----------|--------------|----------|
| Order | 1000323 | Type | YBM1 | | |
| Material | TS422_FG101 | Plant | 1710 | | |
| Operation | 0010 / | Opr. short text | Assembly | Type | YBM1 |
| Work Center | ASSEMBLY / 1710 | Control Key | YBP1 | Operation ID | 00000010 |
| System Status | PCNF REL | | | Confirmation | 1003 |

Figure 5.5 Production Order: Statuses at Header Level

| Status Management | |
|----------------------|---|
| StatusProfile Header | YBPP0001 PP Order status profile |
| Oprtn status profile | |

| Change Status | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---------------------------|--|--|---|--------|------|-------------------------------------|-----|----------|-------------------------------------|------|-------------------|-------------------------------------|------|---------------------|-------------------------------------|-----|------------|-------------------------------------|------|---------------------------|-------------------------------------|------|-------------------------|
| i | | | | | | | | | | | | | | | | | | | | | | | | | |
| Order | 1000323 | | | | | | | | | | | | | | | | | | | | | | | | |
| Material | TS422_FG101 | | | | | | | | | | | | | | | | | | | | | | | | |
| Type | YBM1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Plant | 1710 | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="radio"/> Status <input type="radio"/> Business processes | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th colspan="3">Syst. Status</th> </tr> <tr> <th>X</th> <th>Sta...</th> <th>Text</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/></td> <td>REL</td> <td>Released</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>MSPT</td> <td>Material shortage</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>PCNF</td> <td>Partially confirmed</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>PRC</td> <td>Pre-costed</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>CSER</td> <td>Error in cost calculation</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>SETC</td> <td>Settlement rule created</td> </tr> </tbody> </table> | | Syst. Status | | | X | Sta... | Text | <input checked="" type="checkbox"/> | REL | Released | <input checked="" type="checkbox"/> | MSPT | Material shortage | <input checked="" type="checkbox"/> | PCNF | Partially confirmed | <input checked="" type="checkbox"/> | PRC | Pre-costed | <input checked="" type="checkbox"/> | CSER | Error in cost calculation | <input checked="" type="checkbox"/> | SETC | Settlement rule created |
| Syst. Status | | | | | | | | | | | | | | | | | | | | | | | | | |
| X | Sta... | Text | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | REL | Released | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | MSPT | Material shortage | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | PCNF | Partially confirmed | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | PRC | Pre-costed | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | CSER | Error in cost calculation | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | SETC | Settlement rule created | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th colspan="3">Status with Status Number</th> </tr> <tr> <th>X</th> <th>Status</th> <th>No.</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | Status with Status Number | | | X | Status | No. | | | | | | | | | | | | | | | | | | |
| Status with Status Number | | | | | | | | | | | | | | | | | | | | | | | | | |
| X | Status | No. | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th colspan="3">Status Without Status No.</th> </tr> <tr> <th>X</th> <th>Status</th> <th>Text</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>1</td> <td>E0001</td> </tr> <tr> <td><input type="checkbox"/></td> <td>2</td> <td>E0002</td> </tr> </tbody> </table> | | Status Without Status No. | | | X | Status | Text | <input type="checkbox"/> | 1 | E0001 | <input type="checkbox"/> | 2 | E0002 | | | | | | | | | | | | |
| Status Without Status No. | | | | | | | | | | | | | | | | | | | | | | | | | |
| X | Status | Text | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | 1 | E0001 | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | 2 | E0002 | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Active Status <input checked="" type="checkbox"/> Change Docs | Status Profile YBPP0001 PP Order status profile | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 5.6 Production Order: System Status and User Status

Extended SPP Work scheduling Plant data / stor. 1 Plant data / stor. 2 Accounting 1 Acc...

| | | |
|----------|-------------------|----------------------------------|
| Material | TS422_FG101 | <input type="button" value="I"/> |
| Descr. | Planning Material | <input type="button" value="G"/> |
| Plant | 1710 Plant 1 US | <input type="button" value="L"/> |

General Data

| | | | | |
|---|--|--|------------------|--------------------------|
| Base Unit of Measure | PC | Piece | Unit of issue | <input type="text"/> |
| Production unit | <input type="text"/> | | P-S matl status | <input type="text"/> |
| Prodn Supervisor | YB1 | MTS DI - Valu... | Prod. Stor.Loc. | 171A |
| Prod. Sched. Profile | YB0001 | MTS DI Valua... | Mat. Grouping | <input type="text"/> |
| Serial No. Profile | YBP1 | SerLevel | Overall profile | <input type="text"/> |
| <input checked="" type="checkbox"/> Version | <input type="checkbox"/> Critical Part | <input type="checkbox"/> Batch entry | Batch mgmt | <input type="checkbox"/> |
| <input type="checkbox"/> ProdVersions | <input type="checkbox"/> Insp.stock | <input type="checkbox"/> Batch rec. req. | Batch mgmt(Plnt) | <input type="checkbox"/> |

Tolerance data

| | | | | | |
|----------------|------------------------------|---------------|------------------------------|-----------|--------------------------|
| Underdely tol. | <input type="text"/> percent | Overdely tol. | <input type="text"/> percent | Unlimited | <input type="checkbox"/> |
|----------------|------------------------------|---------------|------------------------------|-----------|--------------------------|

In-house production time in days

| | | | |
|--------------------|------------------------------------|--------------------------|------------------------|
| Lot size dependent | Interoperation | Lot size independent | |
| Setup time | <input type="text"/> | InhseProdTime | <input type="text"/> 1 |
| Processing time | <input type="text"/> Base quantity | <input type="text"/> 100 | |

Figure 5.7 Material Master: Work Scheduling View

| | |
|--------------------------------|--------------------------|
| Order category | 10 |
| Order Type | YBM1 |
| Short Text | MTS Production Order |
| Control Indicator | |
| CO Partner Update | Semi-active |
| Commitments Mgmt | <input type="checkbox"/> |
| Reorganization | |
| Residence Time 1 | 1 |
| Residence Time 2 | 1 |
| Cost Controlling | |
| Settlement Profile | YBMFP1 |
| Functional Area | YB20 |
| Coll.Order with Goods Movement | <input type="checkbox"/> |
| Status Management | |
| StatusProfile Header | <input type="checkbox"/> |
| Oprtn status profile | <input type="checkbox"/> |
| Number Range General | |

Figure 5.8 Production Order Type

Change View "Order Type-Dependent Parameters: Overview": Details

New Entries

Plant: 1710 Plant 1 US
Order Type: YBM1 MTS Production Order

Planning Implementation Cost Accounting Display Profiles

Master Data

Production Version

Production Version: 1 Manual selection of production version

Routing

Application: P AltTaskListApplic.
Selection ID: Y1
Sequence Exchange: 0 Alternative Sequences
Routing Type: N Routing Check Op. Details Routing Text

Operation

Entry tool
Operation Increment: 0010
Reduction Strategy:

This screenshot shows the SAP Fiori interface for managing order-type-dependent parameters. The title bar indicates the view is "Order Type-Dependent Parameters: Overview". The "Details" section is active. The top navigation bar includes "New Entries" and several standard icons. Below that, specific settings are defined: Plant 1710 (Plant 1 US) and Order Type YBM1 (MTS Production Order). The main content area is divided into tabs: "Planning", "Implementation", "Cost Accounting", and "Display Profiles", with "Planning" currently selected. The "Master Data" section contains three main groups: "Production Version", "Routing", and "Operation". In the "Production Version" group, it's noted that the selection is manual. The "Routing" group includes fields for Application (P), Selection ID (Y1), Sequence Exchange (0), and Routing Type (N). There are also checkboxes for "Alternative Sequences", "Check Op. Details", and "Routing Text". The "Operation" group includes an "Entry tool" checkbox, an "Operation Increment" field set to 0010, and a "Reduction Strategy" field.

Figure 5.9 Order-Type-Dependent Parameters: Planning Tab

| | |
|------------------------------|--|
| Bill of Material | |
| BOM Application | PP01 Production - General |
| BOM Explosion | <input type="button"/> |
| Batch Determination | |
| Search Procedure | YB0001 <input checked="" type="checkbox"/> Check Batch |
| General | |
| Assignment | |
| Substitute MRP Ctrlr | <input type="button"/> |
| Substitute Supervisor | <input type="button"/> |
| Purchase Requisitions | |
| Reservation/Purch.Req. | 3 <input type="checkbox"/> Collective PR |
| Quality Inspection | |
| Inspection Type | <input type="button"/> |

Figure 5.10 Order-Type-Dependent Parameters: Planning Tab (cont.)

Change View "Order Type-Dependent Parameters: Overview": Details

New Entries

Plant: 1710 Plant 1 US
Order Type: YBM1 MTS Production Order

Planning Implementation Cost Accounting Display Profiles

Status Change Documents

- For Order Header
- For Operation
- For Material
- For Production Resource/Tool

Shop Floor Information System

Update **I01**

Release Versions

Header Item Operation

Documentation of Goods Movements

- GR for Purchase Order
- GR for Production Order
- Planned Goods Issue
- Unplanned Goods Issue

PDC

PDC Active Integration MES: C

Workflow

Workflow for Purchase Order Change

Figure 5.11 Order-Type-Dependent Parameters: Implementation Tab

Change View "Order Type-Dependent Parameters: Overview": Details

New Entries

Plant: 1710 Plant 1 US
Order Type: YBM1 MTS Production Order

Planning Implementation Cost Accounting Display Profiles

Cost Accounting

| | | |
|----------------------|---------------------------------------|--|
| Planned Costs Costin | PYG1 Prod. Order Planned | <input type="checkbox"/> Cost Collector |
| Actual Costs Costing | PYG2 Prod. Order Actual | |
| Results Analysis Key | MBMF01 WIP actual cost | |
| Planned Cost Calcul. | 2 Determine Planned Costs When Saving | <input type="checkbox"/> Net Order Price |

Distribution Rule

| | |
|--------------|------------------------------------|
| Default Rule | PP1 Production Mat.Full settlement |
|--------------|------------------------------------|

Figure 5.12 Order-Type-Dependent Parameters: Cost Accounting

Change View "Order Type-Dependent Parameters: Overview": Details

New Entries

Plant 1710 Plant 1 US
Order Type YBM1 MTS Production Order

Planning Implementation Cost Accounting Display Profiles

Collective order display

Graphics Profile 000001 I01

Graphic

Group PP Display orders
Name STANDARD
Index 2

Missing Parts List

ProfMissPrtLstOrdNo 000001 Profile 1 Avail.check for pln/prod.order
Missing Parts Prof. 000002 Profile 2 Avail. check collective order

Figure 5.13 Order-Type-Dependent Parameters: Display Profiles Tab

Change View "Specify scheduling parameters": Details

| | | |
|-------------------|------|----------------------|
| Plant | 1710 | Plant 1 US |
| Order type | YBM1 | MTS Production Order |
| Prod'n Supervisor | * | |

Detailed Scheduling

Scheduling
 Generate Capacity Reqs.

Adjust scheduling

Adjust Dates

Scheduling control for detailed scheduling

| | | |
|-------------------|---------------------------------|--|
| Scheduling Type | 2 Backwards | <input checked="" type="checkbox"/> Automatic Scheduling |
| Start in the Past | <input type="button" value=""/> | <input type="checkbox"/> Automatic log |
| | | <input type="checkbox"/> Scheduling with breaks |
| | | <input type="checkbox"/> From production dates |
| | | <input type="checkbox"/> Shift Order |

Requirements Date Determination for Components

| | | |
|-------------------|-------|--|
| Operation Segment | Setup | <input type="checkbox"/> Latest Staging Date |
|-------------------|-------|--|

Reduction

| | |
|-------------------------|---|
| Reduction type | All operations in the order will be reduced |
| Maximum reduction level | 0 Do not reduce |
| % reduction in floats | I.1 I.2 I.3 I.4 I.5 I.6 |

Figure 5.14 Scheduling Parameters for Production Orders

| Change View "Order control": Details | |
|---|---|
| <input type="button" value="New Entries"/> | <input type="button" value="Print"/> |
| Plant | 1710 Plant 1 US |
| Order Type | YBM1 MTS Production Order |
| Availability Check | <input checked="" type="checkbox"/> 1 Check availability during order creation |
| Material availability | |
| <input type="checkbox"/> No check | |
| <input checked="" type="checkbox"/> Check material availability when saving order | |
| Checking Rule | P2 Production: Order Creation |
| Component Check Type | <input type="checkbox"/> ATP check |
| Collect. conversion | <input checked="" type="checkbox"/> 2 Creation even though no material is available |
| PRT availability | |
| <input checked="" type="checkbox"/> No check | |
| Checking Rule | <input type="checkbox"/> |
| Collect. conversion | <input type="checkbox"/> |
| Capacity availability | |
| <input checked="" type="checkbox"/> No check | |
| Overall profile | <input type="checkbox"/> |
| Collect. conversion | <input type="checkbox"/> |
| Change View "Order control": Details | |
| <input type="button" value="New Entries"/> | <input type="button" value="Print"/> |
| Plant | 1710 Plant 1 US |
| Order Type | YBM1 MTS Production Order |
| Availability Check | <input checked="" type="checkbox"/> 2 Check availability during order release |
| Material availability | |
| <input type="checkbox"/> No check | |
| <input type="checkbox"/> Status check | |
| <input checked="" type="checkbox"/> Check material availability when saving order | |
| Checking Rule | P3 Production: Order Release |
| Component Check Type | <input type="checkbox"/> ATP check |
| Release material | <input checked="" type="checkbox"/> 1 User decides on release if parts are missing |
| PRT availability | |
| <input checked="" type="checkbox"/> No check | |
| Checking Rule | <input type="checkbox"/> |
| PRT release | <input type="checkbox"/> |
| Capacity availability | |
| <input checked="" type="checkbox"/> No check | |
| Overall profile | <input type="checkbox"/> |
| Release Order | <input type="checkbox"/> |
| Batch assignment | |
| Release material | <input type="checkbox"/> |

Figure 5.15 Production Order: Checking Control for Order Creation and Order Release

Change View "Production Scheduling Profile": Details

| | | |
|----------------------|--------|------------------------------|
| Plant | 1710 | Plant 1 US |
| Prod. Sched. Profile | YB0001 | MTS - FG - Pod. Sch. Profile |

Automatic Actions

| | |
|---|--|
| On Creation | On Release |
| <input type="checkbox"/> Release <input type="checkbox"/> Document Links - Material <input type="checkbox"/> Document Links - BOM | <input type="checkbox"/> Execute Printing <input checked="" type="checkbox"/> Schedule Order <input type="checkbox"/> Document Links - Material <input type="checkbox"/> Document Links - BOM <input type="checkbox"/> Create Control Instructions |

Material Availability Check

| | |
|--|--|
| <input type="checkbox"/> Confirm Available Partial Qty | Goods Receipt |
| | <input type="checkbox"/> Automatic Goods Receipt |

Capacity Planning

Leveling

| | |
|-----------------|----------------------|
| Overall Profile | <input type="text"/> |
|-----------------|----------------------|

Availability Check

| | |
|---|--|
| <input type="checkbox"/> Confirm Capacity | <input type="checkbox"/> Finite Scheduling |
|---|--|

Confirmation

| | |
|--|---|
| <input type="checkbox"/> No Update of Excess Receipt | <input type="checkbox"/> No Update of Short Receipt |
| <input type="checkbox"/> Adjust Quantities in Order to Actual Values | |

Figure 5.16 Production Scheduling Profile: Settings

| | | | |
|---|------------------------------------|--|---|
| Batch Management | | | |
| Automatic Batch Creation in the Order | | <input type="checkbox"/> | Date of Manufacture |
| Batch Classification | | <input type="checkbox"/> | Offset in Days <input type="text"/> |
| <input type="checkbox"/> Extended classification <input type="checkbox"/> Always Batch Split | | | |
| Transport | | | |
| <input type="checkbox"/> Complete Transfer Requirement | | <input type="checkbox"/> Confirmed Quantity for TR | |
| WM Request | | <input type="checkbox"/> | No Creation of Transfer Requirements on Order Release |
| <input type="checkbox"/> GI via Delivery <input type="checkbox"/> Kit to Stock in EWM | | | |
| Post Synchronously to Bin | | <input type="checkbox"/> Only Goods Issue <input type="button" value="▼"/> | |
| Order Type | | | |
| Make-to-Stock Production | <input type="radio" value="YBM1"/> | MTS Production Order | |
| Make-to-Order Production | <input type="radio"/> | | |
| Engineer-to-Order Prod | <input type="radio"/> | | |
| Without Material | <input type="radio"/> | | |

Figure 5.17 Production Scheduling Profile: Settings (Cont.)

Collective Conversion of Planned Orders: Initial Screen

The screenshot displays the initial screen for collective conversion of planned orders. It features a header bar with the title "Collective Conversion of Planned Orders: Initial Screen". Below the header is a toolbar with a magnifying glass icon. The main area contains a list of selection fields, each with a dropdown arrow icon. The fields are:

- Planning Plant
- MRP Area
- MRP Controller
- Production Plant
- Prodn. Supervisor
- Material
- Sales Order
- WBS Element
- BOM Explosion number
- Opening Date
- Order Type

Below these fields are two filter sections:

- Select According to Status**:
 - Firmed Planned Orders
 - Planned Orders with Planned Capacity
- Select According to Availability**:
 - Fully Confirmed
 - Partly Confirmed
 - Not Confirmed
 - Not Checked

Figure 5.18 Collective Conversion of Planned Orders

Production Order Create: Initial Screen

| | |
|------------------|----------------------|
| Material | <input type="text"/> |
| Production Plant | <input type="text"/> |
| Planning Plant | <input type="text"/> |
| Order Type | <input type="text"/> |
| Order | <input type="text"/> |

Copy from

| | | |
|-------|----------------------|---|
| Order | <input type="text"/> |  |
|-------|----------------------|---|

Figure 5.19 Production Order Create with Material

Change View "Default values for generation of operations": Details

New Entries

| | | |
|------------------|----------------------|--|
| Plant | 1710 | Plant 1 US |
| Order Type | YBW1 | Rework Prod. Order - Stock Manufac. Item |
| Default Values | | |
| Control Key | YBP1 | |
| Task List Unit | <input type="text"/> | |
| Usage | 1 | Production |
| Denominator | 1 | |
| Numerator | 1 | |
| Base Quantity | 100.000 | |
| Work Center | <input type="text"/> | |
| Operation | 0010 | Rework |
| Purchasing Group | <input type="text"/> | |
| Material Group | <input type="text"/> | |

Figure 5.20 Default Values for Generation of Operation

SAP Production order Create: Header

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|-----------------------------|----------|----------------------------|---|------------|----------------|-----------|--------------------|--|--|---------------|--------------------|------------------|-------------|-----------------|----------------|------------|------------|----------------------|--|-------------------|-------|------------|-------|----------------------------|--|----------|------------|--|--|------------|--|
| Schedule Order | Cost Order | Create Control Instructions | Material | Capacity | Operations | Components | Documents | Sequences | Stock/Requirements | | | | | | | | | | | | | | | | | | | | | | | | |
| Order: %0000000001 <input type="button" value=""/> | | | | | Type: YBM1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Material: TS422_FG101 | | | | | Finished Material-TS422_FG101 | | Plant: 1710 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Status: REL MSPT SETC <input type="button" value=""/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>General</td> <td>Assignment</td> <td>Goods Receipt</td> <td>Control</td> <td>Dates/Quantities</td> <td>Master Data</td> <td>Long Text</td> <td>Administration</td> <td>Items</td> <td>Fast Entry</td> </tr> </table> | | | | | | | | | | General | Assignment | Goods Receipt | Control | Dates/Quantities | Master Data | Long Text | Administration | Items | Fast Entry | | | | | | | | | | | | | | |
| General | Assignment | Goods Receipt | Control | Dates/Quantities | Master Data | Long Text | Administration | Items | Fast Entry | | | | | | | | | | | | | | | | | | | | | | | | |
| Quantities <table border="1"> <tr> <td>* Total Qty: 100 <input type="button" value="PC"/></td> <td>Scrap Portion: <input type="text"/> 0.00 %</td> </tr> <tr> <td>Delivered: 0</td> <td>Short/Exc. Rcpt: 0</td> </tr> </table> | | | | | | | | | | * Total Qty: 100 <input type="button" value="PC"/> | Scrap Portion: <input type="text"/> 0.00 % | Delivered: 0 | Short/Exc. Rcpt: 0 | | | | | | | | | | | | | | | | | | | | |
| * Total Qty: 100 <input type="button" value="PC"/> | Scrap Portion: <input type="text"/> 0.00 % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Delivered: 0 | Short/Exc. Rcpt: 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dates/Times <table border="1"> <tr> <td colspan="2">Basic Dates</td> <td colspan="2">Scheduled</td> <td colspan="2">Confirmed</td> </tr> <tr> <td>End: 24.12.2021</td> <td>00:00</td> <td>23.12.2021</td> <td>16:00</td> <td colspan="2"><input type="text"/></td> </tr> <tr> <td>Start: 23.12.2021</td> <td>00:00</td> <td>23.12.2021</td> <td>07:56</td> <td colspan="2"><input type="text"/> 00:00</td> </tr> <tr> <td>Release:</td> <td>23.12.2021</td> <td colspan="2"></td> <td colspan="2">21.11.2021</td> </tr> </table> | | | | | | | | | | Basic Dates | | Scheduled | | Confirmed | | End: 24.12.2021 | 00:00 | 23.12.2021 | 16:00 | <input type="text"/> | | Start: 23.12.2021 | 00:00 | 23.12.2021 | 07:56 | <input type="text"/> 00:00 | | Release: | 23.12.2021 | | | 21.11.2021 | |
| Basic Dates | | Scheduled | | Confirmed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| End: 24.12.2021 | 00:00 | 23.12.2021 | 16:00 | <input type="text"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Start: 23.12.2021 | 00:00 | 23.12.2021 | 07:56 | <input type="text"/> 00:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Release: | 23.12.2021 | | | 21.11.2021 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Scheduling * Type: 2 Backwards <input type="button" value=""/> Reduction: No reduction carried out Note: No scheduling note Priority: <input type="checkbox"/> | | | | | Floats Sched. Margin Key: 000 Float Bef. Prdn: <input type="checkbox"/> Workdays Float After Prdn: <input type="checkbox"/> Workdays Release Period: <input type="checkbox"/> Workdays | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 5.21 Production Order Dates at the Header Level

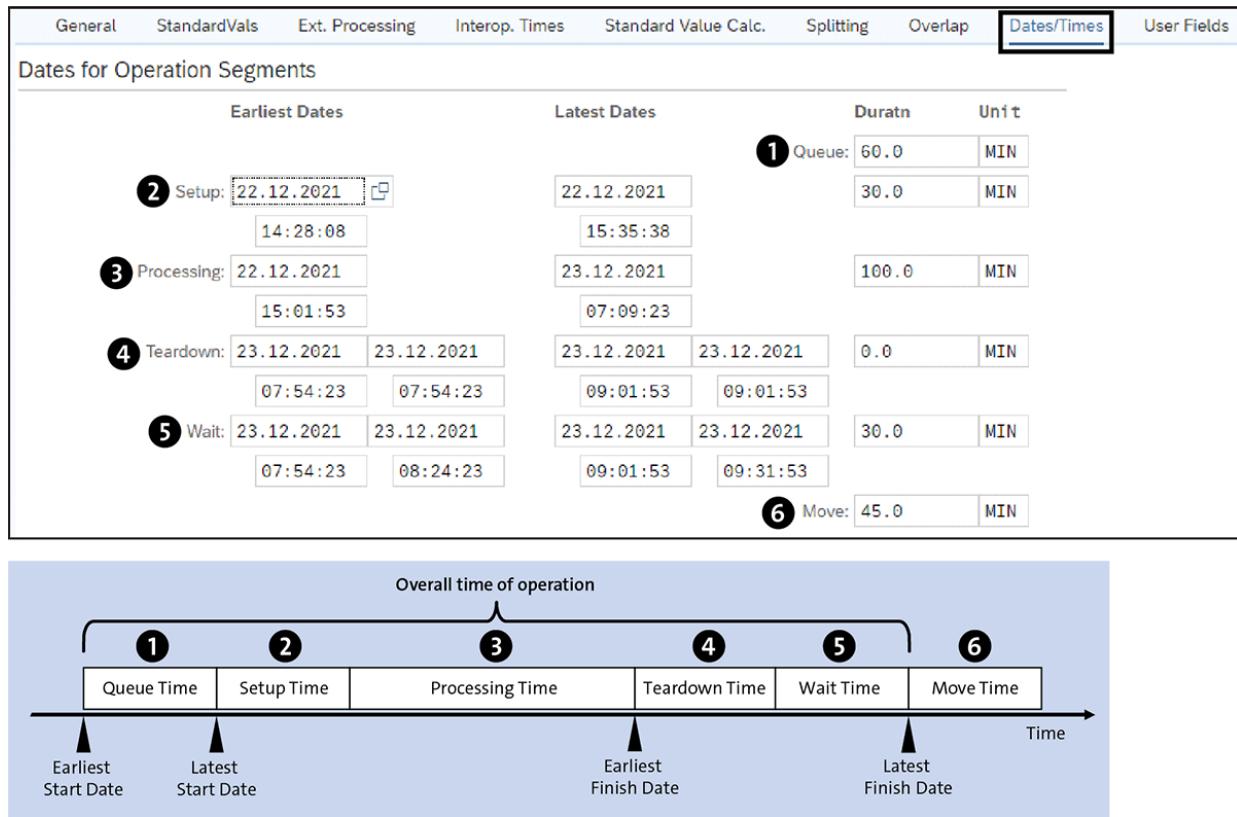


Figure 5.22 Dates and Times in the Operation Details Screen

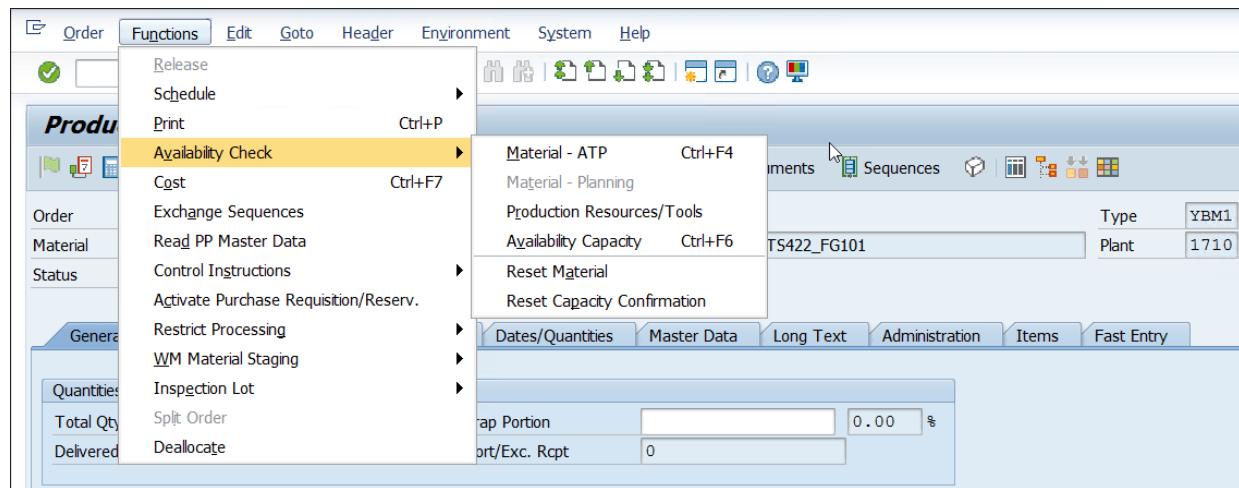


Figure 5.23 Production Order Availability Check

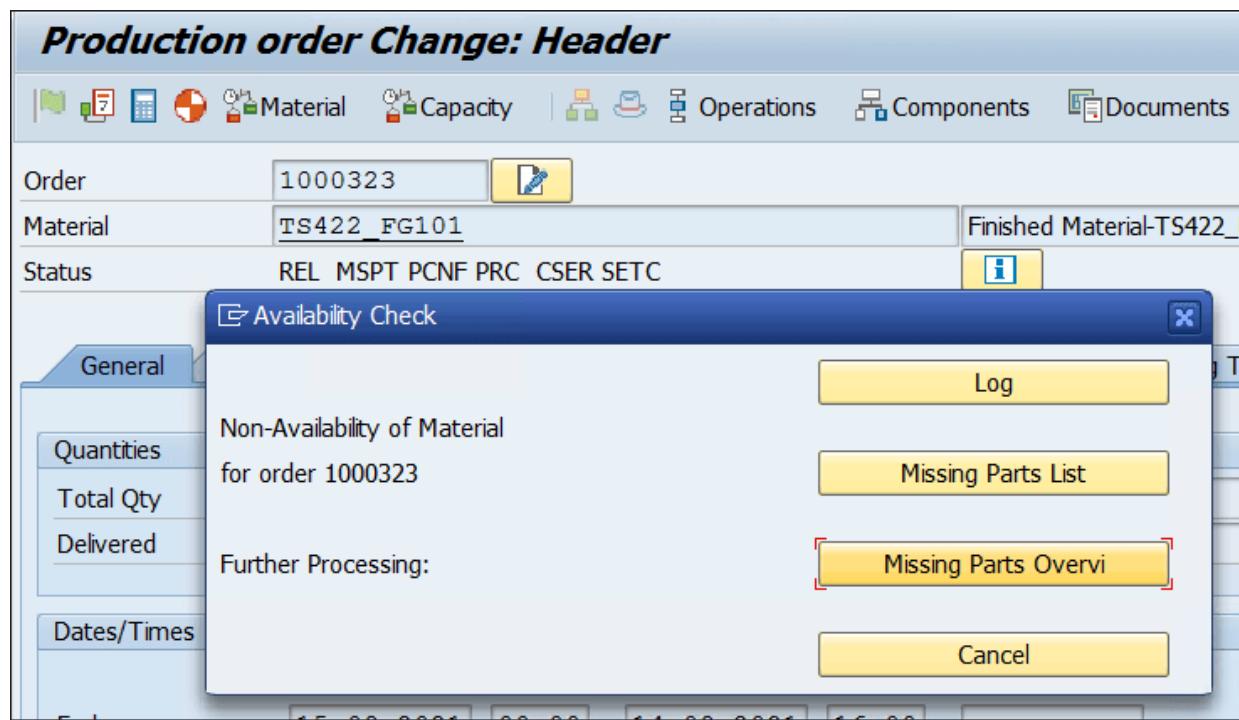


Figure 5.24 Production Order: Material Availability

Production order Change: Header

| | | | | |
|----------|-------------------------|-------------------------------|-------|------|
| Order | 1000348 | | Type | YBM1 |
| Material | TS422_FG101 | Finished Material-TS422_FG101 | Plant | 1710 |
| Status | CRTD MSPT PRC CSER SETC | | | |

Production order Change: Header

| | | | | |
|----------|------------------------|-------------------------------|-------|------|
| Order | 1000348 | | Type | YBM1 |
| Material | TS422_FG101 | Finished Material-TS422_FG101 | Plant | 1710 |
| Status | REL MSPT PRC CSER SETC | | | |

Figure 5.25 Release of Production Order

Release Production Orders

List: PPIOH000 Order Headers

Layout: 000000000001 Standard Layout

Selection Mass Processing - Release

Select. at Header Level

| | | | |
|--------------------------|---|--------------------------------|--|
| Production Order | <input type="text"/> | to <input type="text"/> | |
| Material | <input type="text"/> | to <input type="text"/> | |
| Production Plant | <input type="text"/> | to <input type="text"/> | |
| Planning Plant | <input type="text"/> | to <input type="text"/> | |
| Order Type | <input type="text"/> | to <input type="text"/> | |
| MRP Controller | <input type="text"/> | to <input type="text"/> | |
| Production Supervisor | <input type="text"/> | to <input type="text"/> | |
| Production Version | <input type="text"/> | to <input type="text"/> | |
| Sold-To Party | <input type="text"/> | to <input type="text"/> | |
| Sales Order | <input type="text"/> | to <input type="text"/> | |
| Sales Order Item | <input type="text"/> | to <input type="text"/> | |
| WBS Element | <input type="text"/> | to <input type="text"/> | |
| Sequence Number | <input type="text"/> | to <input type="text"/> | |
| Priority | <input type="text"/> | to <input type="text"/> | |
| Status Selection Profile | <input type="text"/> | and <input type="text"/> | |
| System Status | <input type="text"/> Excl. <input type="checkbox"/> | Excl. <input type="checkbox"/> | |
| Stock Segment | <input type="text"/> | to <input type="text"/> | |

Figure 5.26 Collective Release of Production Orders:
Selection Screen

| Change View "Names of lists": Overview | |
|---|---------------------|
| New Entries | |
| Dialog Structure | |
| Names of lists <ul style="list-style-type: none"> Spool parameters for user Reference order types <ul style="list-style-type: none"> Forms Print programs List control for transactions Printer specification Flow control for transactions Table accesses | |
| Name of the Lists | |
| List | List Name |
| LF01 | PRT overview |
| LG01 | Object list |
| LG02 | Op. control ticket |
| LG03 | Job Ticket |
| LG04 | Kanban ticket |
| LK01 | Pick list |
| LK02 | Goods issue slip |
| LK03 | Goods receipt list |
| LP01 | |
| LP02 | |
| LV01 | Time ticket |
| LV02 | Confirmation slip |
| LV03 | Document links |
| LV04 | Operation Splitting |

Figure 5.27 Define Print Control

Goods Issue Order 1000323 - Siva Kumar Mutnuru

Show Overview | Hold | Check | Post | Help

A07 Goods Issue | R08 Order | 1000323 | GI for order | 261

General

| Line | Mat. Short Text | W | OK | Qty in UnE | EUn | SLoc | Order | Acti... | Co... | Stock Segment | Batch | Valuation Type | M... | D... | St... |
|------|-----------------------|---|----|------------|-----|----------------|---------|---------|-------|---------------|-------|----------------|------|------|-------|
| 1 | TS422_Subassembly-101 | | | 10 | PC | Std. storage 2 | 1000323 | 0010 | 1710 | | | | 261 | - | t |
| 2 | TS422_Subassembly-102 | | | 10 | PC | Std. storage 2 | 1000323 | 0010 | 1710 | | | | 261 | - | t |
| 3 | TS422_Subassembly-103 | | | 10 | PC | Std. storage 2 | 1000323 | 0010 | 1710 | | | | 261 | - | t |

Document Date: 22.09.2021 | Material Slip: | Doc.Header Text: |

Posting Date: 22.09.2021 |

1 Individual Slip

Buttons: Save, Print, Delete, Contents, Undo, Redo, Refresh

Figure 5.28 GI to Production Order with Transaction MIGO

Picking List: Initial Screen

Profile
Profile 000002 Standard pick profile

Selection at Header Level

| | | | | |
|-----------------------|---------|----|--|--|
| Production order | 1000323 | to | | |
| Material | | to | | |
| Plant | 1710 | to | | |
| Order type | | to | | |
| MRP controller | | to | | |
| Production Supervisor | | to | | |
| Sold-To Party | | to | | |

Order Information System: Detail List of Components

Order | Material | Reqmts date | SLoc | Batch | Requirement quantity | Quantity withdrawn | BU

| | | | | | | | |
|---------|--------------|------------|------|--|----|---|----|
| 1000323 | R-311 | 14.09.2021 | 171C | | 50 | 0 | PC |
| 1000323 | RM129 | | 171B | | 50 | 0 | PC |
| 1000323 | TS422_SFG101 | | | | 10 | 0 | PC |
| 1000323 | TS422_SFG102 | | | | 10 | 0 | PC |
| 1000323 | TS422_SFG103 | | | | 10 | 0 | PC |

Picking list

Batch Determination | Stock Determination | Entry | 1/ 5(5)

Goods Movements Overview

| Material | Quantity | U... | Plant | Sto... | Reqmnt Segment | Stock Segment | Batch | Valuation Type | D... | M... | Order | S.. | Supplier |
|--------------|----------|------|-------|--------|----------------|---------------|-------|----------------|------|---------|-------|-----|----------|
| TS422_SFG101 | 10 | PC | 1710 | 171B | | | | H | 261 | 1000323 | | | |
| TS422_SFG102 | 10 | PC | 1710 | 171B | | | | H | 261 | 1000323 | | | |
| TS422_SFG103 | 10 | PC | 1710 | 171B | | | | H | 261 | 1000323 | | | |
| R-311 | 50 | PC | 1710 | 171C | | | | H | 261 | 1000323 | | | |
| RM129 | 50 | PC | 1710 | 171B | | | | H | 261 | 1000323 | | | |

Figure 5.29 Pick List: Transaction CO27

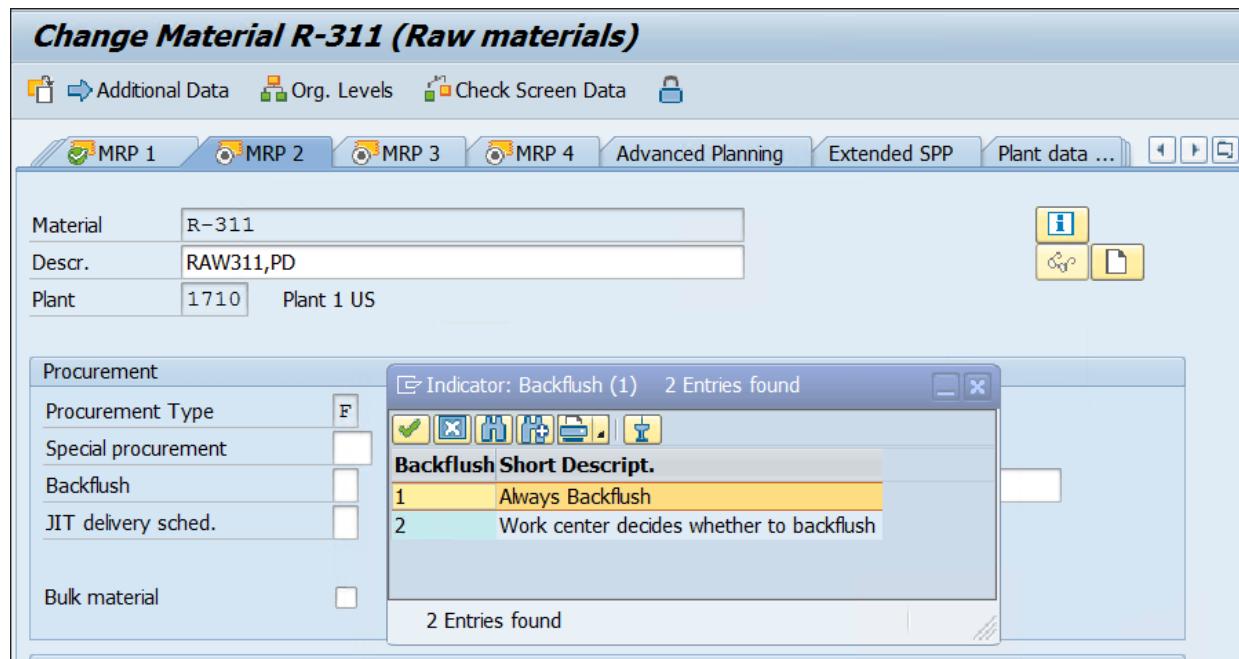


Figure 5.30 Backflush Field: Material Master

| General Data | | |
|----------------------|-------------------------------------|--|
| Work Center Category | 0001 | Machine |
| Person Responsible | 001 | Work center supervisor |
| Location | | |
| QDR System | | |
| Supply Area | | |
| Usage | 009 | All task list types |
| Backflush | <input checked="" type="checkbox"/> | Advanced Planning <input type="checkbox"/> |

Figure 5.31 Backflush Indicator: Work Center

| Production Order Change: Component Overview | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---------------------|-----------------------|-----------|----------|------|-------------------------------|--------|------------|--------|-------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | Material | | Capacity | | Operations | | Components | | Documents | | | | | | | | | | | | | | | |
| Order | | 1000323 | | | | | | | | | | | | | | | | | | | | | | | |
| Material | | <u>TS422_FG101</u> | | | | Finished Material-TS422_FG101 | | | | | | | | | | | | | | | | | | | |
| Component | | | | | | | | | | | | | | | | | | | | | | | | | |
| Component Overview | | | | | | | | | | | | | | | | | | | | | | | | | |
| Item | Component | Description | Reqmt Qty | U... | I... | Op... | Seq... | Plant | Sto... | Backflush | | | | | | | | | | | | | | | |
| 0010 | <u>TS422_SFG101</u> | TS422_Subassembly-101 | 10 | PC | L | 0010 | 0 | 1710 | 171B | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | |
| 0020 | <u>TS422_SFG102</u> | TS422_Subassembly-102 | 10 | PC | L | 0010 | 0 | 1710 | 171B | <input type="checkbox"/> | | | | | | | | | | | | | | | |
| 0030 | <u>TS422_SFG103</u> | TS422_Subassembly-103 | 10 | PC | L | 0010 | 0 | 1710 | 171B | <input type="checkbox"/> | | | | | | | | | | | | | | | |

Figure 5.32 Backflush Indicator: Production Order Change Component Overview

Enter Time Ticket for Production Order

Goods Movements | Actual Data

| | | | | | |
|-------------------------------|----------------------|--|---------|----------|-------------|
| Confirmation | 1017 | Order | 1000348 | Material | TS422_FG101 |
| Finished Material-TS422_FG101 | | | | | |
| Operation | 0010 | Sequence | 0 | Assembly | |
| Work Center | ASSEMBLY | Plant | 1710 | Assembly | |
| Confirm.type | Partial confirmation | <input type="checkbox"/> Clear open reservations | | | |

Quantities

| | To Be Confirmed | Unit |
|-----------------|-----------------|------|
| Yield | 10 | PC |
| Scrap | | |
| Rework | | |
| Reason for Var. | | |

Activities

| | To Be Confirmed | Unit | Finished |
|------------|-----------------|------|--------------------------|
| Setup | 30 | MIN | <input type="checkbox"/> |
| Machine | 10 | MIN | <input type="checkbox"/> |
| Labor | 10 | MIN | <input type="checkbox"/> |
| Activity 4 | | | <input type="checkbox"/> |
| Activity 5 | | | <input type="checkbox"/> |
| Activity 6 | | | <input type="checkbox"/> |

Personnel

| | | | |
|---------------|--|---------|--|
| Personnel No. | | Time ID | |
|---------------|--|---------|--|

Figure 5.33 Time Ticket Confirmation for Production Order Operation (Transaction CO11N)

Change View "Single Screen Entry of Confirmations": Details

New Entries

Profile: SAP001 Postprocessing

Description: Conf. profile for single screen entry

Standard Prof. Detail Areas Preview

Use Profile for Plant/Order Type Alternative Profile: []

Area Selection **Default**

Header area: 0113 Confirmation/order/sequence/operation/work center

Detail areas

| Area | Pushbutton Text | Closed |
|--|-----------------|--------------------------|
| 0200 Quantities: yield/scrap/rework/reason | Quantities | <input type="checkbox"/> |
| 0300 Activities: activity 1 - activity 6 | Activities | <input type="checkbox"/> |
| 0410 Personnel: incl. work center, wage group, ... | Personnel | <input type="checkbox"/> |
| 0500 Dates: execution and forecast | Dates | <input type="checkbox"/> |
| 0600 Additional data: posting date and break time | Supplement | <input type="checkbox"/> |
| 0800 Confirmation Text | Text | <input type="checkbox"/> |
| | | <input type="checkbox"/> |

Figure 5.34 Confirmation Profile: Area Selection

Change View "Single Screen Entry of Confirmations": Details

Profile SAP001
 Description Conf. profile for single screen entry

Standard Prof.

Use Profile for Plant/Order Type Alternative Profile

Area Selection Default

| Confirmation function | | | |
|--------------------------|---|---|--------------------------|
| Confirm.Type | <input type="text" value="Partial confirmation"/> <input type="checkbox"/> Clear Open Reservs. | | |
| Default value | | | |
| Quants | <input type="text" value="No proposal"/> | | |
| Services | <input type="text" value="No proposal"/> | | |
| Shift | <input type="text"/> <input type="checkbox"/> Shift Grouping | | |
| Dates | <input type="text" value="No proposal"/> | | |
| Sudvision of Quantities | | | |
| Qty Layout | <input type="text"/> <input type="checkbox"/> Fixed Layout | | |
| Customer-Specific Fields | | | |
| Show | <input type="text"/> | | |
| Services | | | |
| | Hidden | Text | Fixed Desc |
| Service 1 | <input type="checkbox"/> | <input type="text" value="Activity 1"/> | <input type="checkbox"/> |
| Service 2 | <input type="checkbox"/> | <input type="text" value="Activity 2"/> | <input type="checkbox"/> |

Figure 5.35 Confirmation Profile: Default

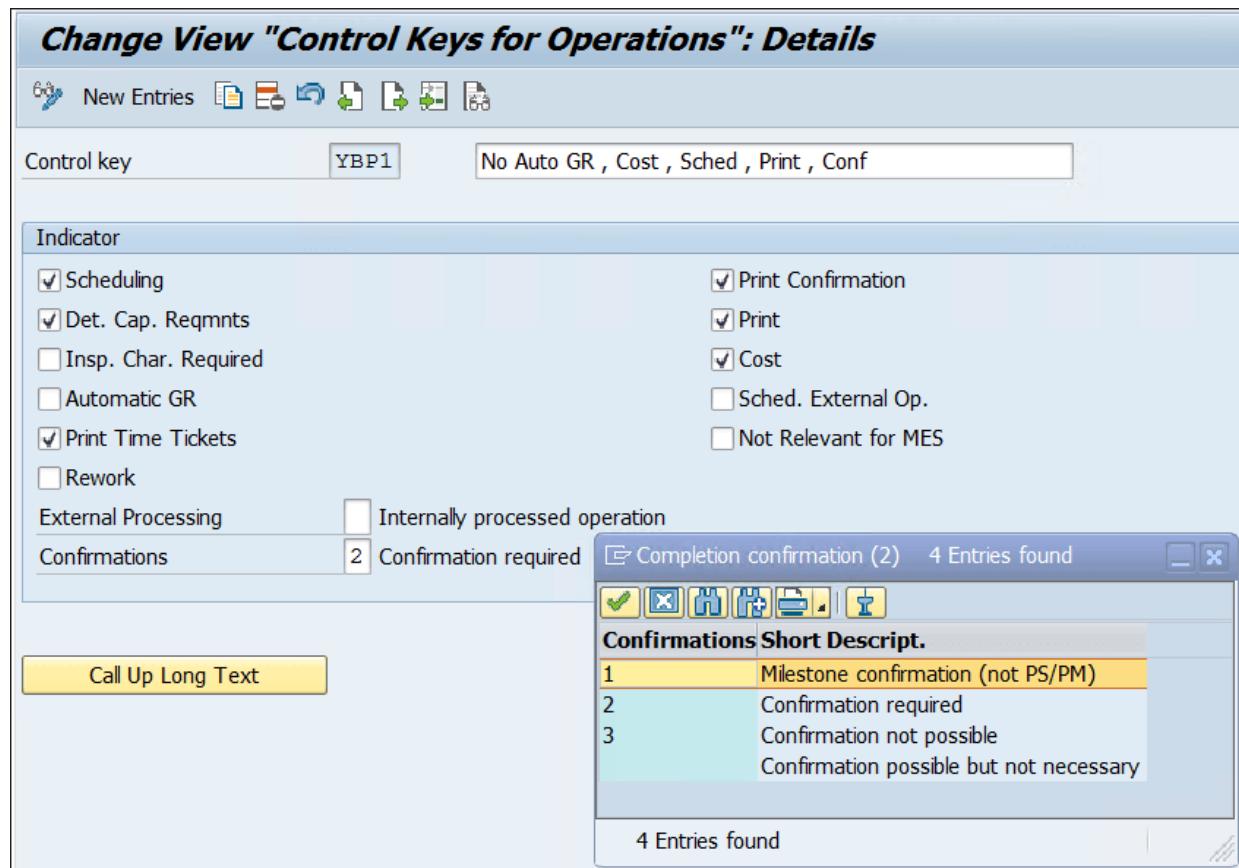


Figure 5.36 Operation Control Key: Confirmation-Related Settings

Change Work Center: Capacity Overview

HR assignment Template

| | | |
|-------------|----------|------------|
| Plant | 1710 | Plant 1 US |
| Work center | ASSEMBLY | Assembly |

Basic Data Default Values Capabilities Scheduling Costing Technology Groups

Overview

| Capacity category | 001 | Machine | Control Capacity Reduction |
|--------------------|--------|--------------------|---------------------------------------|
| Pooled capacity | | Vorschlagkapazität | 0 Formula-Related |
| Setup Formula | SAP005 | Prod: Setup rqmts | 0 Formula-Related |
| Processing Formula | SAP006 | Prod.: Machine rqm | 0 Formula-Related |
| Teardown Formula | | | 0 Formula-Related |
| Other Formula | | | 1 Completely for Partial Confirmation |
| Distribution | | | 2 Completely for Final Confirmation |
| Int. dist. key | | | 3 Proportional to Service |

Figure 5.37 Capacity Reduction with Confirmation:
Settings in Work Center

Confirmation of Production Order Enter : Actual Data

| | | | |
|--------------------------|--|---------------------|---------------------------------|
| Order | 1000348 | Status | REL MSPT PRC CSER SETC |
| Material | TS422_FG101 | | |
| Material Descr. | Finished Material-TS422_FG101 | | |
| Confirmation Type | | | |
| Partial confirmation | <input checked="" type="radio"/> | Clear Open Reservs. | <input type="checkbox"/> |
| Final Confirmation | <input type="radio"/> | | |
| Autom. Final Conf. | <input type="radio"/> | | |
| Actual Data | | | |
| Yield Quantity | Curr. t/b Conf. 10 | Unit PC | Confirmed to Date 0 |
| Scrap Quantity | | | Planned t/b Conf. 10 PC |
| Rework Quantity | | | 0 |
| Reason for Var. | | | |
| Personnel no. | | | |
| Start Execution | To Be Confirmed 24.09.2021 00:34:10 | Confirmed to Date | Planned t/b Conf. 28.09.2021 |
| Finish Execut. | 24.09.2021 00:34:10 | | 28.09.2021 |
| Posting Date | 24.09.2021 | | |
| Confirm. Text | Long Text exists | | <input type="checkbox"/> |

Figure 5.38 Confirmation: For Order (Transaction CO15)

| Display Production Order Confirmation: Operation Overview | | | | | | | | | | |
|---|-------------------------------|----------|-------|------|-----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------|
| | | | | | | | | | | |
| Order | 1000348 | | | | | | | | | |
| Material | TS422_FG101 | | | | | | | | | |
| Material Descr. | Finished Material-TS422_FG101 | | | | | | | | | |
| System Status | REL MSPT PCNF PRC CSER SETC | | | | | | | | | |
| | | | | | | | | | | |
| Operation/Counter | M. | Quantity | Scrap | U... | OprShrtTxt | C | .. | R. | F. | Typ... |
| - 0010 | <input type="checkbox"/> | 10 | 0 | PC | Assembly | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1 |
| · 1 | <input type="checkbox"/> | 5 | 0 | PC | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1 |
| - 0020 | <input type="checkbox"/> | 10 | 0 | PC | Final Acceptance | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1 |
| · 1 | <input type="checkbox"/> | 5 | 0 | PC | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1 |
| - 0030 | <input type="checkbox"/> | 10 | 0 | PC | Packaging | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1 |
| · 1 | <input type="checkbox"/> | 5 | 0 | PC | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1 |
| - 0040 | <input type="checkbox"/> | 10 | 0 | PC | Posting GR (with opt. Se... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

Figure 5.39 Display Confirmations

Change View "Control Keys for Operations": Details

New Entries

| | | |
|--|---|-------------------------------|
| Control key | YB03 | Auto Gr,Cost,Print,Sched,Conf |
| Indicator | | |
| <input checked="" type="checkbox"/> Scheduling | <input checked="" type="checkbox"/> Print Confirmation | |
| <input checked="" type="checkbox"/> Det. Cap. Reqmts | <input checked="" type="checkbox"/> Print | |
| <input type="checkbox"/> Insp. Char. Required | <input checked="" type="checkbox"/> Cost | |
| <input checked="" type="checkbox"/> Automatic GR | <input type="checkbox"/> Sched. External Op. | |
| <input type="checkbox"/> Print Time Tickets | <input type="checkbox"/> Not Relevant for MES | |
| <input type="checkbox"/> Rework | | |
| External Processing | <input type="checkbox"/> Internally processed operation | |
| Confirmations | 2 Confirmation required | |
| Call Up Long Text | | |

Change View "Production Scheduling Profile": Details

New Entries

| | | |
|--|--|---|
| Plant | 1710 | Plant 1 US |
| Prod. Sched. Profile | YB0001 | MTS - FG - Pod. Sch. Profile |
| Automatic Actions | | |
| On Creation | | On Release |
| <input type="checkbox"/> Release | <input type="checkbox"/> Execute Printing | |
| <input type="checkbox"/> Document Links - Material | <input checked="" type="checkbox"/> Schedule Order | |
| <input type="checkbox"/> Document Links - BOM | <input type="checkbox"/> Document Links - Material | |
| | <input type="checkbox"/> Document Links - BOM | |
| | <input type="checkbox"/> Create Control Instructions | |
| Material Availability Check | | Goods Receipt |
| <input type="checkbox"/> Confirm Available Partial Qty | | <input checked="" type="checkbox"/> Automatic Goods Receipt |

Figure 5.40 Automatic GR Settings

Production order Change: Header

The screenshot shows the SAP Production Order Change: Header interface. The top navigation bar includes links for Material, Capacity, Operations, Components, Documents, Sequences, and various reports. The main header section displays the Order number (1000348), Material (TS422_FG101), Status (REL MSPT PCNF PRC CSER SETC), Type (YBM1), and Plant (1710). Below the header, a tab bar is visible with General, Assignment, Goods Receipt (selected), Control, Dates/Quantities, Master Data, Long Text, Administration, Items, and Fast Entry.

Control

| | | | |
|---------------|----------------------|--------------------|-------------------------------------|
| Stock Type | Unrestricted use | Goods Receipt | <input checked="" type="checkbox"/> |
| GR Proc. Time | Unrestricted use | GR Non-Valuated | <input type="checkbox"/> |
| | X Quality inspection | Delivery Completed | <input type="checkbox"/> |
| | S Blocked stock | | |

Tolerances

| | | | | | |
|---------------|---|--------------|---|------------------------|--------------------------|
| Underdelivery | % | Overdelivery | % | Unlimited Overdelivery | <input type="checkbox"/> |
|---------------|---|--------------|---|------------------------|--------------------------|

Receipt

| | | | |
|--------------|----------------------|----------|---|
| Stor. Loc. | 171A | Batch | <input type="text"/> <input type="button" value="..."/> |
| Distribution | <input type="text"/> | Stk Seg. | <input type="text"/> |

Inbound Delivery

| | |
|-----------------|----------------------|
| Goods Recipient | <input type="text"/> |
| Unloading Point | <input type="text"/> |

Figure 5.41 Production Order: GR Information

Maintain Settlement Rule: Overview

Order Finished Material-TS422_FG101

Actual settlement

| Distribution rules | | | | | | | | |
|--------------------|---------------------|-------------------------------|--------|-----------------|--------|------|-----|--|
| Cat | Settlement Receiver | Receiver Short Text | % | Equivalence No. | Set... | S... | No. | |
| MAT | TS422_FG101 | Finished Material-TS422_FG101 | 100.00 | | FUL | | 1 | |
| | | | | | | | | |

Figure 5.42 Production Order: Settlement Rule

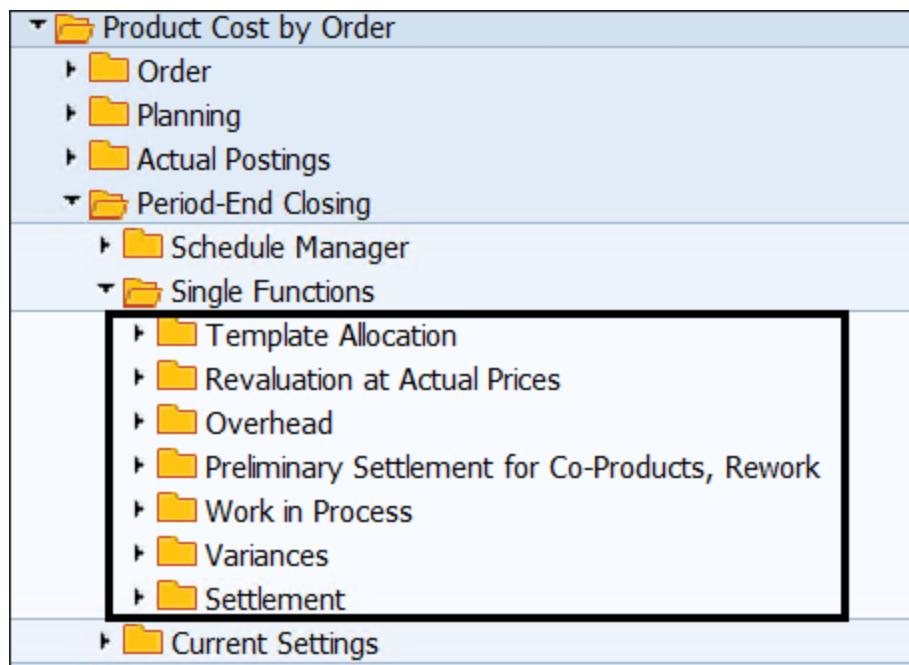


Figure 5.43 Steps in Final Costing for the Production Order

| Postprocessing of Error Records from Automatic Goods Movements | | | | | | | | | | | | | | | | | |
|--|--------|----------------|-----------------------|---------|------|--------|-----|----------------|-----|--------------------|------|------------|------------|----------|-------------|------|-------|
| | | Change details | | Refresh | | Delete | | Display errors | | Individual Records | | Stock | | Material | | | |
| | | | | | | | | | | | | | | | | | |
| 21.11.2021 Goods Movements with Errors: Summarized Records | | | | | | | | | | | | | | | | | |
| | Status | Material | Description | PInt | SLoc | Batch | MvT | Qty in UnE | EUn | AppAr | Msg. | Created | Error Date | Coun... | Qty in PUoM | EUoM | PU... |
| <input type="checkbox"/> | ◆ | RM129 | RAW129.PD | 1710 | 171B | | 261 | 5,000 | PC | M7 | 021 | 21.11.2021 | 21.11.2021 | 1 | | | |
| <input type="checkbox"/> | ◆ | TS422_SFG101 | TS422_Subassembly-101 | 1710 | 171B | | 261 | 1,000 | PC | M7 | 021 | 21.11.2021 | 21.11.2021 | 1 | | | |
| <input type="checkbox"/> | ◆ | TS422_SFG102 | TS422_Subassembly-102 | 1710 | 171B | | 261 | 1,000 | PC | M7 | 021 | 21.11.2021 | 21.11.2021 | 1 | | | |
| <input type="checkbox"/> | ◆ | TS422_SFG103 | TS422_Subassembly-103 | 1710 | 171B | | 261 | 1,000 | PC | M7 | 021 | 21.11.2021 | 21.11.2021 | 1 | | | |
| <input type="checkbox"/> | ◆ | R-311 | RAW311.PD | 1710 | 171C | | 261 | 5,000 | PC | M7 | 021 | 21.11.2021 | 21.11.2021 | 1 | | | |

Figure 5.44 Postprocessing of Error Records from Automatic Goods Movements

The screenshot displays two views of the SAP Manage Production Orders application. The top view is a search interface for 'Standard *' orders, showing filters for Status (Delivered), Issue Type (No Filter), Delay Duration (>= 0 Hours), Order (TS422*), Material (TS422*), Scheduled Start, and Production Plant (=1710). It lists two orders: 1000444 and 1000121. Order 1000444 is highlighted with a blue border. An arrow points from this order to the second view below.

The bottom view is a detailed page for Order 1000444. It includes tabs for Issues, Order Information, Components, Order Schedule, Confirmation, and Inspection. The Components tab shows a table for material RM129 (RAW129,PD) with a total quantity of 5000 PC. A coverage overview dialog is open, showing the following data:

| Coverage Overview | | Component Scrap | Requirement Date/Time | Storage Location |
|--------------------------|----------|-----------------|-------------------------|------------------|
| Consumed: | 0 PC | | | |
| Committed - On Hand: | 0 PC | 0.00 % | Sun, Nov 21, 2021 07:00 | 171B |
| Committed - Not on Hand: | 0 PC | | | |
| Uncovered: | 5,000 PC | | | |

The Order Schedule tab lists four operations: 0010 Assembly, 0020 Final Acceptance, 0030 Packaging, and 0040 Posting GR (with opt. SerialNo assignm.). The Confirmation tab shows Order Confirmations.

Figure 5.45 Manage Production Orders App

SAP Manage Production Operations

Standard * ▾

Status: Issue Type: Delay Duration: Relevant for Confirmations: Sequence Category: Material: Production Plant:

Search Delivered 6 More ▾ >= 0 Hours Yes Standard Sequ... TS422* ▾ Plant 1 US (1710) Go Adapt Filters (6)

Operations (9) Release Operations

| Order | Material | Work Center | Operation/Progress | Status | Start | End | Issues |
|---------|--|--------------------|--|-----------|----------------------------|----------------------------|--|
| 1000444 | TS422_FG101 Finished Material-TS422_FG101 | TESTING Testing | Posting GR (with opt. SerialNo assignm.) (0040) 950 of 1000 | Confirmed | Mon, Nov 22, 2021 11:09 | Mon, Nov 22, 2021 11:09 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 <span |

Figure 5.46 Manage Production Orders App

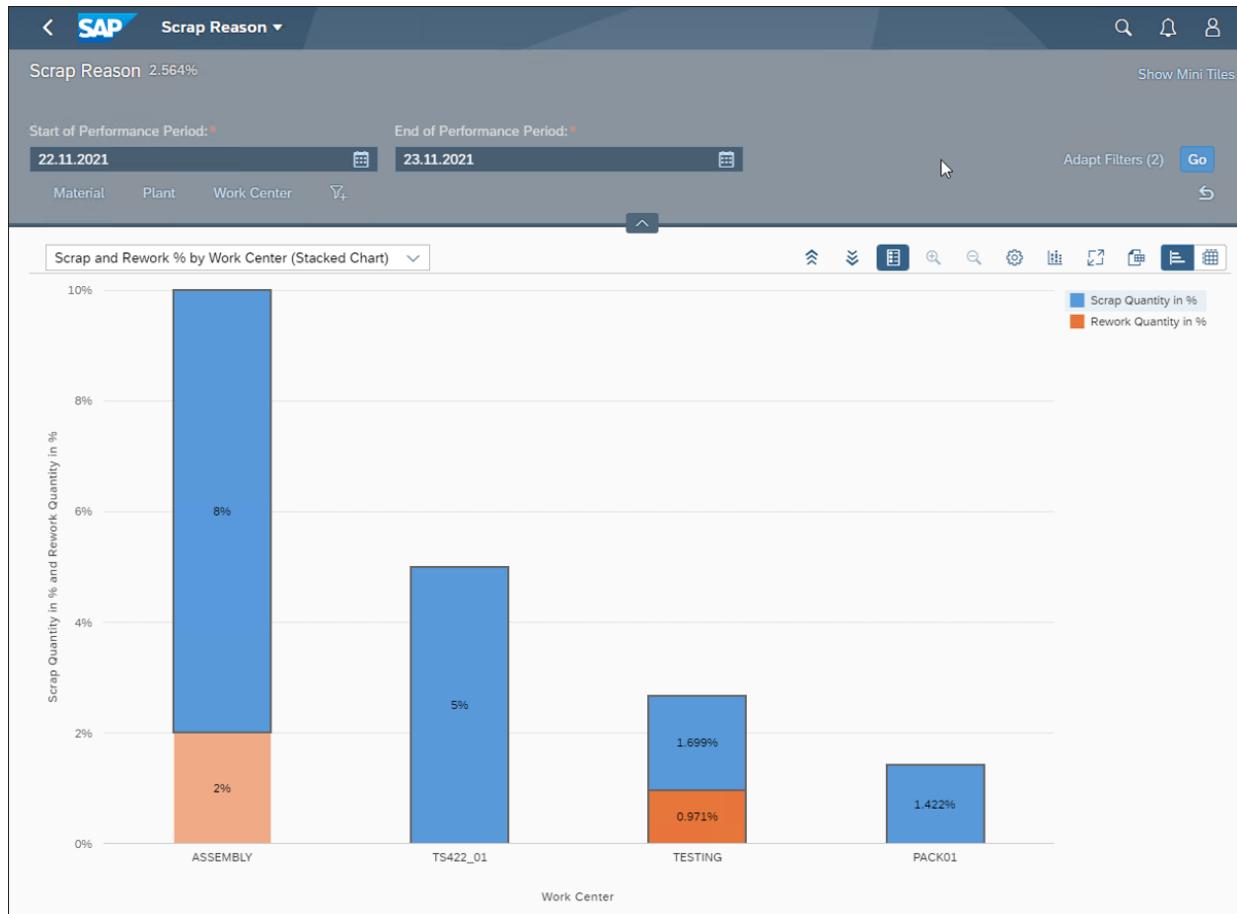


Figure 5.47 Scrap Reason App

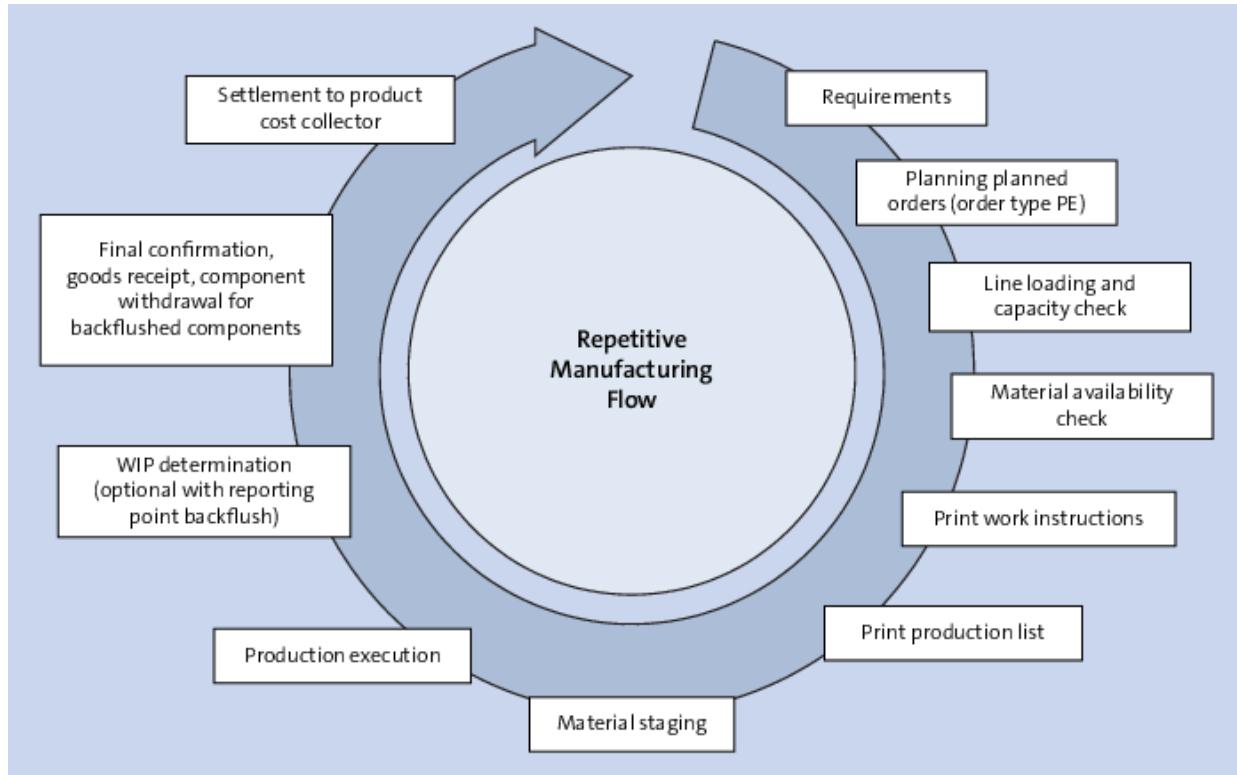


Figure 6.1 Repetitive Manufacturing Process Flow

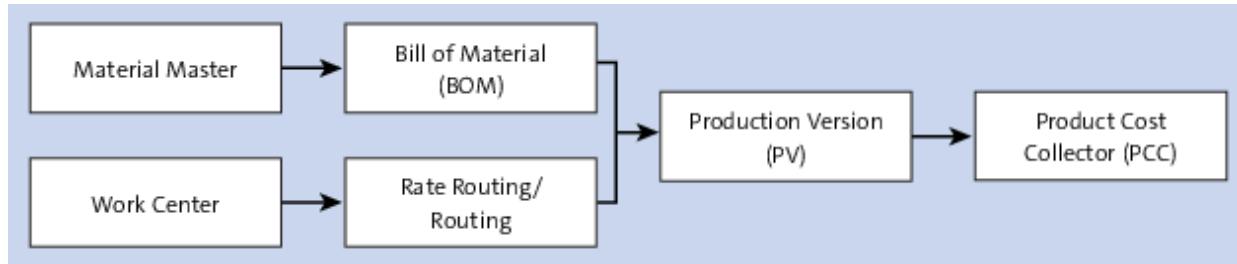


Figure 6.2 Master Data for Repetitive Manufacturing

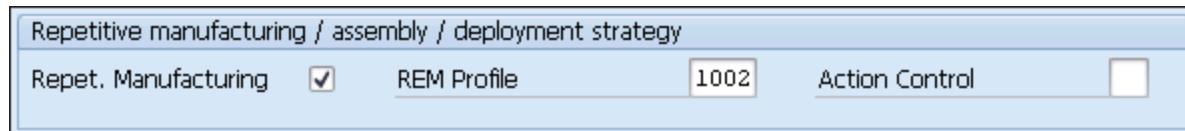


Figure 6.3 Material Master Fields Relevant for Repetitive Manufacturing

| Action | Description |
|--------|--------------------------------------|
| BEMA | Explode BOM; check availability |
| BFPL | Backflush planned order |
| BOME | Explode BOM |
| CPOD | Change planned order |
| DLPL | Delete planned order |
| FIKM | Firm planned order components |
| FIRM | Firm planned order header |
| MAAV | Check material availability |
| NEMA | Check availability w/o BOM explosion |
| PRNT | Print component list |
| RSMA | Reset material availability |
| SCHE | Scheduling |

Figure 6.4 Repetitive Manufacturing: Actions

Execute Action for Planned Order

Planned Order

Last action

New action

New planned order data

| | |
|--------------------------------------|---|
| Order Quantity <input type="text"/> | Order End Date <input type="text"/> |
| Scrap Quantity <input type="text"/> | Order Start <input type="text"/> |
| Prod. Version <input type="text"/> | Opening Date <input type="text"/> |
| Sequence Number <input type="text"/> | <input type="checkbox"/> Firm <input type="checkbox"/> Delete firm. ind. |

Data confirmation

| | |
|--------------------------------------|--|
| Posting Date <input type="text"/> | Serial Number <input type="button" value="..."/> |
| Document Date <input type="text"/> | |
| Doc.Header Text <input type="text"/> | |
| Receiving SLoc <input type="text"/> | |
| To batch <input type="text"/> | |
| Backflush qty <input type="text"/> | <input type="button" value="..."/> |
| Scrap Quantity <input type="text"/> | |
| Reason <input type="text"/> | |

Figure 6.5 Planned Order: Action Control

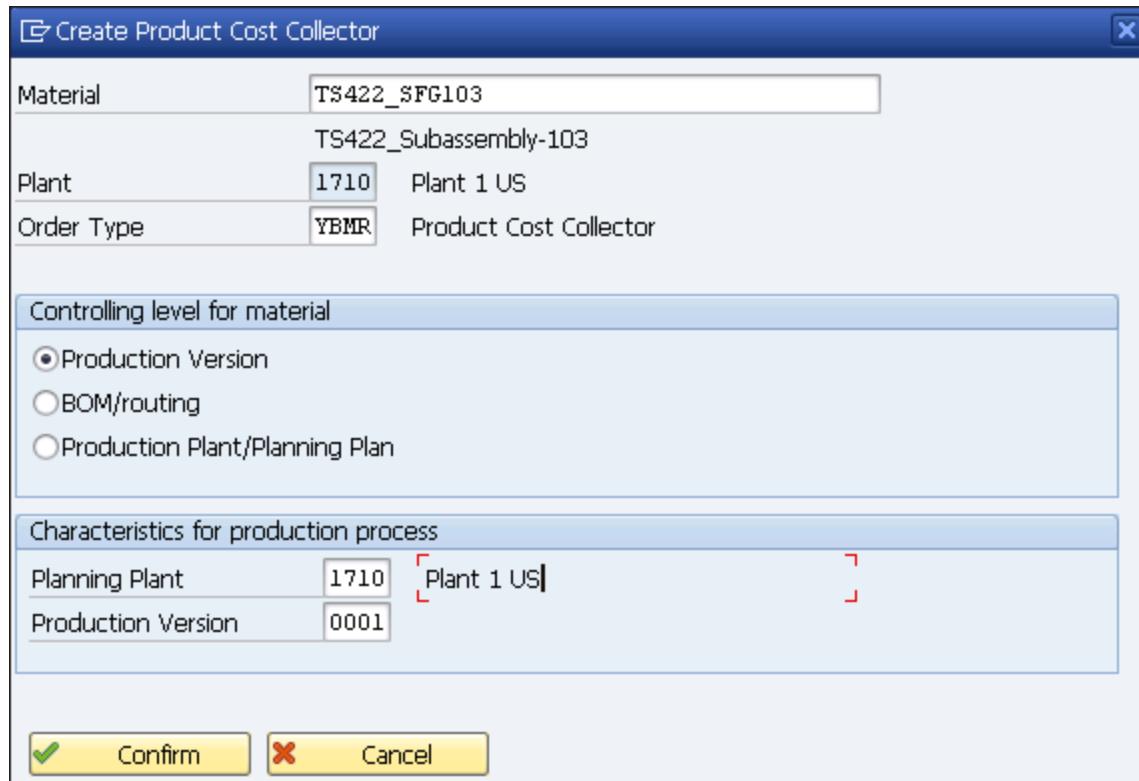


Figure 6.6 Product Cost Collector (Transaction KKF6N)

 Planning Table Initial Screen: Change Mode

More ▾

MRP area:

Plant:

Selection by production version

Production line:

WkCtr hierarchy:

Nodes WkC.hier.:

Material:

Product group:

Class:

Class type:

MRP controller:

Figure 6.7 REM Planning Table: Transaction MF50

| | |
|--|---|
| <p>Additional selections</p> <p>1 Period Scheduling Control MRP segments</p> <p>Period of Examination</p> <p>Start: <input type="text" value="17.11.2021"/> End: <input type="text" value="16.01.2022"/></p> <p>Periods and Calendar</p> <p>* Period: <input type="text" value="T Day"/> Planning Calendar: <input type="text"/></p> | <p>Additional selections</p> <p>2 Period Scheduling Control MRP segments</p> <p>Detailed Planning: <input checked="" type="radio"/> Sequencing: <input type="radio"/></p> <p>Details for detailed/rate-based planning</p> <p>Prod./basic dates: <input type="text" value="1 Production dates"/> * Scheduling strategy: <input type="text" value="2 Backward scheduling"/></p> <p>Capacity planning: <input checked="" type="checkbox"/> Only cap.cat.relf.sched.: <input type="checkbox"/></p> |
| <p>Additional selections</p> <p>Period Scheduling Control MRP segments</p> <p>Additional lines / materials Constraints</p> <p>Material overview: <input type="checkbox"/> Only mats with production: <input type="checkbox"/> Line overview: <input type="checkbox"/> Only mats with reqmts: <input type="checkbox"/> Sel. production only: <input type="checkbox"/></p> <p>Selection rule</p> <p>Selection rule: <input type="text"/></p> <p>Unit of measure / Scenario</p> <p>* Standard UoM: <input type="text" value="01 Base unit of measure"/> Comparison scenario: <input type="text"/></p> | <p>Additional selections</p> <p>4 Period Scheduling Control MRP segments</p> <p>Display of MRP segments: <input type="text" value="Aggregated Display"/></p> <p>Planning segments in decompressed display</p> <p>Net reqmts planning: <input checked="" type="checkbox"/> Plng w/o assembly: <input checked="" type="checkbox"/> Gross planning: <input checked="" type="checkbox"/> Storage location MRP: <input checked="" type="checkbox"/> Direct Production: <input checked="" type="checkbox"/> Individual project: <input checked="" type="checkbox"/> Make-to-order planng: <input checked="" type="checkbox"/> Sales document: <input type="text"/> Excluded stor. loc.: <input checked="" type="checkbox"/> Storage location: <input type="text"/></p> |

Figure 6.8 REM Planning Table: Additional Selections

SAP Planning Table for Repetitive Manufacturing: Change Mode

The screenshot shows a SAP planning interface for repetitive manufacturing. It features a toolbar with various functions like Select block, Deselect All, Reassign, Move, Create order, Situation, Switch mode, Expand, Collapse, Select material, Select line, More, and Exit. Below the toolbar are two tables:

| Total Capacity Data | | Un | Due | WE 17.11.21 | TH 18.11.21 | FR 19.11.21 | SA 20.11.21 | SU 21.11.21 | MO 22.11.21 | TU 23.11.21 | WE 24.11.21 |
|--------------------------|--------------------------------|----|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <input type="checkbox"/> | TS422_01/001 TS422 - Produ % | | 2.292 | 131.975 | 100 | 19.125 | 16.663 | | | | |
| <input type="checkbox"/> | Requirement- Vorschlagkapazi H | | | 3 | 11 | 8 | 2 | 1 | | | |
| <input type="checkbox"/> | Available- Vorschlagkapazi H | | | | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| <input type="checkbox"/> | TS422_02/001 TS422 - Produ % | | | | | | | | | | |
| <input type="checkbox"/> | Requirement- Vorschlagkapazi H | | | | | | | | | | |
| <input type="checkbox"/> | Available- Vorschlagkapazi H | | | | 8 | 8 | 8 | | 8 | 8 | 8 |
| <input type="checkbox"/> | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | |

| Material Data | | Un | Due | WE 17.11.21 | TH 18.11.21 | FR 19.11.21 | SA 20.11.21 | SU 21.11.21 | MO 22.11.21 | TU 23.11.21 | WE 24.11.21 |
|--------------------------|-------------------------|----|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <input type="checkbox"/> | TS422_SFG103 TS422_Suba | | | | | | | | | | |
| <input type="checkbox"/> | Available Quantity | PC | | | | | | | | | |
| <input type="checkbox"/> | Σ Total Requirements | PC | 11053 | | | | | 500 | | | |
| <input type="checkbox"/> | 0001 TS422_01 | PC | 340 | 335 | | 10218 | 500 | | | | |
| <input type="checkbox"/> | 0002 TS422_02 | PC | | | | | | | | | |
| <input type="checkbox"/> | Not Assigned | PC | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | |

Figure 6.9 Planning Table for Repetitive Manufacturing

| Pull List: Storage Location Level | | | | | | | | | | | | | | | |
|--|--------|-----------------------------|-------------------------|----------|------------|-----------------|-----------------|--------------|----------------------|-----------------|------------|--------|------|-------|------|
| Additional Data | | | Replenishment Proposals | | | Available Stock | | | | | | | | | |
| Plant | 1710 | Selection period for reqmts | | | 24.03.2021 | | | | | | | | | | |
| E | D. | Status | Plnt | Material | Iss... | Reqmts date | NetReq... | Avail. stock | Miss. qty | Quantity staged | Remaini... | U... | | | |
| | OC | OC | 1710 | R-411 | 171C | 18.03.2021 | 515 | 250 | 265 | 265 | 0PC | RAW411 | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| E | S. | RepElm | Plnt | Material | Iss... | Re... | Quantity staged | U... | Material description | Reqmts date | S... | B... | V... | Batch | S... |
| | StkTrn | 1710 | R-411 | 171C | 171A | | 265PC | RAW411,PD | 23.03.2021 | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Figure 6.10 Pull List: Storage Location Level

SAP REM Confirmation - Transaction Variant: None

Post with Correction Details Scrap Documents Document-Specific Reversal Document-Neutral Reversal Initial Screen More ▾ Exit

Posting Header

* Posting Date: 23.03.2021
* Document Date: 23.03.2021
Document Header Text:

Confirmation Type Yield Confirm.

Assembly backflush: Conf. Qty: 20 Unit of Meas.: PC
Component backflush:
Activity backflush:

Make-to-Stock **Make-to-Order** **Production by Lot**

Material: TS422_SFG103
Description: TS422_Subassembly-103
Plant: 1710 Production Version: 0001 Coll. Entry
Planning Plant: 1710 Date of Manufacture: SLED/BBD:
Receiving SLoc: 171A Receiving Batch:
Warehouse No.: Destination Bin:
RP Confirmation: Reporting Point: RP Stocks

Selection Data

Planned Order: Revision Level:
Production Line: TS422_01 Planning ID:

Post Continue Cancel

The screenshot shows the SAP REM Confirmation application. At the top, there's a SAP logo and the title 'REM Confirmation - Transaction Variant: None'. Below the title is a navigation bar with links like 'Post with Correction', 'Details', 'Scrap', etc. The main area is divided into sections: 'Posting Header' (with fields for Posting Date, Document Date, and Document Header Text), 'Confirmation Type' (set to 'Yield Confirm.'), 'Make-to-Stock', 'Make-to-Order', and 'Production by Lot'. Under 'Production by Lot', there are fields for Material, Description, Plant, Planning Plant, Receiving SLoc, Warehouse No., RP Confirmation, and various dates and IDs. Below these is a 'Selection Data' section with fields for Planned Order, Production Line, Revision Level, and Planning ID. At the bottom right are buttons for 'Post', 'Continue', and 'Cancel', with 'Post' being highlighted.

Figure 6.11 REM Confirmation App

GR and GI with document 4900000581 and activities posted

Figure 6.12 REM: Assembly Confirmation Posting

Details

Defaults REM Profile 1002

| | |
|-------------------------------------|-------------------------------------|
| Activity Posting | |
| No activity posting | <input type="radio"/> |
| Activity Posting | <input checked="" type="radio"/> |
| Stock Type | |
| Unrestr. Stock | <input checked="" type="radio"/> |
| Inspection Stock | <input type="radio"/> |
| Blocked Stock | <input type="radio"/> |
| Reporting Point Confirmation | |
| Foll-up post.rep.pnt | <input type="checkbox"/> |
| Other Settings | |
| Post ordering costs | <input type="checkbox"/> |
| Component scrap | <input type="checkbox"/> |
| TTZ Logic Complete Withdrawal | <input type="checkbox"/> |
| Movement Types | |
| Goods Receipt | 131 |
| Goods issue | 261 |
| GR indiv.sales order | 571 |
| GI indiv.stck/salesOrd | 572 |
| GI plntstk/salesOrd. | 291 |
| Scrap | 551 |
| By-product | 531 |
| Other REM Profile Data | |
| Cost est. | 1 |
| Post GR and GI | 1 |
| Reducing prod. qties | 1 |
| Reduction period | 3 |
| Error correction | 2 |
| Backlogs frm backfl. | 3 |
| Reporting point | <input type="checkbox"/> |
| Automatic GR | <input type="checkbox"/> |
| Planned Orders | 1 |
| Post Sync. to Bin | <input checked="" type="checkbox"/> |
| Aggregation | |
| Aggregated dependent reqmts | <input type="checkbox"/> |
| W/o Phant. Assemblies | <input type="checkbox"/> |
| Process Control | <input type="checkbox"/> |
| Backflushing | <input type="checkbox"/> |
| Calc.actual costs | <input type="checkbox"/> |

Figure 6.13 REM Confirmation: Details

REM Confirmation - Transaction Variant: None

Post with Correction Details Scrap Documents Document-Specific Reversal Document-N

Posting Header

| | |
|----------------------|------------|
| Posting Date | 24.03.2021 |
| Document Date | 24.03.2021 |
| Document Header Text | |

Confirmation Type

| | | |
|---------------------|----------------------------------|------------------------------------|
| Assembly backflush | <input checked="" type="radio"/> | Yield Confirm. |
| Component backflush | <input type="radio"/> | Conf. Qty <input type="text"/> |
| Activity backflush | <input type="radio"/> | Unit of Meas. <input type="text"/> |

Production Options:

- Make-to-Stock
- Make-to-Order
- Production by Lot

Material Data:

| | | | | |
|-----------------|-------------------------------------|---------------------|-------------------------------|------------------------------------|
| Material | TS422_FG100 | | | |
| Description | | | | |
| Plant | 1710 | Production Version | 0001 <input type="checkbox"/> | <input type="button"/> Coll. Entry |
| Planning Plant | | Date of Manufacture | | SLED/BBD |
| Receiving SLoc | | Receiving Batch | | |
| Warehouse No. | | Destination Bin | | |
| RP Confirmation | <input checked="" type="checkbox"/> | Reporting Point | 0030 | <input type="button"/> RP Stocks |

Selection Data:

| | | | |
|-----------------|--|----------------|----------------------|
| Planned Order | | Revision Level | <input type="text"/> |
| Production Line | | Planning ID | |

Figure 6.14 Reporting Point Backflush

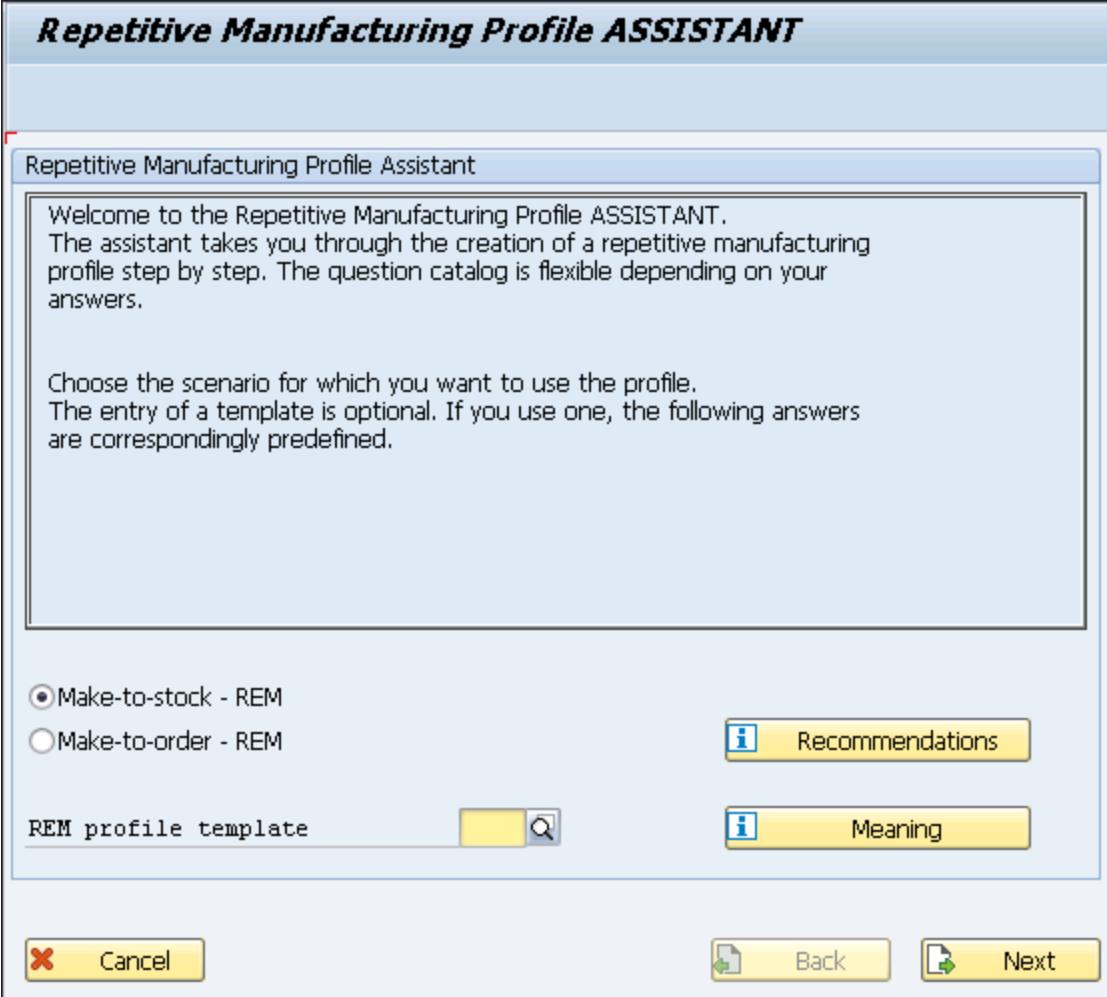


Figure 6.15 Repetitive Manufacturing Profile Creation with Assistant

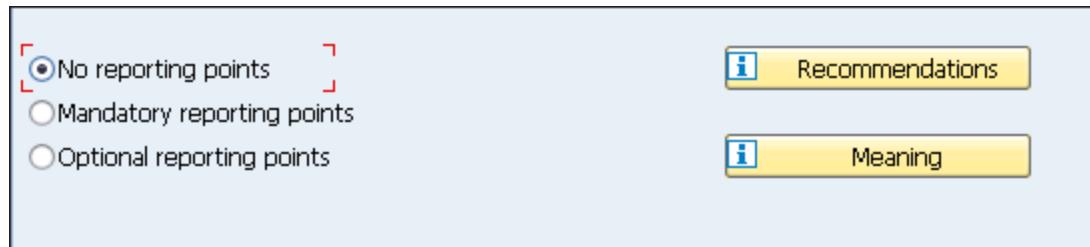


Figure 6.16 REM Profile: Reporting Points Processing



Figure 6.17 REM Profile: Posting Activities

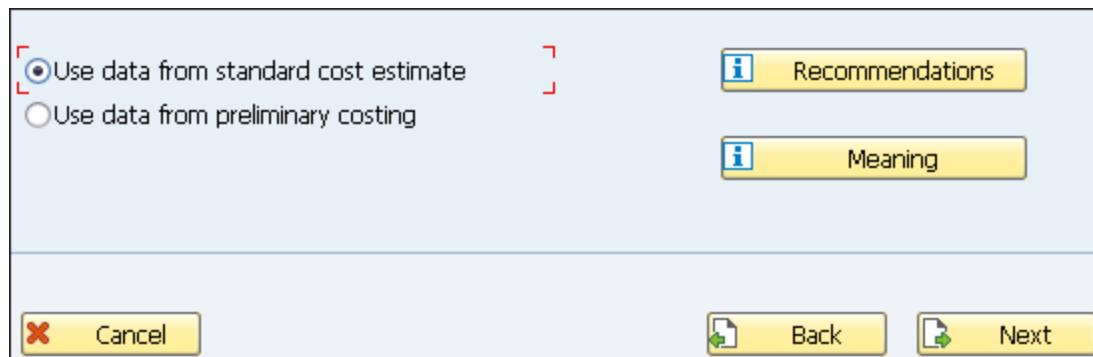


Figure 6.18 REM Profile: Costing



Figure 6.19 REM Profile: Automatic GR

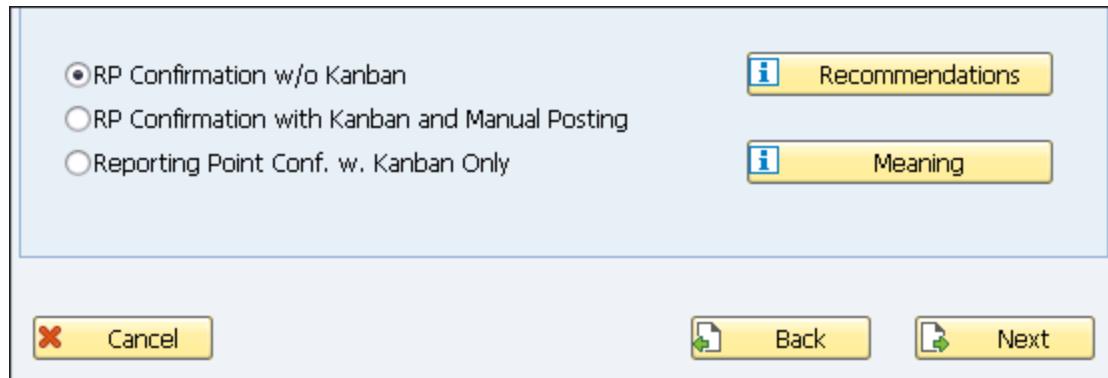


Figure 6.20 REM Profile: Reporting Point Confirmation with Kanban



Figure 6.21 REM Profile: Separated Backflush

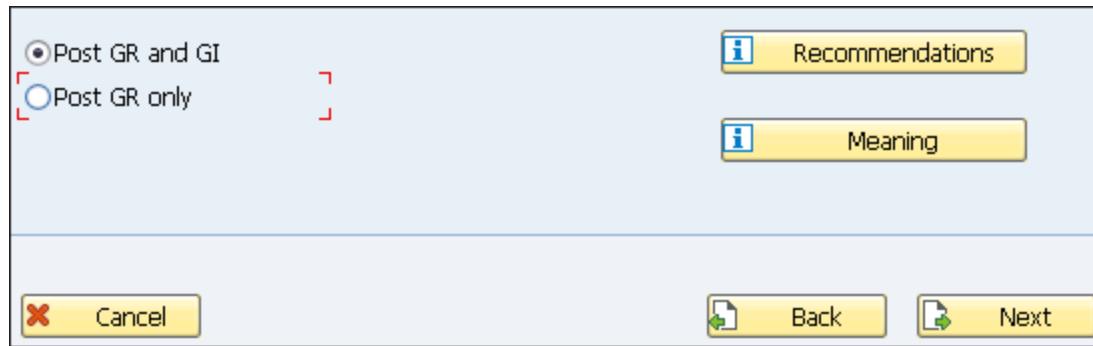


Figure 6.22 REM Profile: Automatic GR and GI

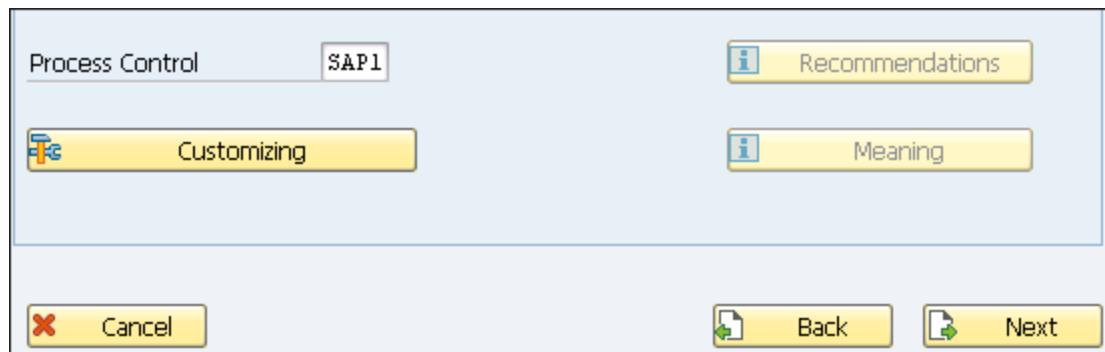


Figure 6.23 REM Profile: Process Control

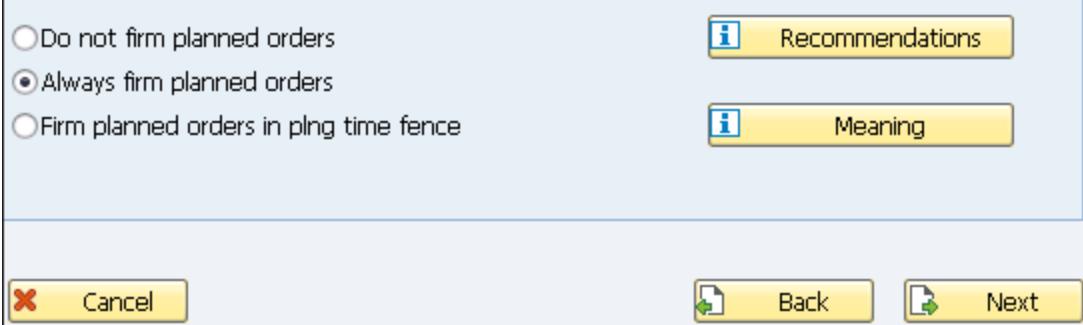


Figure 6.24 REM Profile: Firming Logic of Planned Orders



Figure 6.25 REM Profile: Reduction of Planned Order Quantities

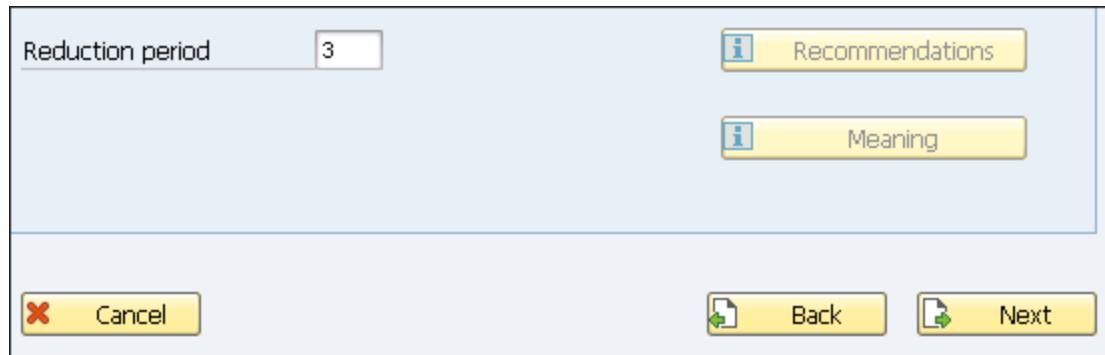


Figure 6.26 REM Profile: Reduction Period

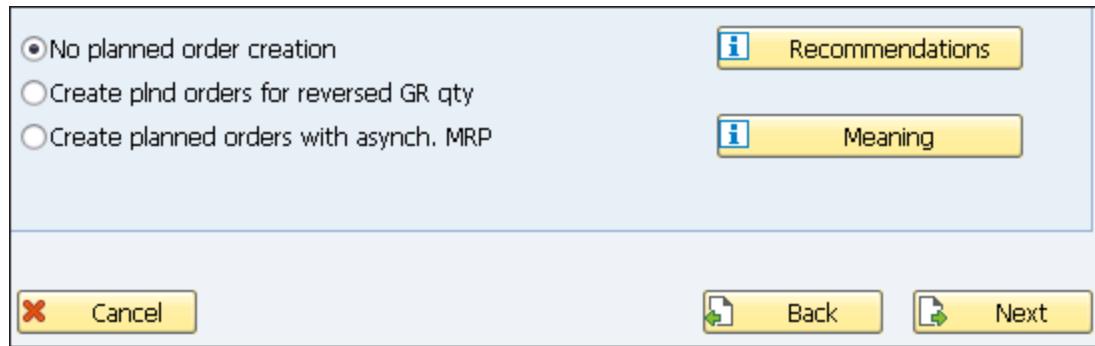


Figure 6.27 REM Profile: Re-Creation of Planned Orders at Backflush Reversal



Figure 6.28 REM Profile: Error Correction When Backflushing

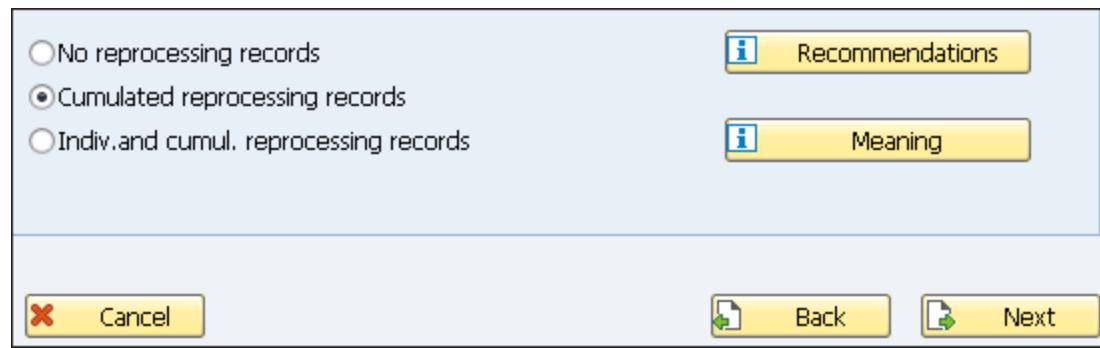


Figure 6.29 REM Profile: Reprocessing Records

| | | | |
|---------------|-----|------------------------|-----|
| Goods issue | 261 | Goods issue/reversal | 262 |
| Goods Receipt | 131 | Goods receipt/reversal | 132 |
| Scrap | 551 | Scrap/reversal | 552 |
| By-product | 531 | By-product/reversal | 532 |

 Recommendations  Meaning

 Cancel  Back  Next

Figure 6.30 REM Profile: Movement Types for MTS Scenario

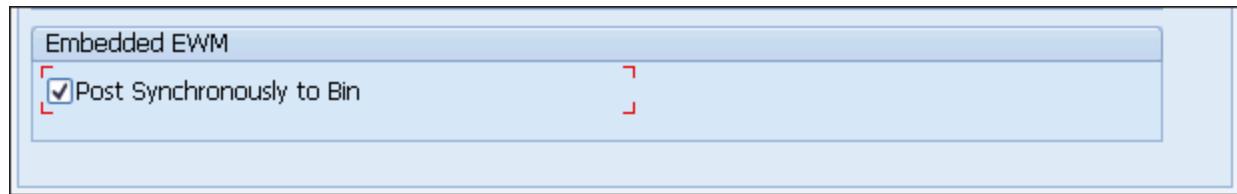


Figure 6.31 REM Profile: Synchronous Backflush Posting

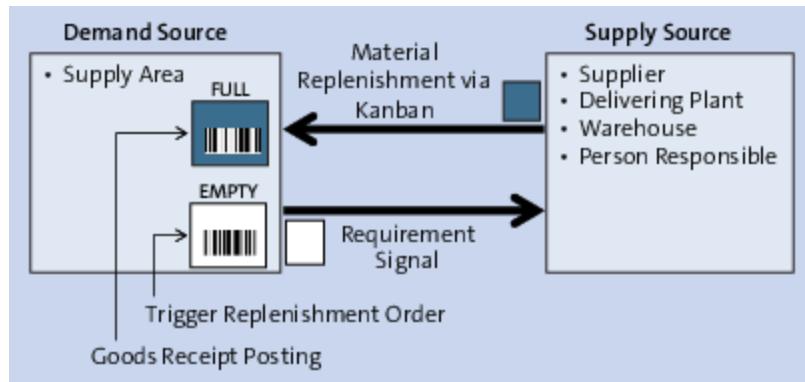


Figure 6.32 Kanban Replenishment

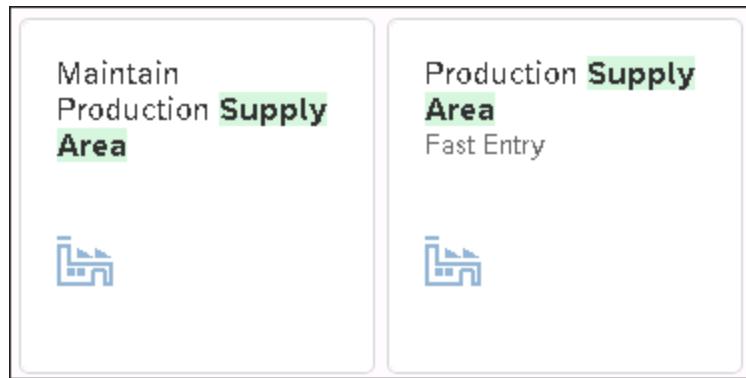


Figure 6.33 SAP Fiori Apps to Create Production Supply Areas

< SAP Display View "Production Supply Area": Details

Previous Entry Next Entry Other Entry... Address More ▾

| | | |
|------------------------------|------------------------|-----------------------|
| Plant: | 1710 | Plant 1 US |
| Supply Area: | TS422_PSA1 | TS422-PSA1 for Kanban |
| Storage Location: | 171E | KANBAN |
| Responsible: | KA1 | TS422_PSA Respble |
| (Auto) Unloading Point: | | |
| Unloading Point: | Assembly Area - Ramp 1 | |
| Loading Point | | |
| Factory Calendar (Consumer): | | |
| Shift Grouping (Consumer): | | |
| Shift Sequence (Consumer): | | |
| Pull Interval [Days]: | 0 | |
| Pull Interval [h:min]: | | |

Figure 6.34 Production Supply Area



Manage Kanban
Control Cycles

Figure 6.35 Manage Kanban Control Cycles App

SAP Control Cycle Maintenance: Change

Search Hide Selection Screen More ▾

Mass Processing:

[More Search Parameters] [Delete] [Print] [Display Containers] [Print Kanban Card] [Trigger Calculation] [Reset Strategy] [Edit Address] [Delete Address] [Toggle Category] [Display Changes] [Check]

Control Cycle 5

Material: R-411 RAW411,PD
Plant: 1710 Plant 1 US
Supply Area: TS422_PSA1 S422-PSA1 for Kanban
Storing Position:

Lifecycle
★ Status: In Preparation
Creation Date: 21.03.2021 Release Date: Lock Date:

Kanban Containers
Number of Containers: 5
Container Quantity: 10 PC
Container Material:
Maximum Empty Containers:
Number of Load Carriers:
Stock Transfer Flow Control Kanban Calculation Print Control
Stock Transfer: PD10
Storage Location: 171A Std. storage 1
Source Supply Area:

Save control cycles: 1 CC newly created, 0 changed, 0 deleted

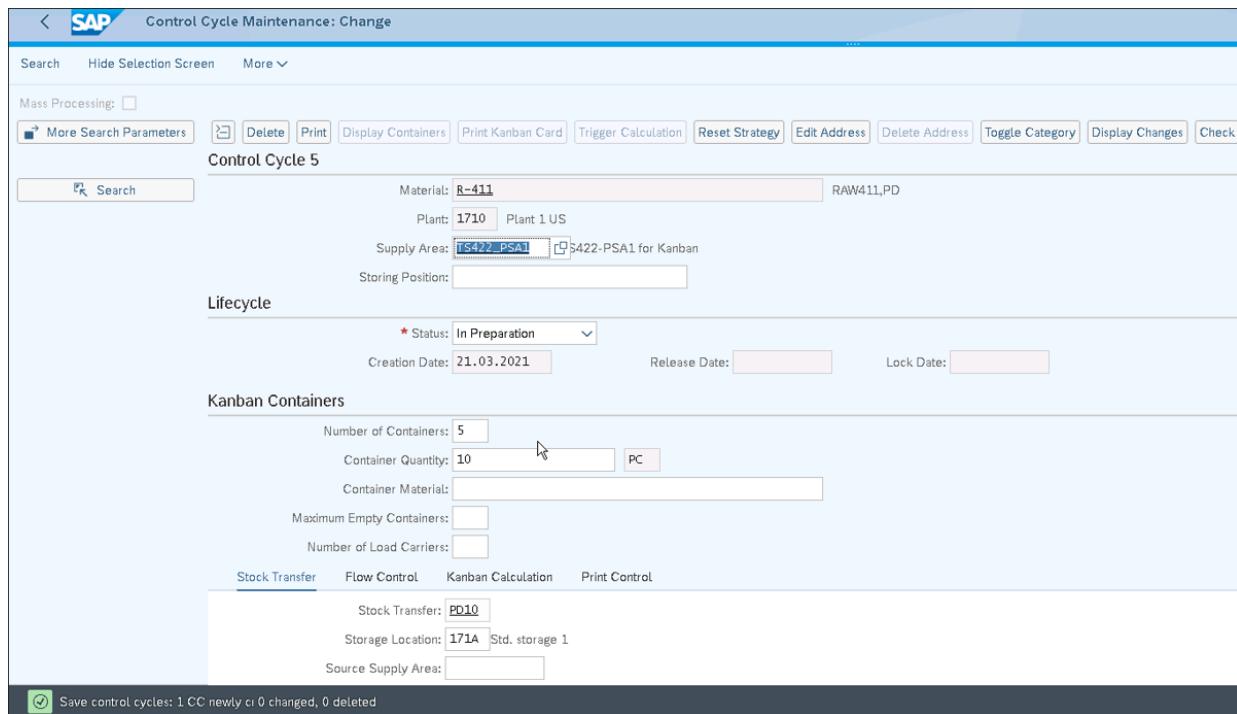


Figure 6.36 Creation of the Kanban Control Cycle

| Replenishment Strategy | Flow Control | Kanban Calculation | Print Control |
|---|--------------|--------------------|---------------|
| <input type="radio"/> In-House Production | | | |
| <input type="radio"/> External Procurement | | | |
| <input checked="" type="radio"/> Stock Transfer | | PD10 | |

Figure 6.37 Control Cycle: Stock Transfer Replenishment Strategy

| | | | |
|--|--------------|--------------------|---------------|
| Stock Transfer | Flow Control | Kanban Calculation | Print Control |
| Stock Transfer: <input type="text" value="PD10"/> | | | |
| Storage Location: <input type="text" value="171A"/> Std. storage 1 | | | |
| Source Supply Area: <input type="text"/> | | | |

Figure 6.38 Stock Transfer Replenishment Strategy:
Storage Location Assignment

- 1 Working with kanbans and cost collector**
- 2 Processing with Planned Orders and Cost Collector
- 3 Working with production orders
- 4 Replenishment using containers / MRP
- 5 Working with planned orders / MRP
- 6 Working with production orders / MRP
- 7 Processing with Cards and Reporting Points
- 8 Processing w. Cards and Reporting Points/Preplanning w. MRP

Figure 6.39 Control Types for In-House Production

- 1 Working with purchase orders**
- 2 Working with scheduling agreements
- 3 Working with stock transport order
- 4 Working with stock transport scheduling agreements
- 5 Working via source list
- 6 Replenishment using containers / MRP
- 7 Working with summarized JIT calls

Figure 6.40 Control Types for External Procurement

- 1 Stock transfer with reservation**
- 2 Direct stock transfer
- 3 Stock transfer with reservation / MRP
- 4 Direct transfer posting / MRP
- 5 Container control w/o res./stck trnsfr/ MRP
- 6 Transfer reqmts from a storage location controlled by WM
- 8 Stock Transfer with Warehouse Task
- 7 Delivery from an EWM-Controlled Storage Location

Figure 6.41 Control Types for Stock Transfer

 Kanban board: Demand Source Overview, Initial Screen

More ▾

* Plant:

Area Selection

No Area Selection:

Production Supply Area: TS422_PSA1

PSAs for Person Responsible:

PSAs for Storage Location:

Further Selection

Material:

Figure 6.42 Kanban Board: Demand Source Overview

SAP Kanban Board: Demand Source View From 02:15 Time

More ▾

Set to Empty | Set to Full |

| CntCycle | Material | Supply Area | Production Supply Area Name | Cntrnr Qty | Unit | Tracking Limit | Kanban ID | Item | Status | Change Date | Blocked | Sep. GR |
|----------|----------|-------------|-----------------------------|------------|------|----------------|-----------|------|--------|-------------|------------|---------|
| 5 | R-411 | TS422_PSA1 | TS422-PSA1 for Kanban | 10 | PC | | 12 | 2 | 1 | WAIT | | |
| | | | TS422-PSA1 for Kanban | 10 | PC | | 13 | 3 | 2 | WAIT | | |
| | | | TS422-PSA1 for Kanban | 10 | PC | | 14 | 4 | 3 | WAIT | | |
| | | | TS422-PSA1 for Kanban | 10 | PC | | 15 | 5 | 4 | WAIT | | |
| | | | TS422-PSA1 for Kanban | 10 | PC | | 11 | 1 | 9 | ERROR | 21.03.2021 | |

Figure 6.43 Kanban Board: Managing Stock Transfer Replenishment

Kanban Correction for Control Cycle 5

⚠

| | | |
|-----------------|------------|-----------------------|
| Material | R-411 | |
| RAW411,PD | | |
| Plant | 1710 | Plant 1 US |
| Supply Area | TS422_PSA1 | TS422-PSA1 for Kanban |
| Stock Transfer | PD10 | Reservation |
| Kanban Quantity | 10 | PC |

Kanbans

| Kanban ID | K... | Bl... | Actual Quantity | Status | Change D... | Change... | Replenishmt element |
|-----------|------|--------------------------|-----------------|--------|-------------|-----------|----------------------|
| 11 | 1 | <input type="checkbox"/> | 0 | ERROR | 21.03.2021 | 22:32:03 | MtlRes 0000004222 OC |
| 12 | 2 | <input type="checkbox"/> | 0 | WAIT | | 00:00:00 | |
| 13 | 3 | <input type="checkbox"/> | 0 | WAIT | | 00:00:00 | |
| 14 | 4 | <input type="checkbox"/> | 0 | WAIT | | 00:00:00 | |
| 15 | 5 | <input type="checkbox"/> | 0 | WAIT | | 00:00:00 | |

Correction

| | | | |
|-----------------|----------------------|-------|---------------------|
| Correction from | EMPTY | ----> | FULL |
| Kanban Item | 1 | | |
| Kanban Status | 9 | ERROR | Container incorrect |
| Actual Quantity | <input type="text"/> | | PC |

Kanban Corr.
 Status/Quantity
 Replenishment
 Quantity/Batch
 Reverse
 Cancel

Figure 6.44 Kanban Error Processing

| Kanban Board: Demand Source View From 03:24 Time | | | | | | | | | | | | | | |
|--|----------|----------|-------------|-----------------------------|------------|------|----------------|-----------|------|--------|-------------|------------|---------|--|
| <input type="button" value="More"/> <input type="button" value="Set to Empty"/> <input type="button" value="Set to Full"/> | | | | | | | | | | | | | | |
| | CntCycle | Material | Supply Area | Production Supply Area Name | Cntrnr Qty | Unit | Tracking limit | Kanban ID | Item | Status | Change Date | Blocked | Sep. GR | |
| <input type="checkbox"/> | 5 | R-411 | TS422_PSA1 | TS422-PSA1 for Kanban | 10 | PC | | 12 | 2 | 1 | WAIT | | | |
| | | | | TS422-PSA1 for Kanban | 10 | PC | | 13 | 3 | 2 | WAIT | | | |
| | | | | TS422-PSA1 for Kanban | 10 | PC | | 14 | 4 | 3 | WAIT | | | |
| | | | | TS422-PSA1 for Kanban | 10 | PC | | 15 | 5 | 4 | WAIT | | | |
| | | | | TS422-PSA1 for Kanban | 10 | PC | | 11 | 1 | 5 | FULL | 22.03.2021 | | |

Figure 6.45 Kanban Status Change to FULL

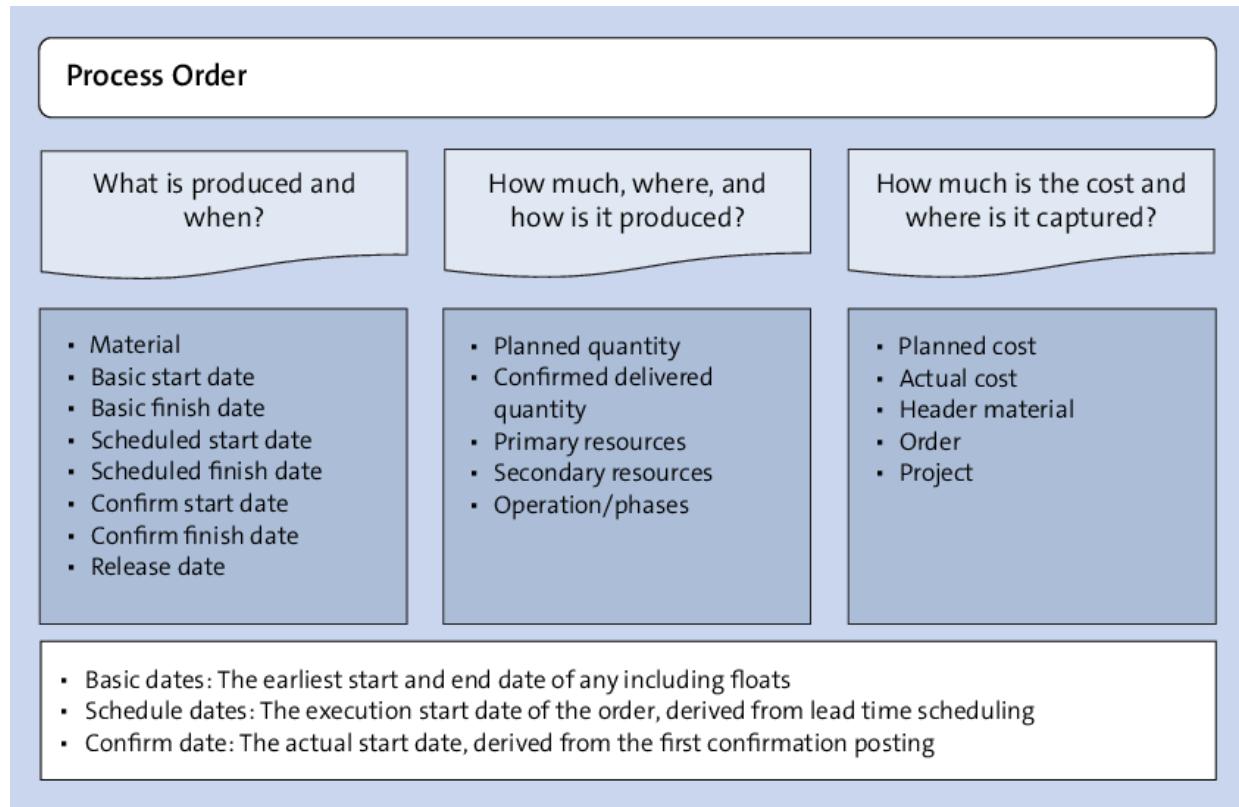


Figure 7.1 Process Orders Overview

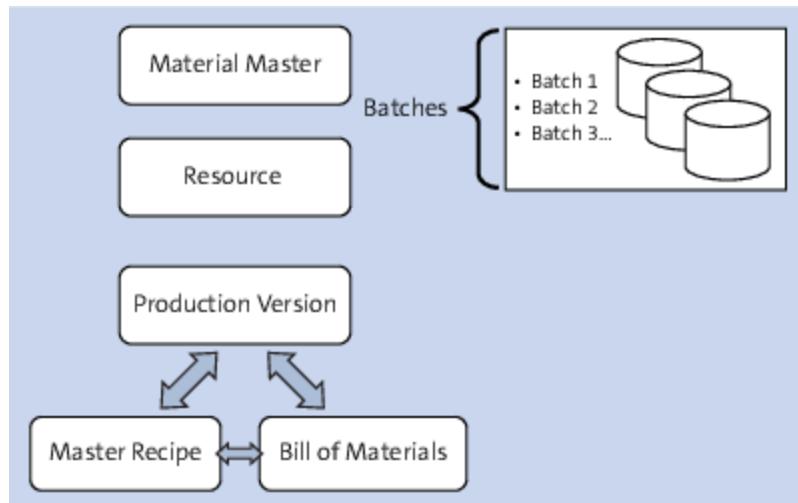


Figure 7.2 Master Data for Process Industries

| Display View "Work center category": Overview | | | | | | | | |
|---|--|------|--------------------|------------|-----------|--------------------------|-------------------------------------|-------|
| | | | | | | | | |
| Dialog Structure | | | | | | | | |
| ▼ Work center category | | | | | | | | |
| • Application | | Cat. | Description | Field sel. | Scrn seq. | Change doc | Stat.Prof. | Color |
| | | 0008 | Processing unit | 0008 | 0008 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| | | 0009 | Personnel resource | 0008 | 0009 | <input type="checkbox"/> | <input type="checkbox"/> | |

Figure 7.3 Resource Category

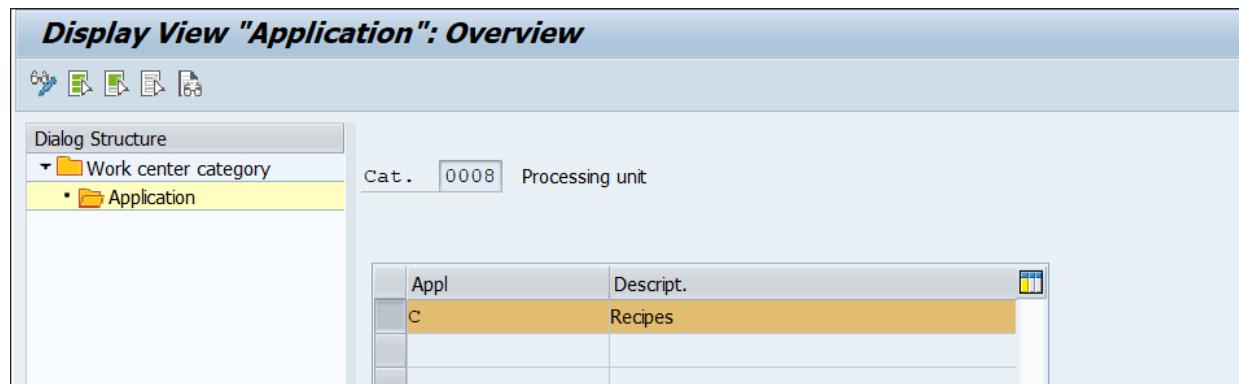


Figure 7.4 Resource Category Assignment to Application

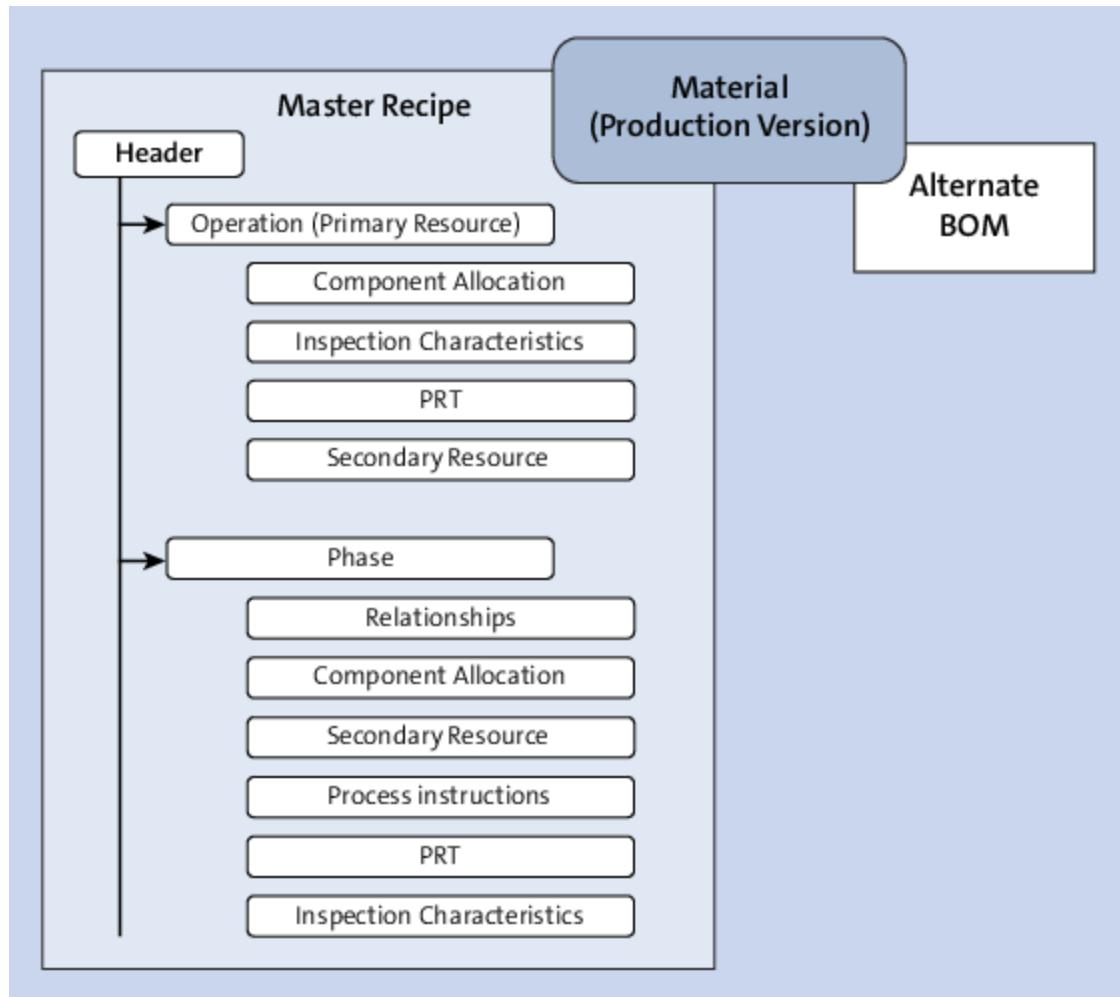


Figure 7.5 Master Recipe Structure

Change View ""Default Values for Master Recipe"": Details

New Entries

| | | |
|------------------------------------|---|------------------------------|
| Profile | PI01 | Profile for Process Industry |
| Operation | | |
| Control key | PI01 | Process manufacturing |
| Oper./act. increment | 0010 | |
| Field key | | |
| Relationship | | |
| Relationship view | Successor | |
| Level of detail | 98 | |
| Process management | | |
| Process instruction maintenance | Process Instructions | |
| Process instruction specifications | | |
| PI increment | 0010 | |
| PIC increment | 0010 | |
| Relationship graphic | | |
| Group | PI01 | |
| Name | NETWORK | |
| Operation display | Operation is displayed as medium node in graphics | |
| Phase display | Phase is displayed as medium node in graphics | |
| Relationship display | By relationship type | |
| Change parameters | | |
| Change Rule | No | |

Figure 7.6 Master Recipe Profile

Create Master Recipe: Initial Screen

Recipe Group

Recipe

OR

Material

Plant

Prod. Version

Profile

Validity

Key Date

Change Number

This screenshot shows the initial screen for creating a master recipe in SAP. The top navigation bar includes icons for Recipe Header, Operations, Materials, and reports for Recipe List Report and Material List Report. The main area contains fields for Recipe Group (highlighted with a yellow border), Recipe, Material, Plant, Prod. Version, and Profile. Below these is a 'Validity' section with fields for Key Date (set to 01.08.2021) and Change Number.

Figure 7.7 Master Recipe Initial Screen

Create Master Recipe: Recipe

Recipe Group: 50000062 | Deletion Flag: Long Text Exists:
Recipe: 1 | Test Master Recipe | 
Plant: 2062

Recipe Header | Operations | Materials | Administrative Data

Assignment

Status: 4
Usage: 1 
Planner Group: 
Resource netwrk: 
Network Plant: 

 Classification |  Quality Management |  Material Assignments

Charge Quantity Range

From: to: 99.999.999 | TskL Unit: KG

Default Values for Operations, Phases, and Secondary Resources

Base Quantity: 1,000 | Op. unit: 
Charge Quantity: 1 | Equal to: Operation Qty: 1

Change Parameters

Change Rule: No | 
Change Type: 

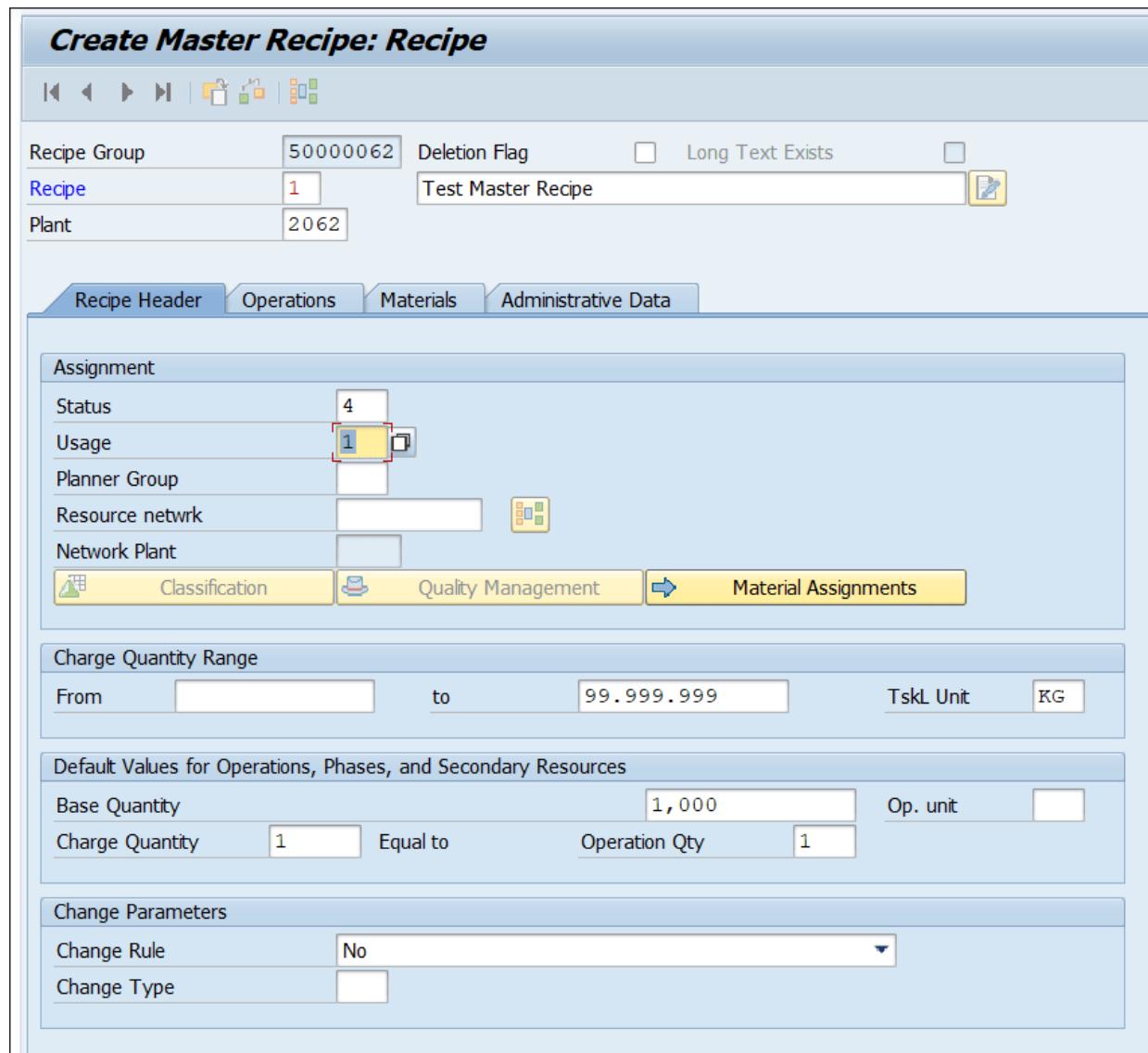


Figure 7.8 Master Recipe Header

Create Master Recipe: Recipe

Recipe Group: [] Deletion Flag: Long Text Exists:
Recipe: 1 Test Master Recipe:
Plant: 3952

Recipe Header Operations Materials Administrative Data

Ops

| Operat... | P... | Sup. ... | De... | Resource | Co... | L... | Standar... | Description | Lan... | Rel... | Cla... | Obj... |
|-----------|-------------------------------------|----------|-------|----------|-------|--------------------------|------------|-------------|--------|--------|--------------------------|--------------------------|
| 0010 | <input type="checkbox"/> | | | TIP1-1 | PI01 | <input type="checkbox"/> | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| 0020 | <input checked="" type="checkbox"/> | 0010 | P1 | TIP1-1 | PI01 | <input type="checkbox"/> | | | | X | <input type="checkbox"/> | <input type="checkbox"/> |
| 0030 | <input type="checkbox"/> | | | | PI01 | <input type="checkbox"/> | | | | X | <input type="checkbox"/> | <input type="checkbox"/> |

Figure 7.9 Master Recipe Operations

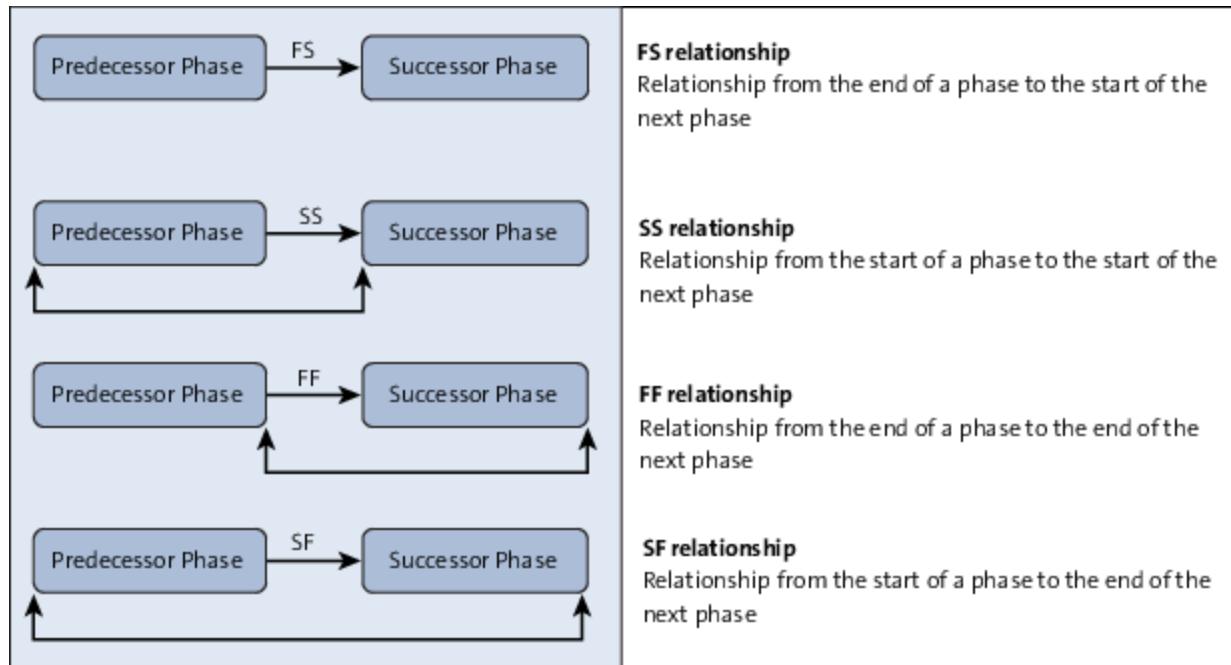


Figure 7.10 Master Recipe Relationship

Display View "Maintain Process Order Types": Details

| | | |
|----------------|------|-------------------------|
| Order Category | 40 | Process Order |
| Order Type | PI01 | Standard process orders |

Control Indicator

| | |
|---|-------------|
| CO Partner | Semi-active |
| <input type="checkbox"/> Classification | |
| Commit. Management | 1 |

Reorganization

| | | |
|-----------------|---|--------|
| Residence Time1 | 0 | Months |
| Residence Time2 | 0 | Months |

Cost Accounting Profiles

| | | |
|--|--|---------------|
| Settlement Profile | PI01 | Process order |
| Functional Area | 5350 | |
| <input type="checkbox"/> Collect. Order Processing | Collective order without automatic goods | |

Status Management

| | |
|----------------|--|
| Status Profile | |
|----------------|--|

Number Range General (processed)

Figure 7.11 Define Order Types

| Group Overview: Order, Object AUFTRAG | | | | | | |
|---------------------------------------|---------|--|-------------|-----------|--------------|---------------|
| Group | Element | Element Text | From Number | To Number | Number Range | Status Extern |
| Internal Number Assignment | | | | | | |
| | CPOM | Standard CO Production Order | 1000000 | 1999999 | | 1003859 |
| | PIO1 | Standard process orders | | | | |
| | PIO2 | Process order (external number assgnmnt) | | | | |
| | PIO4 | Filling/packaging with "Assembly order" | | | | |
| | PP01 | Standard production order | | | | |
| | PP04 | Assembly orders | | | | |
| | PPC1 | Order Type for Costing | | | | |
| | PPK1 | Production order for Kanban | | | | |
| | YBM1 | MTS Production Order | | | | |
| | YBM2 | | | | | |

Figure 7.12 Process Order Number Range

Display View "Order Type-Dependent Parameters": Details

Plant: 0001
Order Type: PI01 Standard process orders

Master Data Planning Implementation Cost Accounting Display Profiles

Production Version
Production Version: Automatic selection of production version

Recipe
 Component Detail Verif. Approval Required Operation Det. Verif.
Relationship View: Predecessor
Selection ID: 04
TL type: Master Recipe

Process Data Documentation
 Batch Record Required
 Order Record Required
 No Process Data Documentation Required

Operation
 Entry Tool
Operation Increment: 0010
Reduction Strategy:

Figure 7.13 Order-Type-Dependent Parameter: Master Data

Display View "Order Type-Dependent Parameters": Details



| | | |
|------------|------|--|
| Plant | 0001 | <input type="button" value="..."/> |
| Order Type | PI01 | Standard process orders |

Master Data Planning Implementation Cost Accounting Display Profiles

General

Assignment

Substitute MRP ctrl.

SubProdSupervisor

Reservation Relevance/PReq Generation

Reservation/Purc.req Collective requisit.

Scrap

Workflow for PO Change

Bill of Material

Application

BOM Explosion

Batch Determination

Search Procedure

Check: Specified Batch Active

Quality Inspection

Inspection Type

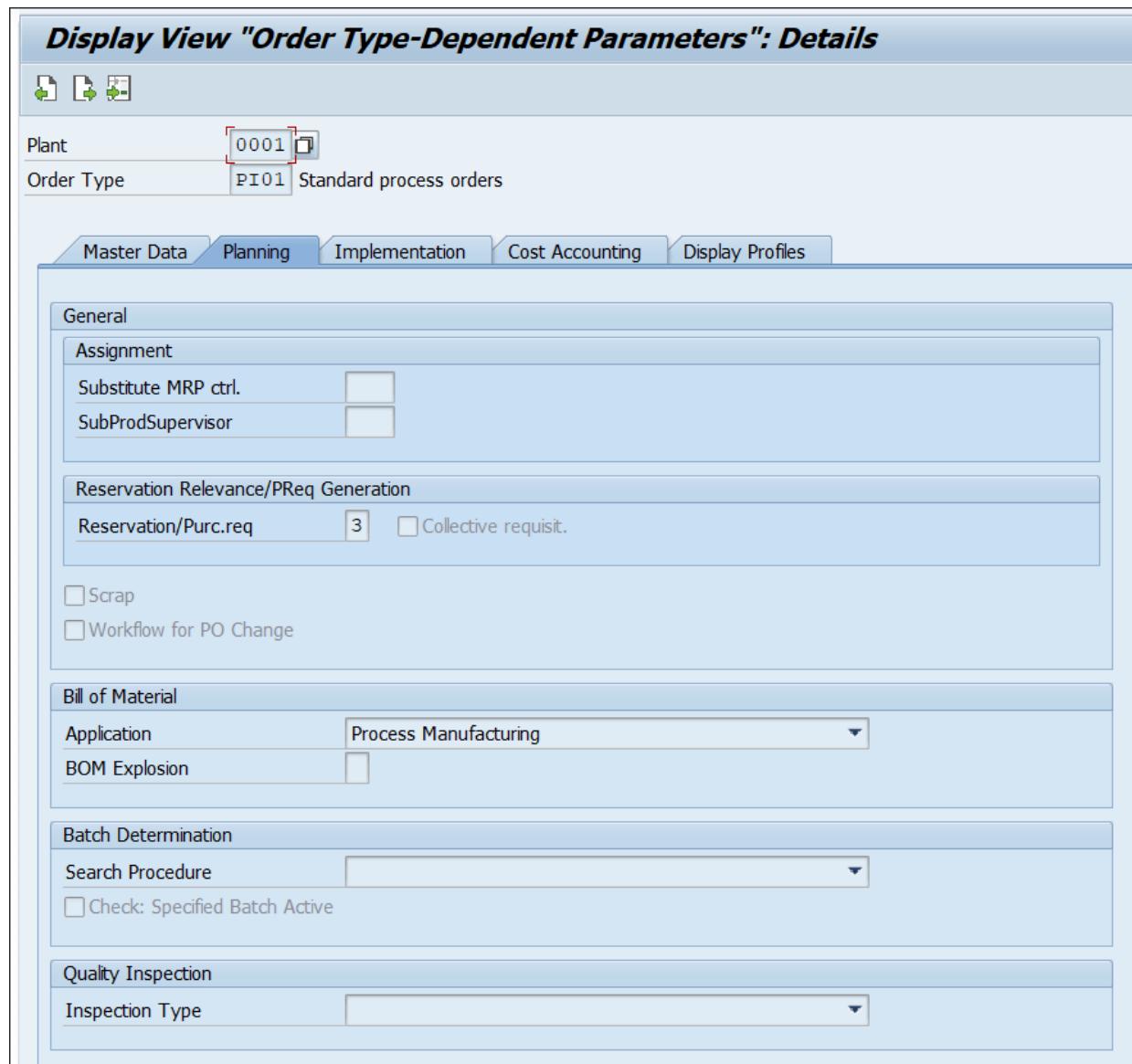


Figure 7.14 Order-Type-Dependent Parameters: Planning

Display View "Order Type-Dependent Parameters": Details

Plant: 0001
Order Type: PI01 Standard process orders

Master Data Planning Implementation Cost Accounting Display Profiles

Status Change Documents

Header Material
 Operation

Shop Floor Information System

Statistics I01
Release Versions

Header Item
 Operation

Documentation of Goods Movements

Planned Goods Issue Goods Receipt for Process Order
 Unplanned Goods Issue Goods Receipt for Purchase Order
 Goods Receipt for WIP Batch

Workflow

Workflow for Purchase Order Change

WIP Batch

Post Goods Movement for WIP Batch

Figure 7.15 Order-Type-Dependent Parameters:
Implementation

Display View "Production Scheduling Profile": Details

File

| | |
|------------|------|
| Plant | 0001 |
| PS Profile | PI01 |

Process industry

Automatic Actions

| | |
|----------------------------------|--|
| On Creation | On Release |
| <input type="checkbox"/> Release | <input type="checkbox"/> Generate Cntrl Recipe <input type="checkbox"/> Execute Printing <input type="checkbox"/> Carry Out Scheduling |

Material Availability Check

| |
|--|
| <input type="checkbox"/> Confirm Available Partial Qty |
|--|

Capacity Planning

| |
|--|
| Leveling |
| Overall profile <input type="text" value="SAPPI_G001"/> PI: View work center/capacity (graph.) |
| Availability Check |
| <input type="checkbox"/> Confirm Capacity <input type="checkbox"/> Finite scheduling |

Batch Management

| | |
|--|---|
| Auto Batch Creation | No Automatic Batch Creation in Production/Process Order |
| Classify Batches | No Branching to Batch Classification |
| <input type="checkbox"/> Extended Classification | |

Transport

| | |
|---|---|
| <input type="checkbox"/> Compl. Transfer Rqmt | <input type="checkbox"/> Confirmed Quantity for TR |
| WM Request | No Creation of Transfer Requirements on Order Release |
| <input type="checkbox"/> GI via delivery | |

Figure 7.16 Production Scheduling Profile

| | |
|--|--|
| Confirmation | |
| <input type="checkbox"/> No Update of Excess Receipt | <input type="checkbox"/> No Update of Short Receipt |
| Order Type | |
| Make-to-stock | <input type="radio"/> PI01 Standard process orders |
| Make to Order | <input type="radio"/> |
| W/o Material | <input type="radio"/> |
| BBD/SLED | |
| <input type="checkbox"/> Copy BBD/SLED to Batch Master | <input type="checkbox"/> Recalc. BBD when Rescheduling |

Figure 7.17 Production Scheduling Profile (cont.)

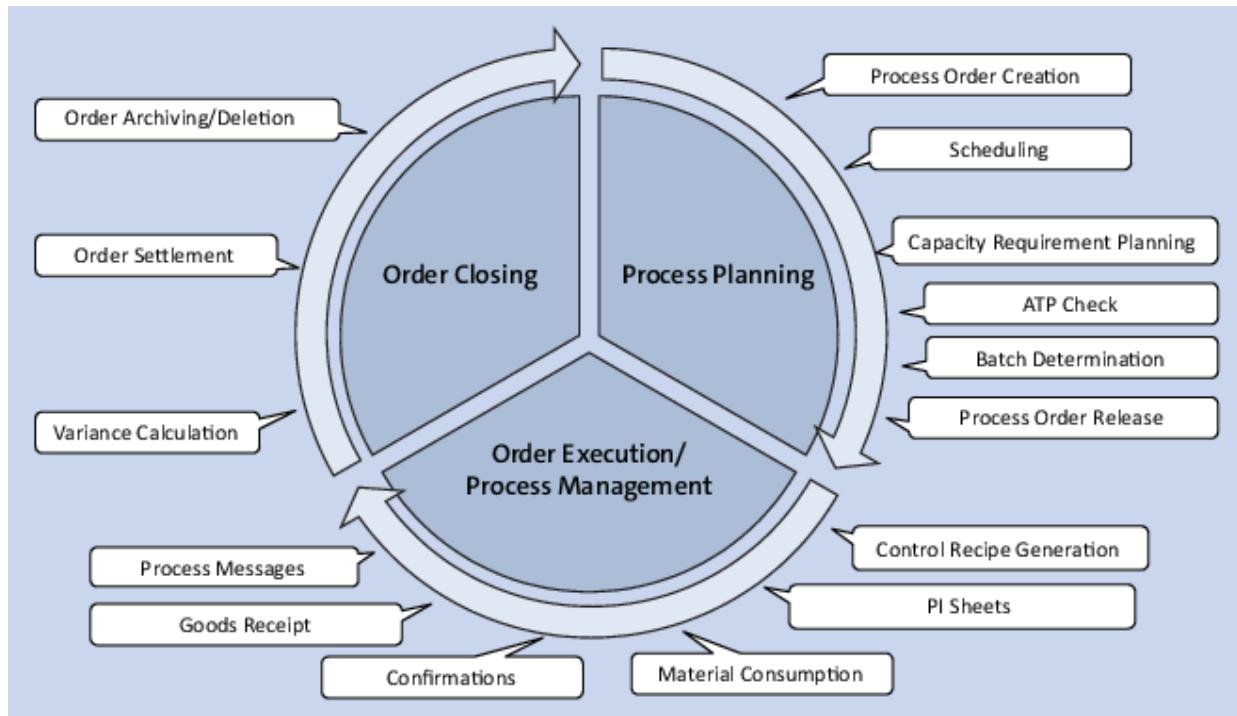


Figure 7.18 Process Order Cycle

Display View "Specify scheduling parameters": Details

Plant: 0001

Order type: PI01 Standard process orders

Prodn Superviso: *

Detailed Scheduling

Scheduling

Generate Capacity Reqs.

Adjust scheduling

Adjust Dates: Adjust basic dates, adjust dep. reqmts to operation date

Scheduling control for detailed scheduling

Scheduling Type: Forwards

Start in the Past: 0

Automatic Scheduling

Automatic log

Scheduling with breaks

From production dates

Shift Order

Latest Staging Date

Reduction

Maximum reduction level: Do not reduce

% reduction in floats: L1 L2 L3 L4 L5 L6
0 0 0 0 0 0

Figure 7.19 Process Order Scheduling Parameter

Display View "Margins for scheduling": Overview

| | Plnt | Key | Opening Period | Float After Production | Float Before Production | Release Period | |
|--|------|-----|----------------|------------------------|-------------------------|----------------|--|
| | 0001 | 000 | 0 | 0 | 0 | 0 | |
| | 0001 | 001 | 10 | 1 | 2 | 5 | |

Figure 7.20 Schedule Margin Key

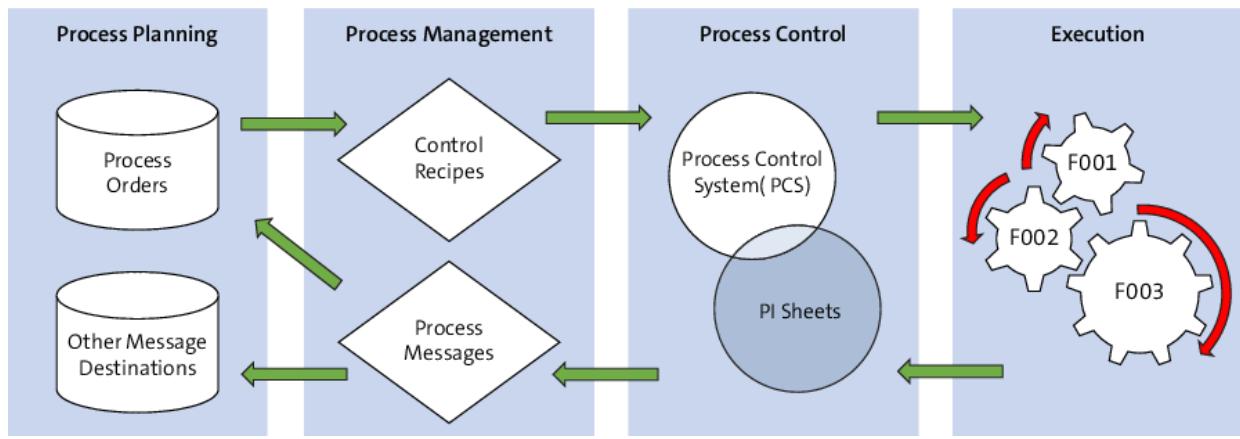


Figure 7.21 Process Management Overview

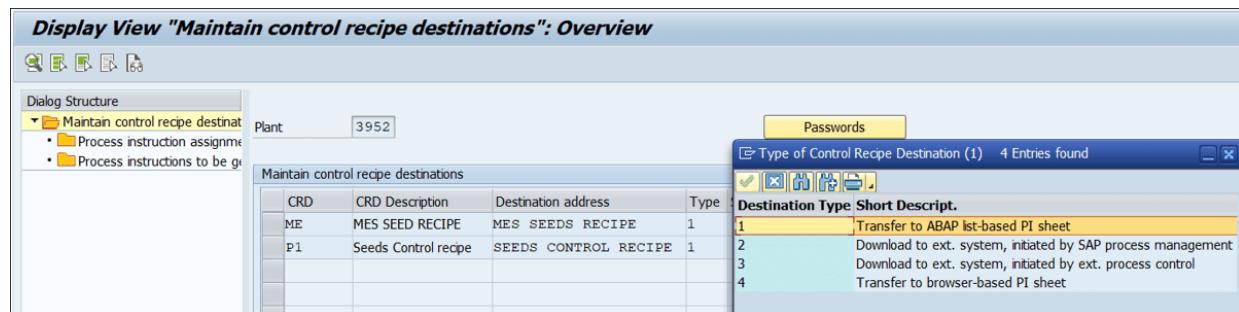


Figure 7.22 Control Recipe Destination

| Display View "Characteristics Groups": Overview | |
|---|--------------------------------------|
| | |
| Group | Char. Group |
| PPPI_01 | Process Message Characteristics |
| PPPI_02 | Process Instruction Characteristics |
| PPPI_03 | Char. for Material Flow Betw. Orders |
| PPPI_04 | Special Applications |

Figure 7.23 Process Instruction Characteristics Group

Control Recipe Monitor: Initial Screen

Plant 

Selection Criteria for Creation Period

| | |
|--|--|
| Creation Date | Information on Productive Control Recipes |
| <input checked="" type="checkbox"/> Frm <input type="text" value="22.09.2021"/> Time <input type="text" value="00:00:00"/> |  <input type="checkbox"/> Created, Sent 0  |
| To <input type="text" value="22.09.2021"/> Time <input type="text" value="24:00:00"/> |  <input type="checkbox"/> Executed 0 |
| |  <input type="checkbox"/> Terminated, Discarded 0 |

Additional Selection Criteria

| | | |
|--|--|---|
| Destination Address <input type="text"/> | Status | Mode |
| Process Order <input type="text"/> | <input checked="" type="checkbox"/> Created <input checked="" type="checkbox"/> Sent <input checked="" type="checkbox"/> Executed <input checked="" type="checkbox"/> Terminated <input checked="" type="checkbox"/> Discarded | <input checked="" type="radio"/> No Test <input type="radio"/> Test <input type="radio"/> All |

Figure 7.24 Control Recipe Monitor

Process Message Monitor: Initial Screen

Messages

Plant

Selection Criteria for Creation Period

| | |
|--|--|
| Creation Date | |
| <input type="button" value="frm"/> <input type="text" value="22.09.2021"/> | Time <input type="text" value="00:00:00"/> |
| To <input type="text" value="22.09.2021"/> | Time <input type="text" value="24:00:00"/> |

| | | |
|-----------------------|------------|-----------------------------------|
| Message Information | | |
| <input type="radio"/> | To Be Sent | 0 <input type="button" value=""/> |
| <input type="radio"/> | Sent | 0 <input type="button" value=""/> |
| <input type="radio"/> | Terminated | 0 <input type="button" value=""/> |

Additional Selection Criteria

| | | |
|--|--|--|
| Sender <input type="text"/> | Status | Mode |
| Order <input type="text"/> | To Be Sent <input checked="" type="checkbox"/> | No Test <input checked="" type="radio"/> |
| Proc.Message Cat. <input type="text"/> | Sent <input checked="" type="checkbox"/> | Test <input type="radio"/> |
| | Terminated <input checked="" type="checkbox"/> | All <input type="radio"/> |

Max. No. of Messages

This screenshot shows the initial screen of the SAP Process Message Monitor. It includes fields for plant selection, creation date and time, message status counts, additional selection criteria like sender and mode, and a maximum number of messages input field.

Figure 7.25 Process Message Monitor

Find PI Sheet

Plant to

Control Recipe to

Processor Group to

Ctrl Rec.Destination to

Created on to

Created at to

Max. number of PI sheets

Mode
 No Test
 Test
 All

Status
 New Planned for the next Hours
 In Process
 To Be Completed
 Terminated
 Discarded
 Completed
 Archived (EBR)

Process Order
Process Order to

Figure 7.26 Finding PI Sheets

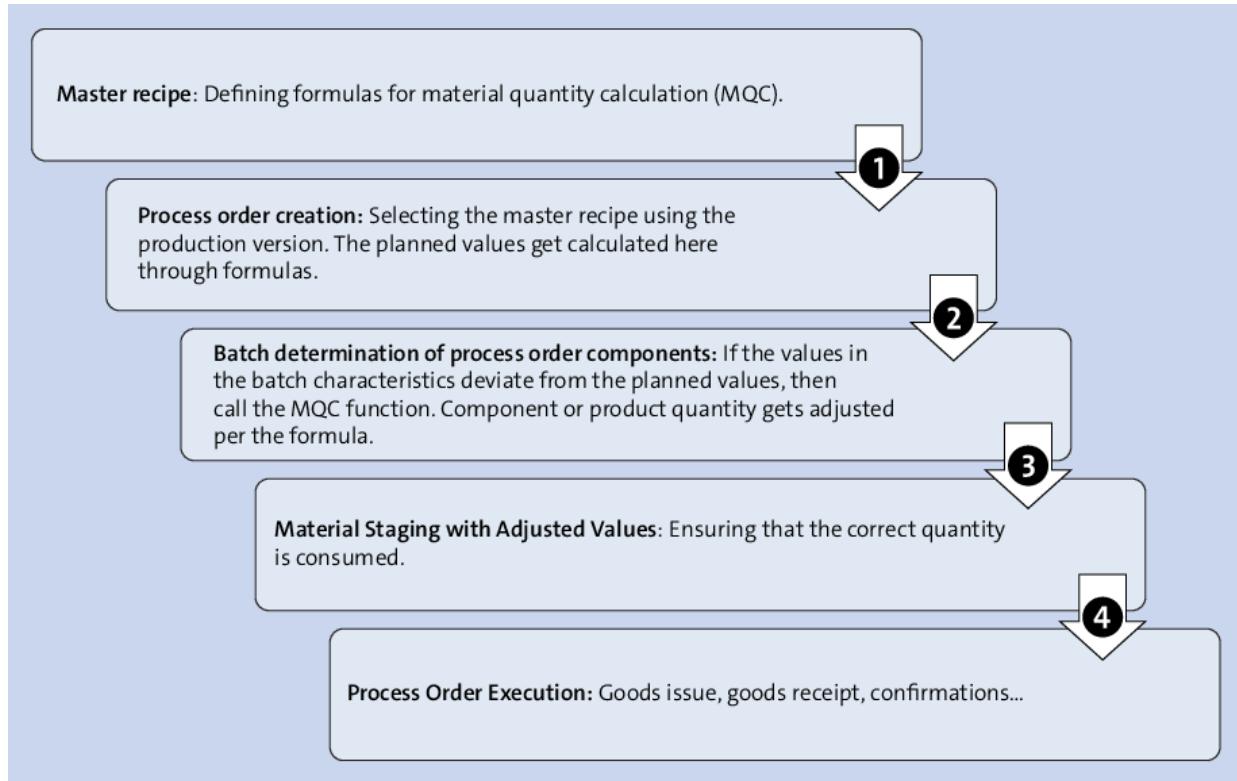


Figure 7.27 Batch Determination and Material Quantity Calculation

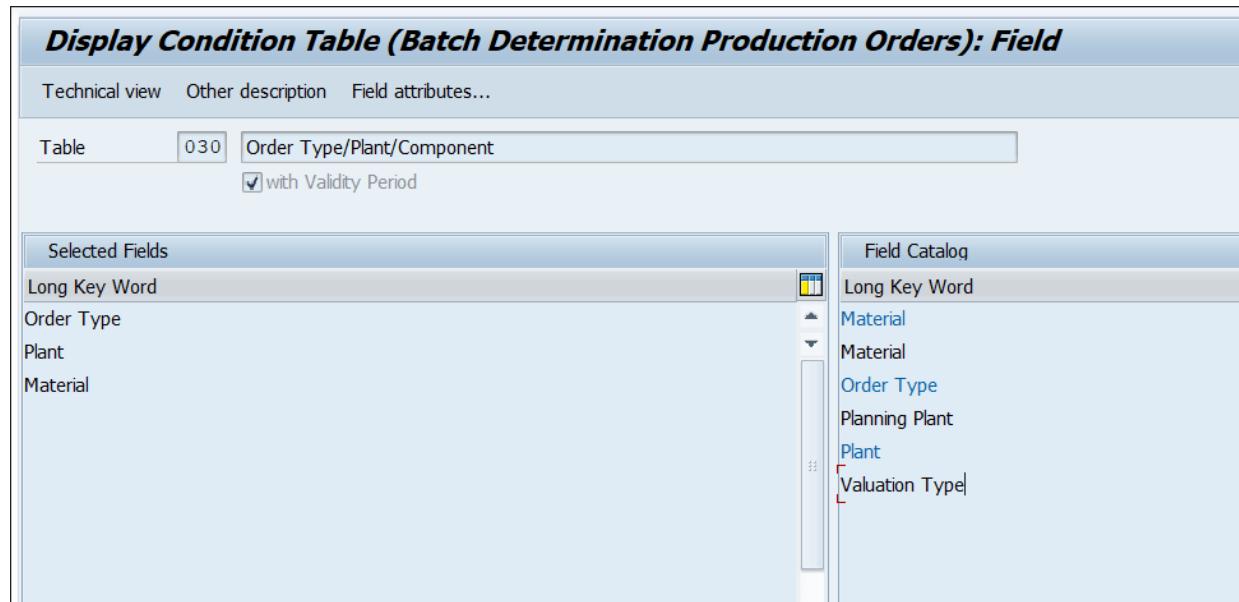


Figure 7.28 Define Condition Table

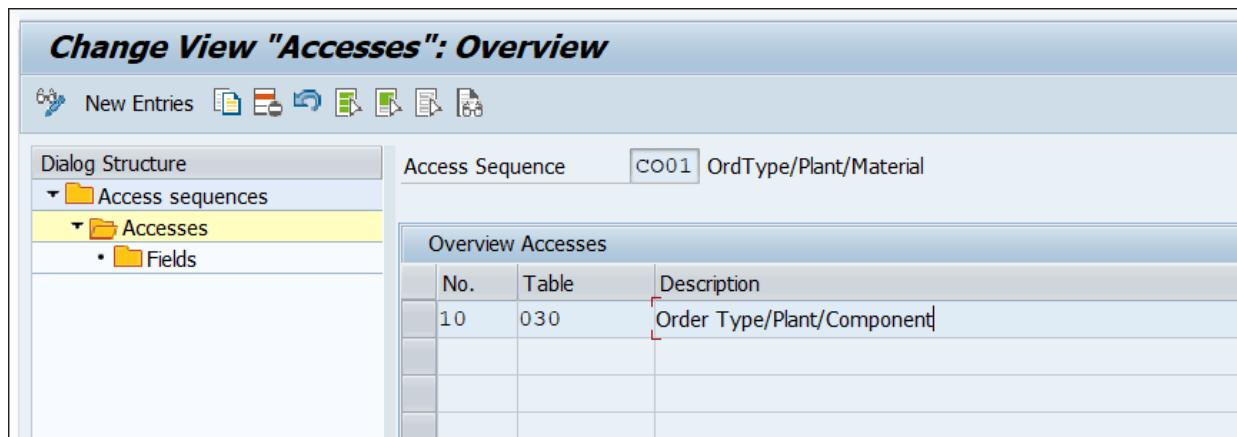


Figure 7.29 Define Access Sequence

Change View "Strategy Types": Details

New Entries

| | | |
|--------------|------|-----------------------------|
| Application | CO | Production Orders |
| Condit. type | CO01 | OrdType/Plnt/Mat |
| | | Access seq. |
| | | CO01 OrdType/Plant/Material |

Selection

| | | |
|----------------|--------------------------|---------------------------------------|
| Class Type | 023 | Batch |
| Class | <input type="text"/> | <input type="button" value="Maint."/> |
| Selection type | <input type="checkbox"/> | |

Sorting

| | | |
|---------------|----------------------|---------------------------------------|
| Sort sequence | <input type="text"/> | <input type="button" value="Maint."/> |
|---------------|----------------------|---------------------------------------|

Batch split

| | | | |
|---------------|----------------------|---|--|
| No. of splits | <input type="text"/> | <input checked="" type="checkbox"/> Changes allowed | <input type="checkbox"/> OverDel allowed |
|---------------|----------------------|---|--|

Quantity proposal

| | | | | | |
|-------------|---|--|--------------|---|---------------------------------------|
| Display UoM | A | <input checked="" type="checkbox"/> Dialog batch determin. | Qty proposal | 1 | <input type="button" value="Maint."/> |
|-------------|---|--|--------------|---|---------------------------------------|

Presentation

| | | | |
|---------------|------|--------|--------|
| Screen number | 5000 | Status | CUA_CO |
|---------------|------|--------|--------|

Figure 7.30 Define Strategy Type

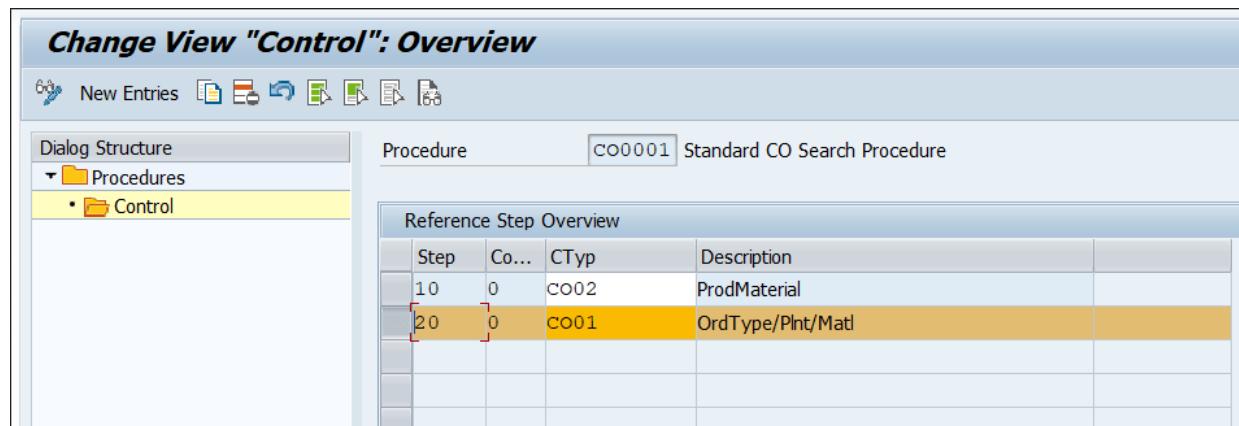


Figure 7.31 Batch Search Procedure

| Change View "Search Procedure for Batch Determination in Process Order" | | | | | |
|---|------|---------------|---------------|----------------------|-------------------------------------|
| | | | | | |
| Order category | | 40 | Process Order | | |
| Overview: Search Procs | | | | | |
| Plant | Type | Name | Search Proc. | Name | Check Batch |
| ZZZX | YBM2 | Process Order | YB0001 | BP: Search procedure | <input checked="" type="checkbox"/> |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Figure 7.32 Batch Search Assignment and Activation

Display OrdType/Plant (YQ01) : Fast Entry

Selection criteria Sort

| | |
|----------|------------|
| Plant | 0100 |
| Valid On | 22.01.2019 |

Plant/Order Type

| Ord... | Description | N... | Ch... | Dial... | Di... | Q... | Ov... | S... | S... | S... | D... |
|--------|---------------------|------|-------------------------------------|-------------------------------------|-------|------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|
| ZN01 | Process order (MTS) | 999 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | A | 1 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Figure 7.33 Batch Search Strategy

Display OrdType/Plant (YQ01) : Classification

Object

Plant Order Type
0100 ZN01

Class Type 023 Batch

Assignments

| Class | Description | Sta... | S.. | Icon | Itm |
|-------------------|-------------------------------|--------------------------|-----|------|-----|
| CLASS_BATCHSEARCH | Class for Batch Determination | <input type="checkbox"/> | 1 | | 10 |

Entry 1 / 1

Values for Class CLASS_BATCHSEARCH - Object 0000001036

General

| Characteristic Description | Value |
|--------------------------------------|-------|
| Expiration date, shelf life | |
| Remaining Shelf Life for Batch > 1 d | |

Figure 7.34 Selection Criteria

Display OrdType/Plant (YQ01) : Sort Rule

◀ ▶

| Key | | |
|-------|------------|---------------------|
| Plant | Order Type | Description |
| 0100 | ZN01 | Process order (MTS) |

Validity

| | | |
|-----------------|------------|---|
| Validity period | 22.01.2019 | <input type="checkbox"/> |
| To | 31.12.9999 | <input type="checkbox"/> Deletion Indicator |

Sort rule Sort using Shelf Life

Sort sequence

| Characteristic | Description | Asc | De |
|----------------|-----------------------------|-------------------------------------|--------------------------|
| LOBM_VFDAT | Expiration date, shelf life | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Figure 7.35 Sort Rule

Enter Time Ticket for Process Order

Goods Movements | Actual Data

| Order | <input type="text"/> | Material | <input type="text"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|------------------------------|----------------------|--------------------------|------------------------|------------------------|----------|------------------------|------------------------|------|------------------------|------------------------|----------------------|-------|-------|--|--------------------------|----------------------|--|-------|-------|--|-----------------|--------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | Material Descr. | <input type="text"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase | <input type="text"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resource | <input type="text"/> | / Plant | <input type="text"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Confirm.type | Automatic final confirmation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Clear open reservations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th></th> <th>To Be Confirmed</th> <th>Unit</th> <th>Σ Conf. to Date</th> <th>Σ Pl. t/b Conf.</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Yield</td> <td><input type="text"/></td> <td><input type="text"/></td> <td>0.000</td> <td>0.000</td> <td></td> </tr> <tr> <td>Scrap</td> <td><input type="text"/></td> <td></td> <td>0.000</td> <td>0.000</td> <td></td> </tr> <tr> <td>Reason for Var.</td> <td><input type="text"/></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | | | | To Be Confirmed | Unit | Σ Conf. to Date | Σ Pl. t/b Conf. | Unit | Yield | <input type="text"/> | <input type="text"/> | 0.000 | 0.000 | | Scrap | <input type="text"/> | | 0.000 | 0.000 | | Reason for Var. | <input type="text"/> | | | | | | | | | | | | | | | | | | | | | | | | |
| | To Be Confirmed | Unit | Σ Conf. to Date | Σ Pl. t/b Conf. | Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Yield | <input type="text"/> | <input type="text"/> | 0.000 | 0.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Scrap | <input type="text"/> | | 0.000 | 0.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reason for Var. | <input type="text"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Activity</th> <th>To Be Conf.</th> <th>Unit</th> <th>R</th> <th>Σ Conf. to Date</th> <th>Σ Pl. t/b Conf.</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td><input type="checkbox"/></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td><input type="checkbox"/></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | | | | | Activity | To Be Conf. | Unit | R | Σ Conf. to Date | Σ Pl. t/b Conf. | Unit | | | | <input type="checkbox"/> | | | | | | | <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity | To Be Conf. | Unit | R | Σ Conf. to Date | Σ Pl. t/b Conf. | Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 7.36 Time Ticket Confirmation of a Process Order

| Tolerance data | | | | | |
|----------------|-------|---------|------------------------------------|-------|---------|
| Underdely tol. | 0 . 0 | percent | Overdely tol. | 0 . 0 | percent |
| | | | Unlimited <input type="checkbox"/> | | |

Figure 7.37 Underdelivery and Overdelivery Tolerance

Digital Signature Logs

Applicat.

Signature Obj.

Signer

Signature Time

From (Date/Time) 22.09.2021 00:00:00

To (Date/Time) 22.09.2021 23:59:59

Sort Display According to

Signature Object
 Signature Time

Log Class

User locked
 Wrong password, missing SSF info
 Signature process canceled
 Signature executed successfully, signature process completed successfully
 System Error

Batch Record PI Sheet Inspection Lot Object Management Record Engineering Change M...

Material to
Batch to
Plant to

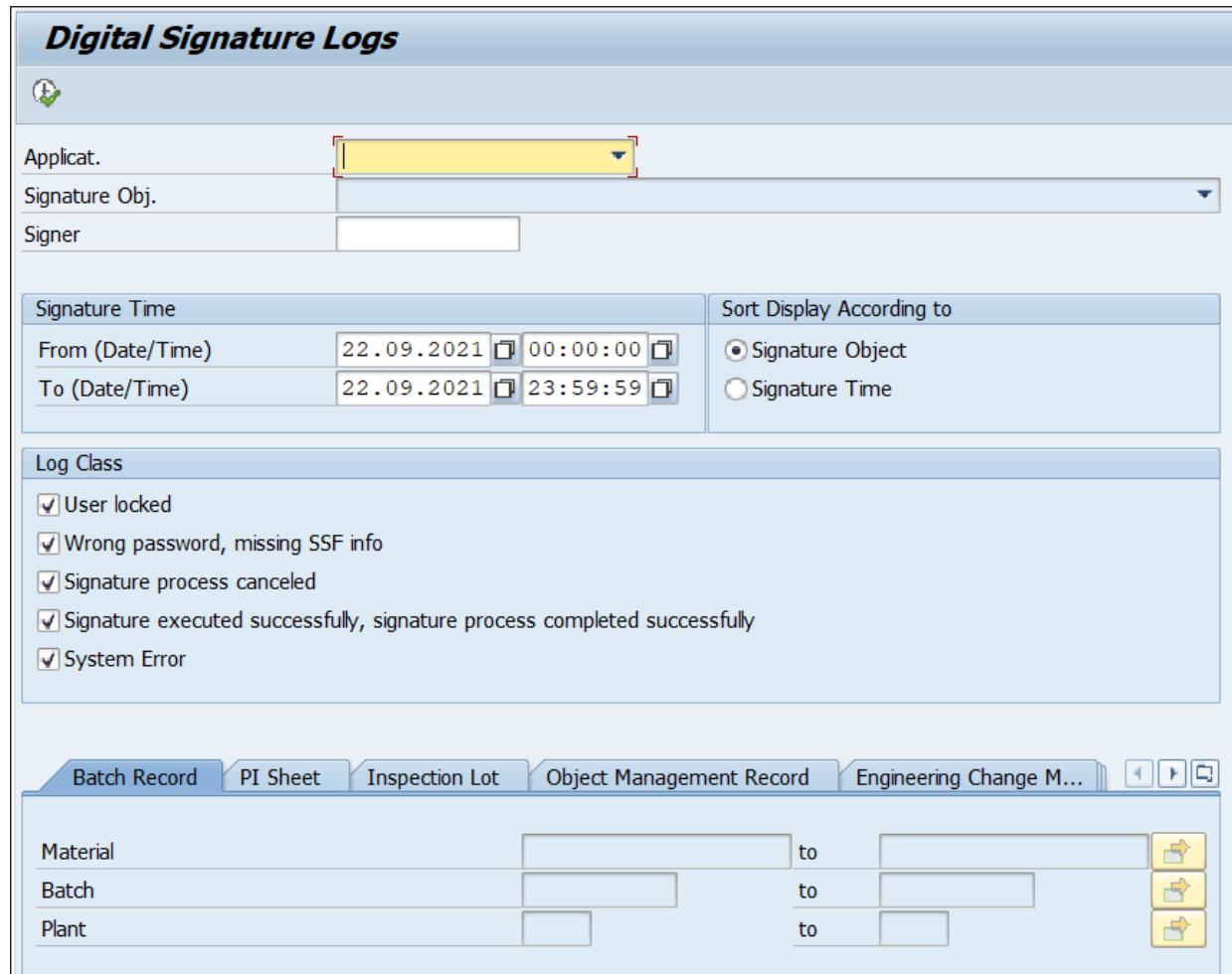


Figure 7.38 Digital Signature Logs

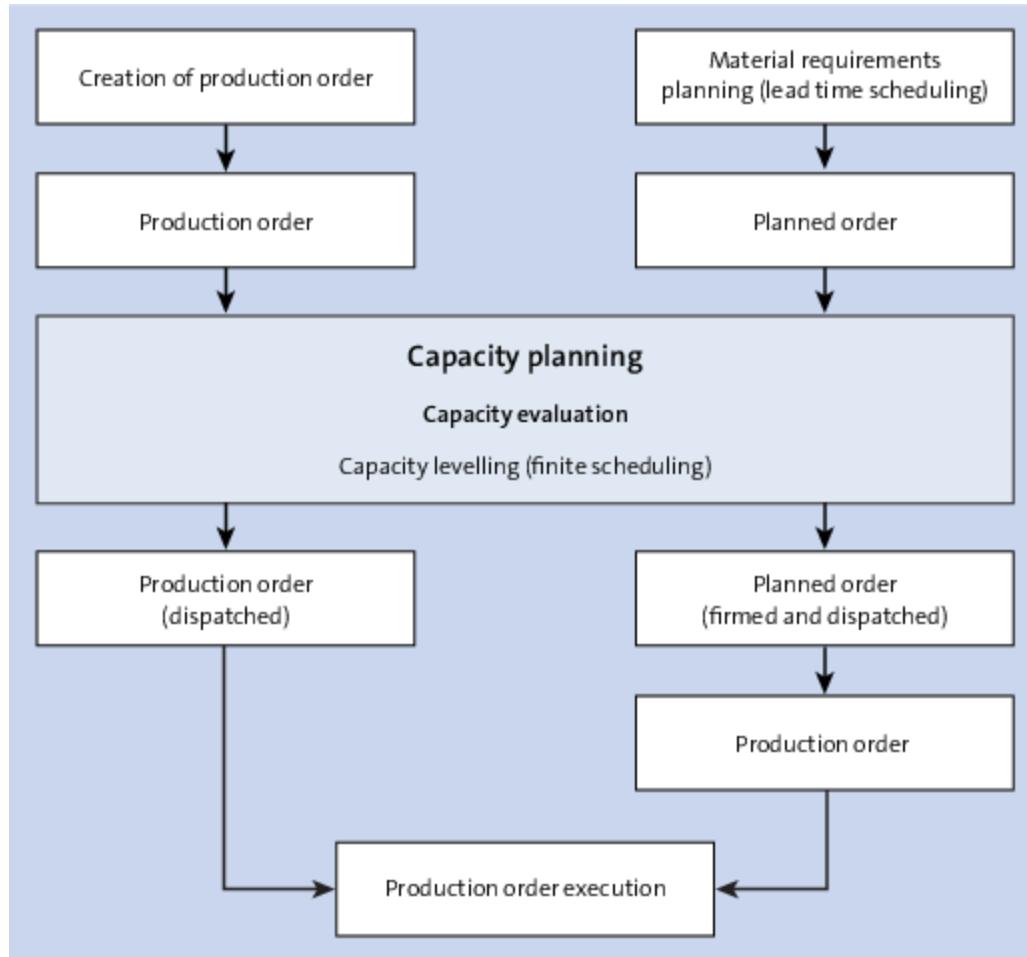


Figure 8.1 Overview of Capacity Planning in SAP S/4HANA

Change Work Center: Capacity Overview

HR assignment Template

| | | |
|-------------|----------|------------|
| Plant | 1710 | Plant 1 US |
| Work center | ASSEMBLY | Assembly |

Basic Data Default Values Capabilities Scheduling Costing Technology Groups

Overview

| Capacity category | 001 | Machine | Control Capacity Reduction |
|--------------------|--------|--------------------|----------------------------|
| Pooled capacity | | Vorschlagkapazität | 0 Formula-Related |
| Setup Formula | SAP005 | Prod: Setup rqmts | 0 Formula-Related |
| Processing Formula | SAP006 | Prod.: Machine rqm | 0 Formula-Related |
| Teardown Formula | | | |
| Other Formula | | | |
| Distribution | SAP060 | | |
| Int. dist. key | | | |

Buttons: Capacity Form. Formula Formula constnts ActCapReqmnts

Figure 8.2 Work Center: Capacities Tab

Change View "Formula Definition": Details

New Entries

Formula key SAP006 [Prod.: Machine rqmts]

Formula

```
SAP_02 * SAP_09 / SAP_08
```

Indicators

Generate PRT Allowed For Reqmts.
 Allowed for Calculation Allowed for Scheduling
 Work Center for Capacity Reqmts.

Search Fld. for Param.

Parameter

Figure 8.3 Formula for Calculating Capacity Requirements

Change Work Center Capacity: Header

Intervals and Shifts Intervals Available Capacity Profile Reference Available Capacity Short Texts

| | | |
|-------------------|----------|------------------|
| Plant | 1710 | Plant 1 US |
| Work center | ASSEMBLY | Assembly |
| Capacity category | 001 | Machine Capacity |

General data

| | | |
|----------------------|--------------------------|-----------------|
| Capacity Responsible | A | Planner Group A |
| Pooled capacity | <input type="checkbox"/> | Grouping |

Available capacity

| | | |
|--------------------|-----|--------|
| Factory Calendar | US | USA |
| Active Version | | |
| Capacity Base Unit | MIN | Minute |

Standard available capacity

| | | | |
|------------------|----------|----------------------|--------|
| Start Time | 07:00:00 | Capacity Utilization | 100 |
| End Time | 16:00:00 | No. Ind. Capacities | 1 |
| Length of breaks | 01:00:00 | Capacity | 480.00 |
| Operating time | 8.00 | | MIN |

Planning details

| | | | |
|-----------------------------------|-------------------------------------|--------------------|-------------------------------------|
| Relevant to Finite Scheduling | <input checked="" type="checkbox"/> | Overload | <input type="text"/> % |
| Can be used by several operations | <input checked="" type="checkbox"/> | Long-term planning | <input checked="" type="checkbox"/> |

Figure 8.4 Work Center: Capacity Header

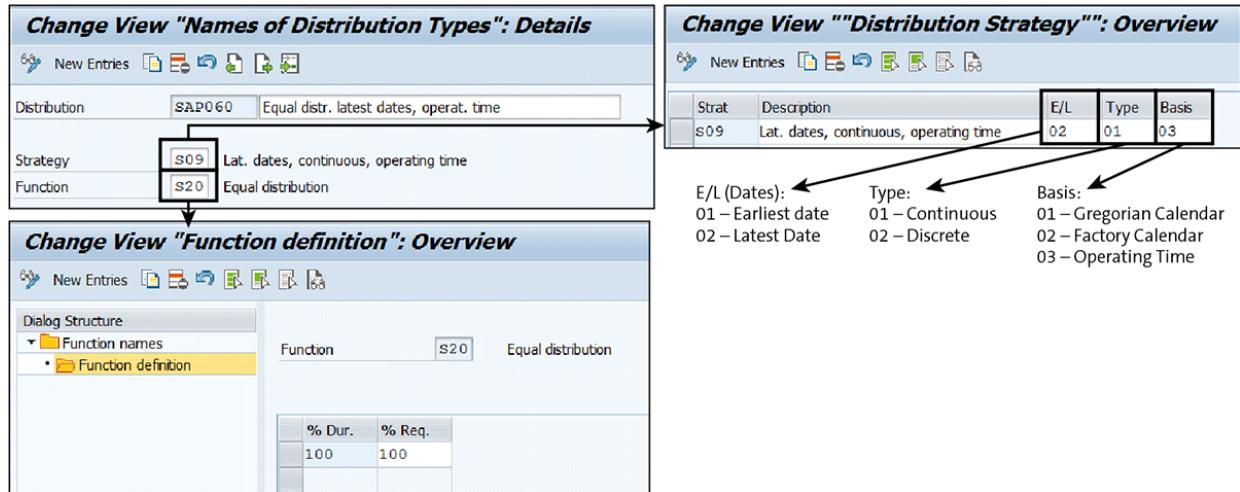


Figure 8.5 Distribution Key

Change View "Control Keys for Operations": Details

New Entries

Control key **YBP1** No Auto GR , Cost , Sched , Print , Conf

Indicator

| | |
|--|--|
| <input checked="" type="checkbox"/> Scheduling | <input checked="" type="checkbox"/> Print Confirmation |
| <input checked="" type="checkbox"/> Det. Cap. Reqmnts | <input checked="" type="checkbox"/> Print |
| <input type="checkbox"/> Insp. Char. Required | <input checked="" type="checkbox"/> Cost |
| <input type="checkbox"/> Automatic GR | <input type="checkbox"/> Sched. External Op. |
| <input checked="" type="checkbox"/> Print Time Tickets | <input type="checkbox"/> Not Relevant for MES |
| <input type="checkbox"/> Rework | |

External Processing Internally processed operation

Confirmations Confirmation required

Figure 8.6 Operation Control Key: Determine Capacity Requirements indicator

Capacity Planning: Selection

Standard overview Detailed cap. list Variable overview

| Operator | |
|------------------------|-----------------|
| Work Center | ASSEMBLY |
| Capacity Planner Group | |
| Plant | 1710 |

Capacity Planning: Standard Overview

Cap. details/period

| Work center | ASSEMBLY | Assembly Vorschlagkapazität | Plant | 1710 | |
|----------------|--------------|--------------------------------|---------|-------------|------|
| Capacity cat.: | 001 | | | | |
| | | | | | |
| Week | Requirements | AvailCap. | CapLoad | RemAvailCap | Unit |
| 44.2021 | 40.60 | 40.00 | 102 % | 0.60- | H |
| 45.2021 | 12.75 | 56.00 | 23 % | 43.25 | H |
| 46.2021 | 4.67 | 56.00 | 8 % | 51.33 | H |
| 47.2021 | 8.83 | 56.00 | 16 % | 47.17 | H |
| 48.2021 | 0.00 | 56.00 | 0 % | 56.00 | H |
| 49.2021 | 0.00 | 56.00 | 0 % | 56.00 | H |
| 50.2021 | 0.00 | 56.00 | 0 % | 56.00 | H |
| 51.2021 | 0.00 | 56.00 | 0 % | 56.00 | H |
| 52.2021 | 0.00 | 56.00 | 0 % | 56.00 | H |
| 01.2022 | 0.00 | 56.00 | 0 % | 56.00 | H |
| Total >>> | 66.85 | 544.00 | 12 % | 477.15 | H |

Figure 8.7 Transaction CM01: Work Center Load Standard Overview

| Capacity Planning: Standard Overview | | | | | | | |
|---|--------------|-----------------------------|---------|-------------|------|-------|------|
|  Cap. details/period | | | | | | | |
| Work center | ASSEMBLY | Assembly Vorschlagkapazität | | | | Plant | 1710 |
| Capacity cat.: | 001 | | | | | | |
| Week | Requirements | AvailCap. | CapLoad | RemAvailCap | Unit | | |
| <input checked="" type="checkbox"/> 44.2021 | 40.60 | 40.00 | 102 % | 0.60- | H | | |
| <input type="checkbox"/> 45.2021 | 12.75 | 56.00 | 23 % | 43.25 | H | | |

| Capacity Planning: Standard Overview: Details | | | | | | | |
|---|----------|-------------|----------|-----------|----------|------------|------------|
|  Order header  Choose fields... Download | | | | | | | |
| Plant | 1710 | Plant 1 US | | | | | |
| Work center | ASSEMBLY | Assembly | | | | | |
| Capacity cat. | 001 | Machine | | | | | |
| Week | P | PeggedRqmt | Material | PgRqmtQty | Reqmts | Earl.start | LatestFin. |
| Total | | | | | 40.600 H | | |
| <input checked="" type="checkbox"/> 44.2021 | 3207 | TS422_FG100 | | 85 PC | 0.642 H | 04.11.2021 | 04.11.2021 |
| <input type="checkbox"/> 44.2021 | 3208 | TS422_FG100 | | 75 PC | 0.625 H | 04.11.2021 | 04.11.2021 |
| <input type="checkbox"/> 44.2021 | 3209 | TS422_FG100 | | 150 PC | 0.750 H | 04.11.2021 | 04.11.2021 |
| <input type="checkbox"/> 44.2021 | 1000401 | TS422_FG101 | | 10 PC | 0.667 H | 02.11.2021 | 02.11.2021 |
| <input type="checkbox"/> 44.2021 | 1000420 | TS422_FG100 | | 100 PC | 0.667 H | 04.11.2021 | 04.11.2021 |
| <input type="checkbox"/> 44.2021 | 1000421 | TS422_FG100 | | 50 PC | 0.583 H | 05.11.2021 | 05.11.2021 |
| <input type="checkbox"/> 44.2021 | 1000422 | TS422_FG100 | | 500 PC | 1.333 H | 05.11.2021 | 05.11.2021 |
| <input type="checkbox"/> 44.2021 | 1000423 | TS422_FG101 | | 500 PC | 8.833 H | 04.11.2021 | 05.11.2021 |
| <input type="checkbox"/> 44.2021 | 1000424 | TS422_FG101 | | 100 PC | 2.167 H | 05.11.2021 | 05.11.2021 |
| <input type="checkbox"/> 44.2021 | 1000425 | TS422_FG101 | | 500 PC | 8.833 H | 06.11.2021 | 07.11.2021 |
| <input type="checkbox"/> 44.2021 | 1000426 | TS422_FG101 | | 900 PC | 15.500 H | 04.11.2021 | 05.11.2021 |

Figure 8.8 Transaction CM01: Work Center Load Detailed Capacity Overview

Change View "Overall Profile": Details

New Entries 

| | | |
|---------------|---------|------------------|
| Overall prof. | SAPX911 | Work center load |
|---------------|---------|------------------|

Subprofiles

| | | |
|----------------|---------|--|
| Sel. profile | SAPA010 | Access via work center |
| Option profile | SAPB020 | Weeks (8) |
| List profile | SAPC010 | Standard overview |
| Graph. profile | SAPD030 | Overview with columns, Gantt latest dat. |

Figure 8.9 Work Center Capacity Evaluation: Overall Profile

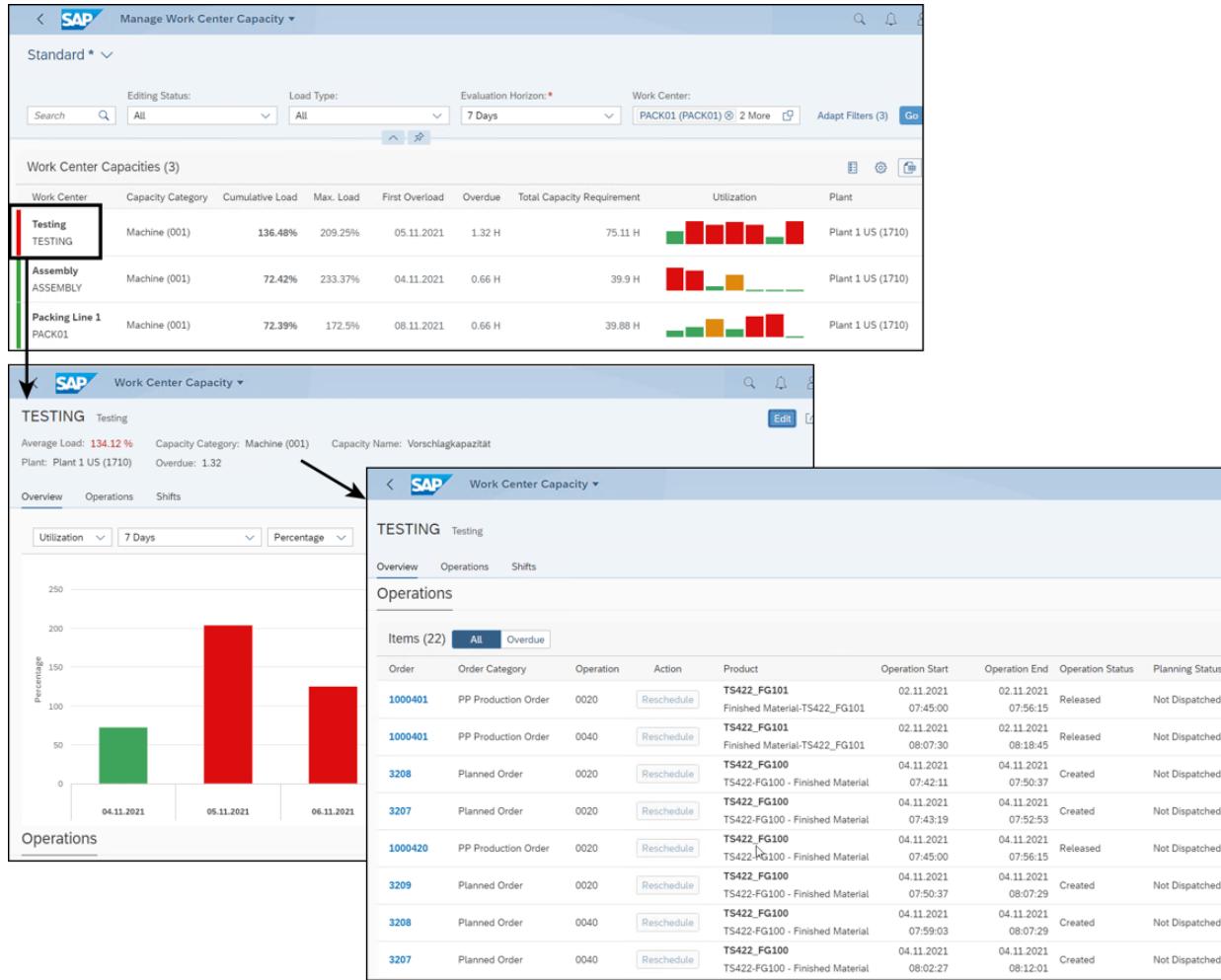


Figure 8.10 Manage Work Center Capacities App

Change View "Capacity Leveling - Overall Profiles": Details

New Entries 

Overall profile SFC: View work center/capacity (3 graf.)

Subprofiles

| | | | |
|----------------------|--|---|---|
| Selection profile | <input type="text" value="SAPSFCS001"/> | SFC: View work center -> cap.(3 graf.) |  |
| Control profile | <input type="text" value="SAP____C002"/> | Gen: Planning table |  |
| Time profile | <input type="text" value="SAP____Z002"/> | Gen: Medium-term (3 months) |  |
| Evaluation Profile | <input type="text" value="SAP____A001"/> | Gen: Standard evaluation profile |  |
| Strategy prof. | <input type="text" value="SAP____T001"/> | Finite scheduling fow./all functs.activ |  |
| Period profile | <input type="text"/> | |  |
| Planning tab.profile | <input type="text" value="SAPSFCL010"/> | SFC: only main cap. (3 graf.) |  |
| Prof. pln.tab. (tab) | <input type="text"/> | |  |
| List profile | <input type="text" value="SAPSFCI001"/> | SFC: Production planning |  |

Figure 8.11 Capacity Leveling: Overall Profile

Change View "Capacity Leveling - Strategy Profiles": Details

New Entries

Strategy prof. SAP_T001 Finite scheduling forw./all functs.activ

| Scheduling control | | Period split | | | | | | | | | | |
|--|--|---|--------|-------------------------------------|--|-------------------------------------|----------------------|--------------------------|------------------------------------|-------------------------------------|---------------------|--|
| <input checked="" type="checkbox"/> Finite scheduling <input type="checkbox"/> Dispatch at earliest point in time <input type="checkbox"/> Dispatch at best time for setup <input type="checkbox"/> Date entry when dispatching <input checked="" type="checkbox"/> Plan. direction forwards <input type="checkbox"/> Change planning direction <input type="checkbox"/> Planning in non-work periods <input type="checkbox"/> Insert operation Close gaps <input type="checkbox"/> No closing of the gaps | | PerSplit <input type="checkbox"/> without <input type="checkbox"/> Start search in plan.direction <input type="checkbox"/> Always adhere to period split <input type="checkbox"/> Op.compl.in period split | | | | | | | | | | |
| | | Queue time | | | | | | | | | | |
| | | Treatment of queue time <input type="checkbox"/> 1 After reduc... Reduction level <input type="checkbox"/> 1 | | | | | | | | | | |
| Further control options | | | | | | | | | | | | |
| <input type="checkbox"/> Overall capacity load <input type="checkbox"/> Reschedule with prod.version Dispatch. sequence SAPSFCSS31 Sort. order: lat.start/seq.no./prio Dispatch internal production <input type="checkbox"/> 2 Latest start date Initial setup state | | | | | | | | | | | | |
| Dispatching functions | | Checks | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>A...</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/></td> <td>Consider operation sequence in the order</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Operation date check</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Change production version on error</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Midpoint scheduling</td> </tr> </tbody> </table> | | A... | Action | <input checked="" type="checkbox"/> | Consider operation sequence in the order | <input checked="" type="checkbox"/> | Operation date check | <input type="checkbox"/> | Change production version on error | <input checked="" type="checkbox"/> | Midpoint scheduling | <input type="checkbox"/> Cancel dispatching due to error <input type="checkbox"/> Term.resched with prod.version <input type="checkbox"/> Use operation floats <input type="checkbox"/> Use float bef. prod. <input type="checkbox"/> Use float aft. prod. |
| A... | Action | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | Consider operation sequence in the order | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | Operation date check | | | | | | | | | | | |
| <input type="checkbox"/> | Change production version on error | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | Midpoint scheduling | | | | | | | | | | | |

Figure 8.12 Capacity Leveling: Strategy Profile

Period Requirements per Resource

| | | Work ctr Cap.ca | | 07.11.2021 | | 08.11.2021 | | 09.11.2021 | | 10.11.2021 | | 11.11.2021 | |
|--------------------------|----------|-----------------|-----|------------|-----|------------|-----|------------|-----|------------|-----|------------|----|
| <input type="checkbox"/> | ASSEMBLY | 001 | ... | 60.0 | 88 | 480.0 | 0 | 480.0 | 0 | 480.0 | 0 | 330.0 | 31 |
| <input type="checkbox"/> | PACK01 | 001 | ... | 291.6 | 39 | 58.4- | 112 | 348.6- | 173 | 480.0 | 0 | 480.0 | 0 |
| <input type="checkbox"/> | TESTING | 001 | ... | 400.0- | 183 | 103.0- | 121 | 303.8 | 37 | 524.8- | 209 | 201.0 | 58 |

Requirements

| Tot.req | Spl | Material | Prio | Order | Op. | Work ctr | Cap | Operation | qua | Rem.se... |
|---------|-----|----------|------|---------|------|----------|-----|-----------|---------|-----------|
| 930.0 | 0 | TS422_FG | | 1000426 | 0020 | TESTING | 001 | 900.000 | 30.0... | |
| 530.0 | 0 | TS422_FG | | 1000423 | 0030 | PACK01 | 001 | 500.000 | 30.0... | |
| 530.0 | 0 | TS422_FG | | 1000425 | 0010 | ASSEMBLY | 001 | 500.000 | 30.0... | |
| 530.0 | 0 | TS422_FG | | 1000423 | 0040 | TESTING | 001 | 500.000 | 30.0... | |
| 930.0 | 0 | TS422_FG | | 1000426 | 0030 | PACK01 | 001 | 900.000 | 30.0... | |
| 530.0 | 0 | TS422_FG | | 1000425 | 0020 | TESTING | 001 | 500.000 | 30.0... | |
| 530.0 | 0 | TS422_FG | | 1000425 | 0030 | PACK01 | 001 | 500.000 | 30.0... | |
| 930.0 | 0 | TS422_FG | | 1000426 | 0040 | TESTING | 001 | 900.000 | 30.0... | |
| 530.0 | 0 | TS422_FG | | 1000425 | 0040 | TESTING | 001 | 500.000 | 30.0... | |
| 660.0 | 0 | TS422_FG | | 3201 | 0010 | ASSEMBLY | 001 | 630.000 | 30.0... | |
| 660.0 | 0 | TS422_FG | | 3201 | 0020 | TESTING | 001 | 630.000 | 30.0... | |
| 105.0 | 0 | TS422_FG | | 3204 | 0010 | ASSEMBLY | 001 | 750.000 | 30.0... | |
| 660.0 | 0 | TS422_FG | | 3201 | 0030 | PACK01 | 001 | 630.000 | 30.0... | |
| 105.0 | 0 | TS422_FG | | 3204 | 0020 | TESTING | 001 | 750.000 | 30.0... | |
| 105.0 | 0 | TS422_FG | | 3204 | 0030 | PACK01 | 001 | 750.000 | 30.0... | |

Figure 8.13 Tabular Capacity Planning Table

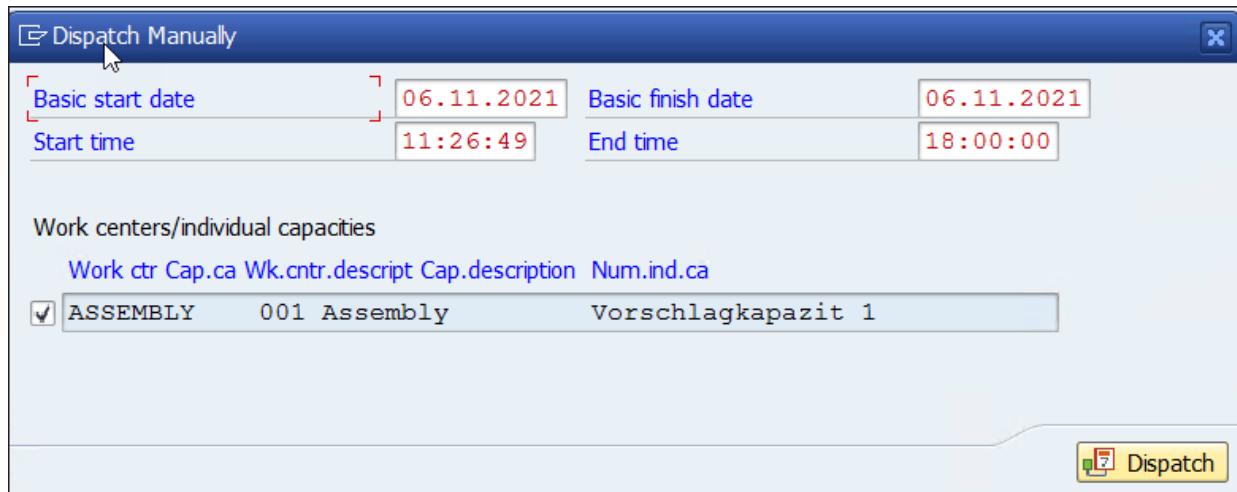


Figure 8.14 Manual Dispatch in the Tabular Capacity Planning Table

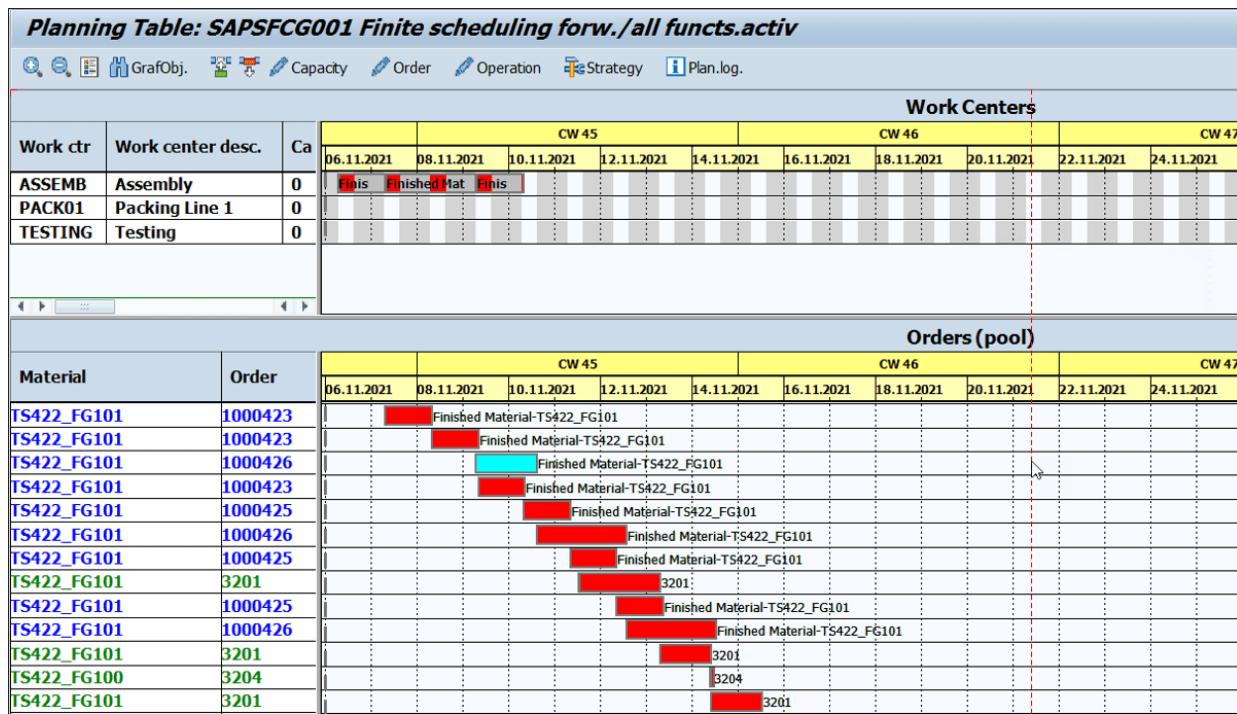


Figure 8.15 Graphical Capacity Planning Table

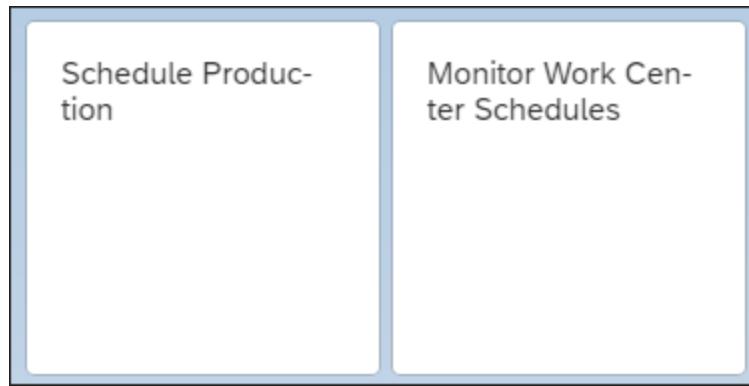


Figure 8.16 Capacity Leveling SAP Fiori Apps

Schedule Production

Standard * ▾

Horizon: * dd.MM.yyyy - dd.MM.yyyy

Work Centres

Search

Product:

Status:

This app works in simulation mode. To save all changes to the system, choose Save.

Orders (0)

Realign Schedules Dispatch Deallocate

Requirement Date

To start, set the relevant filters.

Save Cancel

Siva Kumar Mutnuru

Recent Activities

Frequently Used

App Finder

Settings

About

App Settings

Sign Out

App Settings

Area of Responsibility

Industry Type

Process

Discrete

Color-code Capacity Required OFF

OK

Industry Type

OK Cancel

My Area of Responsibility

Standard * ▾

AOR Status:

Plant:

Search

MRP Controller:

Adapt Filters Go

Plant / MRP Controller Combinations (707)

Assign Unassign

Plant Plant Name MRP Controller MRP Controller Name AOR Status

1710 Plant 1 US 001 MRP Controller 001 ✓ ○

1710 Plant 1 US 002 MRP Controller 002 ✓ ○

Figure 8.17 Schedule Production App: Initial App Settings

Change Material TS422_FG101 (Finished Product)

The screenshot shows the SAP Change Material interface for material TS422_FG101. The main window displays basic material information (Material: TS422_FG101, Descr.: Finished Material, Plant: 1710, Stor. Loc.: 171A) and various configuration tabs like MRP 3, MRP 4, and Production Version Overview. A dialog box titled 'Production Version Details' is open, showing details for Production Version 0001 ('Prod. version 1'). The dialog includes sections for Basic data (Prod. Vers. locked: Not locked, Minimum Lot Size: 1.000, Valid from: 20.01.2021), Planning data (Task List Type: N Routing, Group: 41710000, Group Counter: 2), Bill of material (Alternative BOM: 1, BOM Usage: 1), Repetitive Manufacturing (Production Line: ASSEMBLY), and Other data (Issue stor. Location, Receiving Location, Warehouse Number, Destination Bin, OB Reference Mat., Default Supply Area). Buttons at the bottom of the dialog include Continue, Previous Version, Next Version, and Cancel.

Change Routing: Operation Overview

The screenshot shows the SAP Change Routing: Operation Overview screen. It displays a table of operations for group 41710000, material TS422_FG101. The table has columns for Op..., SOP, Work cen..., Plant, Co..., Standard ..., Description, L..., PRT, and O... (partially visible). The first row (Op0010) is highlighted and shows 'ASSEMBLY' under 'Description'. Other rows include 'TESTING', 'PACK01', 'TESTING', 'Posting GR (with opt. SerialNo assignm.)', and several blank rows. Navigation icons and tabs like Reference, Work center, Allocation, Detail, Sequences, PRT, and Insp are visible at the top.

| Op... | SOP | Work cen... | Plant | Co... | Standard ... | Description | L... | PRT | O... |
|-------|-----|-------------|-------|-------|--------------|--|------|-----|------|
| 0010 | | ASSEMBLY | 1710 | YBPI | | Assembly | | | |
| 0020 | | TESTING | 1710 | YBPI | | Final Acceptance | | | |
| 0030 | | PACK01 | 1710 | YBPI | | Packaging | | | |
| 0040 | | TESTING | 1710 | YBPI | | Posting GR (with opt. SerialNo assignm.) | | | |
| 0050 | | | 1710 | | | | | | |
| 0060 | | | 1710 | | | | | | |
| 0070 | | | 1710 | | | | | | |

Figure 8.18 Pacemaker Work Center for the Schedule Production App

This app works in simulation mode. To save all changes to the system, choose Save.

| Order | Product | Quantity | Source of Supply | Requirement Date | Receipt Date | Work Center | Operation | Action | Operation End | Capacity Required | Status |
|---|--|----------|--|------------------------|------------------------|--------------------------|-----------|------------|------------------------|-------------------|------------------|
| <input type="checkbox"/> 1000424 Production Order | TS422_FG101 Finished Material-TS422_FG101 | 100 PC | Production Version (0001) Prod. version 1 | 14.11.2021 00:00:00 | 05.11.2021 10:22:30 | ASSEMBLY Assembly | 0010 | Reschedule | 05.11.2021 10:22:30 | 2.17 H | Not Dispatched > |
| <input checked="" type="checkbox"/> 1000422 Production Order | TS422_FG100 TS422-FG100 - Finished Material | 500 PC | Production Version (0001) Prod. version 1 | 11.11.2021 00:00:00 | 05.11.2021 15:03:45 | PACK01 Packing Line 1 | 0030 | Reschedule | 05.11.2021 15:03:45 | 1.33 H | Not Dispatched > |
| <input type="checkbox"/> 1000421 Production Order | TS422_FG100 TS422-FG100 - Finished Material | 50 PC | Production Version (0001) Prod. version 1 | 11.11.2021 00:00:00 | 05.11.2021 15:54:23 | PACK01 Packing Line 1 | 0030 | Reschedule | 05.11.2021 15:54:23 | 0.58 H | Not Dispatched > |
| <input type="checkbox"/> 1000423 Production Order | TS422_FG101 Finished Material-TS422_FG101 | 500 PC | Production Version (0001) Prod. version 1 | 14.11.2021 00:00:00 | 07.11.2021 07:56:15 | ASSEMBLY Assembly | 0010 | Reschedule | 07.11.2021 07:56:15 | 8.83 H | Dispatched > |
| <input type="checkbox"/> 1000426 Production Order | TS422_FG101 Finished Material-TS422_FG101 | 900 PC | Production Version (0001) Prod. version 1 | 17.11.2021 00:00:00 | 09.11.2021 07:22:30 | ASSEMBLY Assembly | 0010 | Reschedule | 09.11.2021 07:22:30 | 15.50 H | Dispatched > |

Figure 8.19 Schedule Production App: Dispatch of Planned and Production Orders

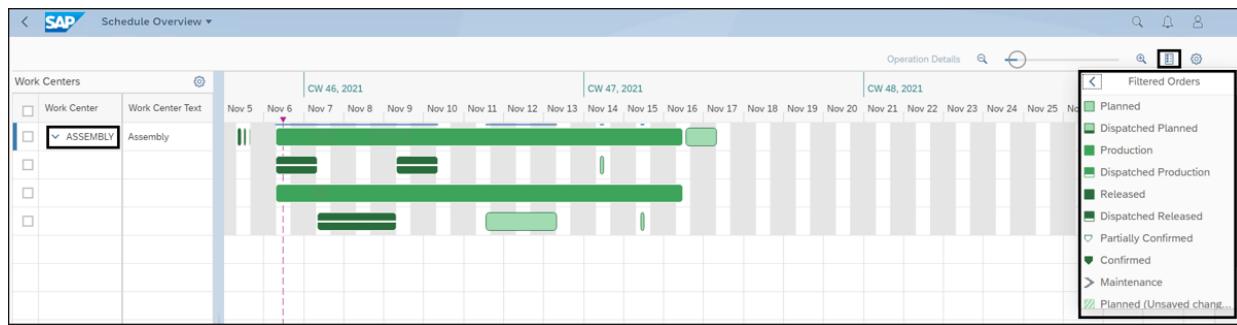


Figure 8.20 Schedule Overview: Chart View

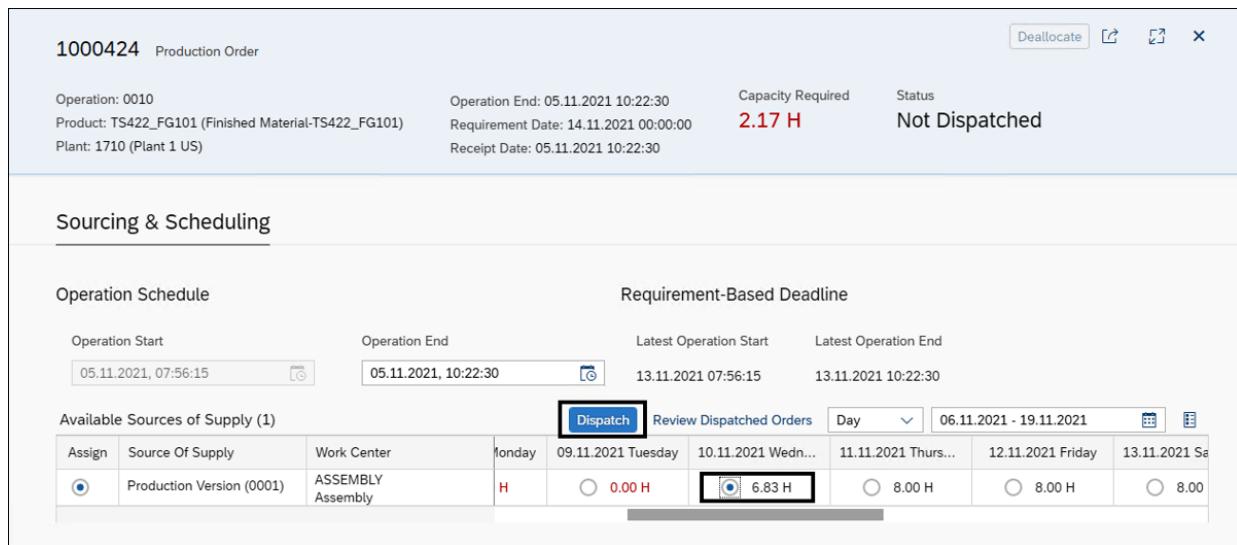


Figure 8.21 Schedule Overview: Detailed Operation Information

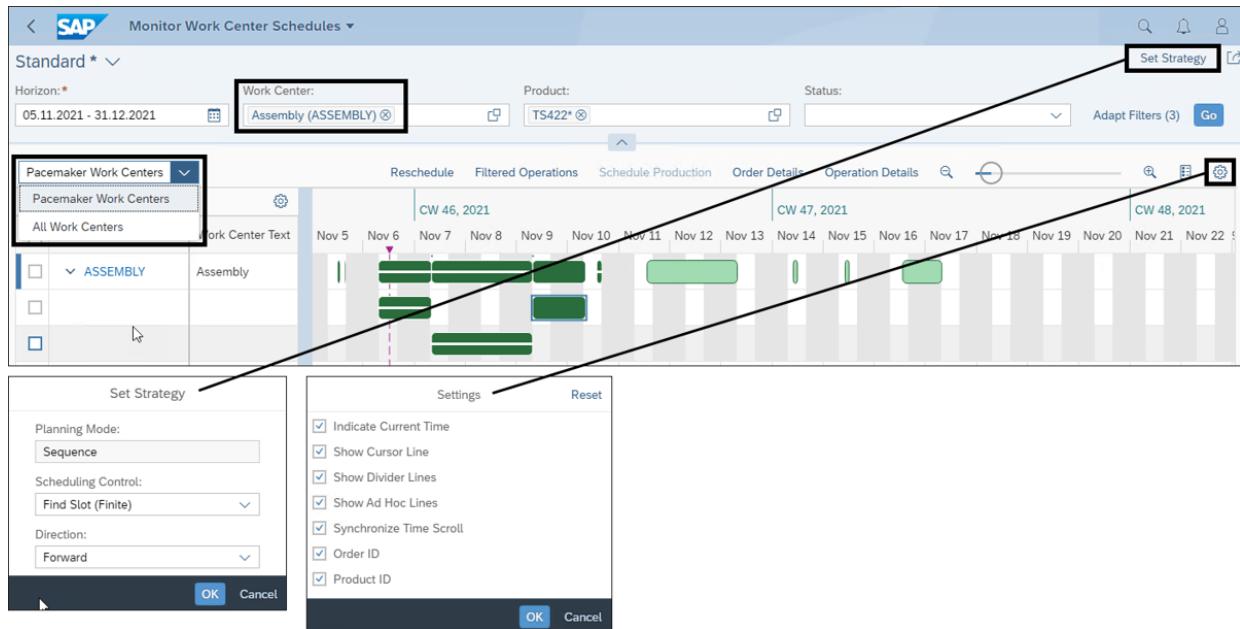


Figure 8.22 Monitor Work Center Schedules App

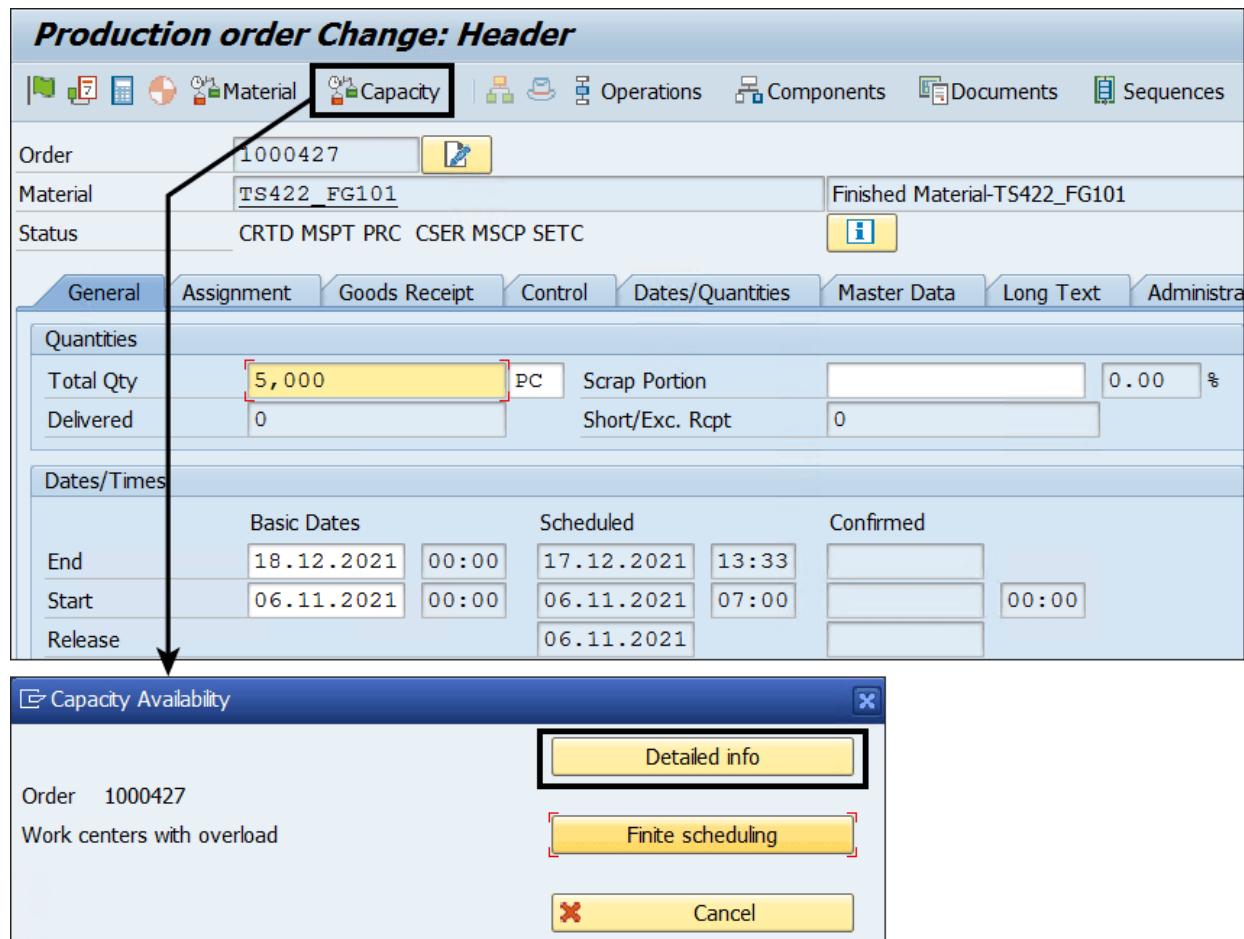


Figure 8.23 Capacity Availability Check in a Production Order

Capacities with Overload

Capacity Availability

Order 1000427 Cat. YBM1 Plant 1710
 Material TS422_FG101 Finished Material-TS422_F
 MRP controller 001
 System status CRTD MSPT PRC CSER MSCP SETC

Operation 0010
 Capacity confirmed
 Work center ASSEMBLY Assembly
 Capacity category 001 Machine Load threshold 100 %

| Period | Availability | Requirements | Rqmts.order | CapLoad | Un. |
|---------|--------------|--------------|-------------|---------|-----|
| 44.2021 | 3,360.00 | 1,754.55 | 914.55 | 52.2 % | MIN |
| 45.2021 | 3,360.00 | 4,350.91 | 3,200.91 | 129.5 % | MIN |
| 46.2021 | 3,360.00 | 914.55 | 914.55 | 27.2 % | MIN |

Operation 0020
 Capacity confirmed
 Work center TESTING Testing
 Capacity category 001 Machine Load threshold 100 %

| Period | Availability | Requirements | Rqmts.order | CapLoad | Un. |
|---------|--------------|--------------|-------------|---------|-----|
| 46.2021 | 3,360.00 | 2,743.64 | 2,743.64 | 81.7 % | MIN |
| 47.2021 | 3,360.00 | 2,286.36 | 2,286.36 | 68.0 % | MIN |

Operation 0030
 Capacity confirmed
 Work center PACK01 Packing Line 1
 Capacity category 001 Machine Load threshold 100 %

| Period | Availability | Requirements | Rqmts.order | CapLoad | Un. |
|--------|--------------|--------------|-------------|---------|-----|
| | | | | | |

Figure 8.24 Capacities with Overload

Change View "Order control": Details

New Entries

| | | |
|--------------------|------|--|
| Plant | 1710 | Plant 1 US |
| Order Type | YBM1 | MTS Production Order |
| Availability Check | 1 | Check availability during order creation |

Material availability

No check
 Check material availability when saving order

| | | |
|----------------------|----|----------------------------|
| Checking Rule | P2 | Production: Order Creation |
| Component Check Type | | ATP check |

Collect. conversion 2 Creation even though no material is available

PRT availability

No check

| | |
|---------------------|--|
| Checking Rule | |
| Collect. conversion | |

Capacity availability

No check

| | | |
|---------------------|------------|---|
| Overall profile | SAPSFCG013 | SFC:Capacity availability check >= 3.0D |
| Collect. conversion | 2 | Creation even though no capacity is available |

Figure 8.25 Check Control for Capacity Availability Check

Change View "Production Scheduling Profile": Details

New Entries

| | | |
|----------------------|--------|------------------------------|
| Plant | 1710 | Plant 1 US |
| Prod. Sched. Profile | YB0001 | MTS - FG - Pod. Sch. Profile |

Capacity Planning

Leveling

Overall Profile SAPSF CG011

Availability Check

Confirm Capacity Finite Scheduling

Figure 8.26 Production Scheduling Profile

| Firming | |
|---------------------|-------------------------------------|
| Planned Order | <input checked="" type="checkbox"/> |
| Components | <input type="checkbox"/> |
| Capacity Dispatched | <input checked="" type="checkbox"/> |

Figure 8.27 Planned Order: Firming and Capacity Dispatched indicators

Create Integration Model

| General Selection Options for Materials | |
|---|-------|
| Material | R-301 |
| Plnt | 1710 |
| Matl Type | |
| PlantSpec. Mtl Stat | |
| MRP Ctrlr | |
| MRP Type | |
| ABC Indicator | |
| Warehouse Number | |

| Selection of Source of Supply | |
|---|-------|
| <input checked="" type="checkbox"/> Material-Dependent Source of Supply Selection | |
| <input type="checkbox"/> Include Dependent Vendors and Issuing Plants | |
| Vendor | |
| Create Loc./BP | |
| Material | R-301 |
| Supplying Plant | |

| Selection of Purchasing Info Record | |
|--|--|
| Vendor | |
| Material | |
| Purch. Org | |
| Plnt | |
| Info Rec. No. | |
| <input type="checkbox"/> Standard Info Record | |
| <input type="checkbox"/> Consignment Info Record | |

Figure 9.1 Create Integration Model

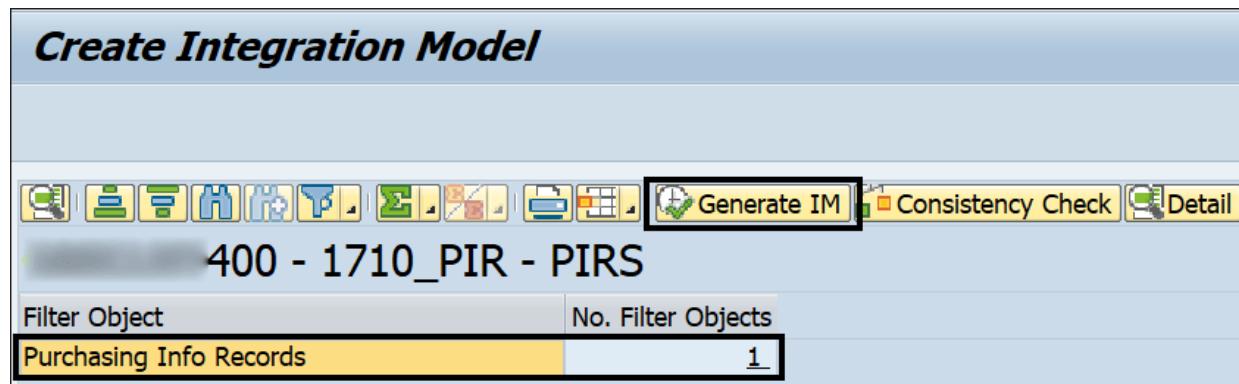


Figure 9.2 Generate Integration Model

Activate or Deactivate Integration Model



| | | | |
|--------------------|----------|----|----------------------|
| Selection Criteria | | | |
| Model | 1710_PIR | to | <input type="text"/> |
| Logical System | 400 | to | <input type="text"/> |
| APO Application | PIRS | to | <input type="text"/> |

Special CIF Settings

Log Deactivated Material Masters
 Do Not Issue Warning in Case of Parallel CIF Load

Parallelized Transfer

Parallelize Selection in ERP System
 Absolute Max. No. Processes
 Relative Max. No. Processes

| | |
|----------------------|----------------|
| <input type="text"/> | Processes |
| <input type="text"/> | % of Processes |

Server Group
 Parallelize Processing in APO

PP/DS and SNP Planned Orders

Create Planned Orders as SNP Planned Orders

Figure 9.3 Activate Integration Model

The screenshot shows two consecutive screenshots of an SAP Fiori application titled "Activate or Deactivate Integration Model".

Screenshot 1 (Top):

- Left Panel:** Shows the navigation tree under "Integration Models" with a folder named "400" expanded, containing a subfolder "1710_PIR" which has a file named "PIRS".
- Right Panel:** A table titled "400 - 1710_PIR - PIRS" with the following columns: Created On, Changed At, Created By, Prev. Status, and New Status.
- Actions:** A toolbar at the top includes icons for Start, Active/Inactive, and Check.

| Created On | Changed At | Created By | Prev. Status | New Status |
|------------|------------|------------|--------------|------------|
| 30.11.2021 | 10:53:50 | | ✗ | ✗ |
| 15.07.2021 | 11:24:39 | | ✗ | ✗ |
| 23.06.2021 | 17:00:04 | | ✓ | ✓ |

Screenshot 2 (Bottom):

- Left Panel:** Same navigation tree as the first screenshot.
- Right Panel:** The same table and toolbar, but the "Start" button in the toolbar is highlighted with a black box and an arrow points from the top screenshot to it.
- Actions:** A toolbar at the top includes icons for Start, Active/Inactive, and Check.

| Created On | Changed At | Created By | Prev. Status | New Status |
|------------|------------|------------|--------------|------------|
| 30.11.2021 | 10:53:50 | | ✗ | ✓ |
| 15.07.2021 | 11:24:39 | | ✗ | ✗ |
| 23.06.2021 | 17:00:04 | | ✓ | ✗ |

Figure 9.4 Activate and Start Integration Model

Create locations for business partners, plants and shipping points

| | | | |
|-----------------------------|----------------------|----|----------------------|
| Business Partner | | | |
| Business Partner | BP1710 | to | <input type="text"/> |
| Category | <input type="text"/> | to | |
| Role | <input type="text"/> | to | |
| Country | <input type="text"/> | to | |
| Plant | | | |
| Plant | 1710 | to | |
| Shipping/Receiving Point | | | |
| Shipping Point/Receiving Pt | <input type="text"/> | to | |
| Country | <input type="text"/> | to | |
| MRP Area | | | |
| MRP Area | <input type="text"/> | to | |

Figure 9.5 Create Locations for Business Partners, Plants, and Shipping Points in Embedded PP-DS

Change Location 1710

| | | |
|--|--|------------------|
| Location | 1710 | Plant 1 US |
| Location Type | 1001 | Production Plant |
| Planning Version | 000 | Active Version |
| Gene... Address Alt. Identifiers Calendar Resources Addit. | | |
| Handling Resources | | |
| Resource Inbound | <input style="width: 150px; height: 20px;" type="button" value="..."/> | |
| Resource Outbound | <input style="width: 150px; height: 20px;" type="button" value="..."/> | |
| Storage Resource | | |
| Storage Resource | <input style="width: 150px; height: 20px;" type="button" value="..."/> | |

Figure 9.6 Change Location Master in Embedded PP-DS:
Transaction /SAPAPO/LOC3

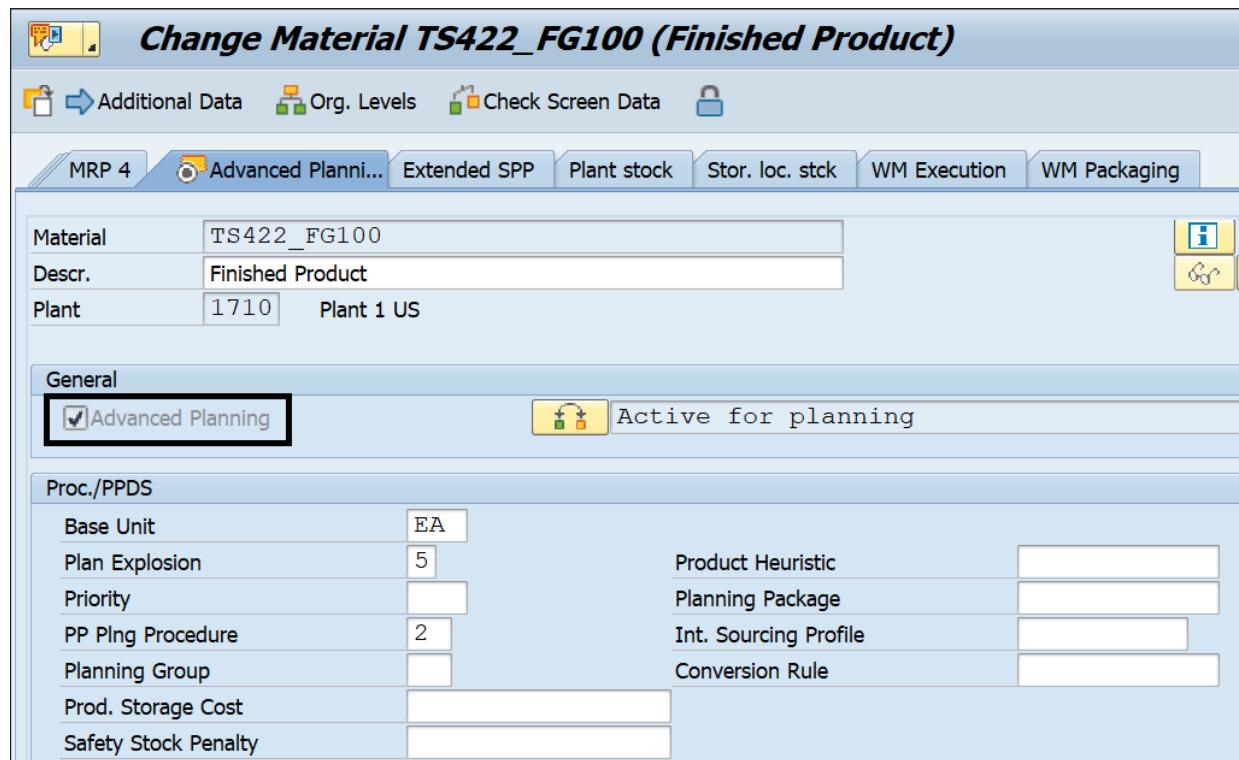


Figure 9.7 Activate Advanced Planning in Material Master:
Transaction MM01

Change Material TS422_FG100 (Finished Product)

Additional Data Org. Levels Check Screen Data

MRP 4 Advanced Plann... Extended SPP Plant stock Stor. loc. stck WM Execution WM Packaging

| | | |
|----------|------------------|------------|
| Material | TS422_FG100 | |
| Descr. | Finished Product | |
| Plant | 1710 | Plant 1 US |

General

Advanced Planning Active for planning

Proc./PPDS

| | |
|----------------------|----|
| Base Unit | EA |
| Plan Explosion | 5 |
| Priority | |
| PP Plng Procedure | 2 |
| Planning Group | |
| Prod. Storage Cost | |
| Safety Stock Penalty | |

| | |
|-----------------------|--|
| Product Heuristic | |
| Planning Package | |
| Int. Sourcing Profile | |
| Conversion Rule | |

Demand

| | | | |
|-------------------------------|--------------------------|--------------------|--------------------------|
| Avoid Alerts | <input type="checkbox"/> | Fixed Pegging | <input type="checkbox"/> |
| Pegging Strategy | <input type="checkbox"/> | Proposed Strategy | 20 |
| Min Passing Amt | | Use Quantity | <input type="checkbox"/> |
| Alert Threshold for Earliness | | Use Total Receipts | <input type="checkbox"/> |
| Alert Threshold for Lateness | | Use Total Stock | <input type="checkbox"/> |
| Res. Network Name | | | |
| Product Alerts | | | |

Lot Size

| | |
|-------------------------|--|
| Lot Size Unit | |
| Target Day's Supply | |
| Planning Calendar | |
| Reorder Day's Supply | |
| Replenishment Lead Time | |

GR/GI

| | | | |
|-------------------|--|----------------------|--|
| GR Processng Time | | GR Handlg Cap. Cons. | |
| GI Processng Time | | GI Handlg Cap. Cons. | |

Location Dependent Shelf-Life

| | |
|-----------------|--------------------------|
| Shelf Life(Loc) | <input type="checkbox"/> |
| Loc. Shelf Life | |
| Loc. Matur.Time | |
| Min. Shelf Life | |
| Max. Shelf Life | |

Figure 9.8 Maintain Additional Fields in Advanced Planning
View of the Material Master

Display Product TS422_FG100 for Location 1710

The screenshot shows the SAP S/4HANA Demand and PP/DS View interface. At the top, there are fields for Product (TS422_FG100), Base Unit (EA), and Location (1710, Plant 1 US). Below this is a toolbar with tabs: Properties 2, Units of Meas., Additional GTINs/EANs, Classification, Pkg Data, Storage, Demands, and Lot Sizes. The main area is titled "Requirement Profile" and contains tabs for Reqmt Profile, Requirement Status, Pegging, Available Stocks, and Demand Penalties. Under "Requirement Status", the "Proposed Strategy" is set to 20 and the "PLANNING WITH FINAL ASSEMBLY" checkbox is checked. The "Dependent Requirements" section includes radio buttons for "Always Coll. Requirement" (selected) and "Possible Indiv. Cust. Reqt". To the right, there is a "Consumption" section with fields for Consumption Mode (2), Bwd Consumption Per. (15), and Fwd Consumption Per. (15). A checkbox for "Assembly Planning" is also present. At the bottom, there is an "Alert Filter" section with a dropdown menu set to "Determine Direct Alerts, Relevant to Network Alerts".

Figure 9.9 Demand and PP/DS Views in the Embedded PP-DS Product Master

Change Work Center: Basic Data

HR assignment Template

| | | |
|-------------|---------|----------------|
| Plant | 1710 | Plant 1 US |
| Work center | 1710_FA | Packaging line |

Basic D... Default Values Capacities Scheduling Costing Groups

General Data

| | | |
|----------------------|--------------------------|---|
| Work Center Category | 0007 | Production line |
| Person Responsible | | |
| Location | | |
| QDR System | | |
| Supply Area | | |
| Usage | 009 | All task list types |
| Backflush | <input type="checkbox"/> | Advanced Planning <input checked="" type="checkbox"/> |
| Shift Note Type | <input type="checkbox"/> | |

Standard Value Maintenance

| Standard Value Key | SAP1 | Normal production | |
|---------------------------------|-----------------|----------------------------------|-------------|
| Standard Values Overview | | | |
| Key Word | Rule for Maint. | Ke... | Description |
| Setup | no checking | <input type="button" value="▼"/> | |
| Machine | no checking | <input type="button" value="▼"/> | |
| Labor | no checking | <input type="button" value="▼"/> | |

Figure 9.10 Activate Work Center for Advanced Planning

Change Work Center Capacity: Header

APO Resource tab selected.

| | | |
|-------------------|---------|-------------------|
| Plant | 1710 | Plant 1 US |
| Work center | 1710 FA | Packaging line |
| Capacity category | 001 | Packaging machine |

General data

| | | |
|----------------------|--------------------------|-----------------------------------|
| Capacity Responsible | A | Planner Group A |
| Pooled capacity | <input type="checkbox"/> | Grouping <input type="checkbox"/> |

Available capacity

| | | |
|--------------------|----|---------------------------------|
| Factory Calendar | W8 | Germany - All days are workdays |
| Active Version | 1 | Normal available capacity |
| Capacity Base Unit | H | Hour |

Standard available capacity

| | | | |
|------------------|----------|----------------------|-------|
| Start Time | 00:00:01 | Capacity Utilization | 100 |
| End Time | 23:59:59 | No. Ind. Capacities | 1 |
| Length of breaks | 01:00:00 | Capacity | 23,00 |
| Operating time | 23,00 | | |

Planning details

| | | |
|-----------------------------------|-------------------------------------|--|
| Relevant to Finite Scheduling | <input checked="" type="checkbox"/> | Overload <input type="checkbox"/> % |
| Can be used by several operations | <input checked="" type="checkbox"/> | Long-term planning <input checked="" type="checkbox"/> |

Header Data for APO Resource

| | |
|---------------|------------------------|
| Resource Type | Multiactivity Resource |
| Resource Cat. | Production |

Time-Oriented

| | | | |
|------------------|----------|----------------------|-----|
| Start Time | 00:00:01 | No. Ind. Capacities | 1 |
| End Time | 23:59:59 | Capacity Utilization | 100 |
| Length of breaks | 01:00:00 | | |

PP/DS Bucket Capacity

| | |
|-------------------|--------------------------------|
| Bucket Definition | No PP/DS Available Bucket C... |
| Bucket Schema | 0 |
| Bucket Factor | 0 |
| Finite Capacity | Time-Continuous Capacity |

Bucket-Oriented

| | |
|---------------------|--------------------------|
| Bucket Definition | <input type="checkbox"/> |
| Bucket Capacity | 0,000 |
| Number of Periods | 0 |
| Period Type | 0 |
| Loss Factor in % | 0 |
| Utiliz. Rate Bckt % | 0,000 |

Figure 9.11 Work Center Creation and Maintenance of the APO Resource Tab with Transaction CR01

Display Resources: Header Data - Model-Independent

The screenshot shows the SAP Resource Master View. At the top, there is a toolbar with various icons for file operations like New, Open, Save, Print, etc., followed by buttons for Capacity Variants, Capacity Profile, and Definitions.

Below the toolbar, a status bar displays: 0 Sin..., 1 Multi, 0 Production Lin, 0 Calendar.

The main area shows a table with one row of data:

| Resource | Cat | Location | Time Z... | Factory Calendar | Planner Gr... | External Cap... | Start | End |
|-------------------|-----|----------|-----------|------------------|---------------|--------------------------|----------|----------|
| W1710_FA_1710_001 | P | 1710 | PST | W8 | A | <input type="checkbox"/> | 00:00:01 | 23:59:59 |

Below the table, the resource name is displayed as W1710_FA_1710_001, labeled as a Packaging machine.

The interface includes several tabs for resource configuration:

- General D...
- Time-Cont. Capacity
- PP/DS Bucket Cap.
- ExternalCap.
- Downtimes
- Block Plng
- PPO Parameters
- Short

The "Time-Cont. Capacity" tab is currently selected. It contains two sections:

Basic Data

| | | |
|------------|------|----------------------------|
| Res.Categ. | P | Production |
| Location | 1710 | Plant 1 US |
| Time Zone | PST | Pacific Time (Los Angeles) |
| Planner | A | 计划员组 A |
| Res. Group | | |

Available Capacity

| | | |
|------------|----|---------------------------------|
| Fact. Cal. | W8 | Germany - All days are workdays |
| Act. Var. | 1 | Normal Capacity |
| Ref.Resrce | | |

Figure 9.12 Resource Master View in Embedded PP-DS

Transfer of Production Data Structures : PPDS on ERP



Planning Version

Pl. Version in APO

000

Selection Criteria

Material



TS422*

to



Plant

1710

to



Production Version



to



Material Type



to



Plant-sp.mati status

03

to



MRP Controller



to



MRP Type

X0

to



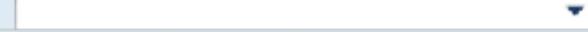
ABC Indicator



to



Version managed BOM & Routing



PDS Type

- Without Subcontracting
- Incl.Subco w/ Src Loc:Info Rec
- Subco with Source Loc:Info Rec
- Subco with Source Loc: Sch Agr
- Subco without Src Loc:Info Rec
- Subco without Src Loc:Sch Agr

Options

Processing

- Test Mode
- Extended Consistency Check
- Lock PDS in error case
- Transfer Deletion Flag
- Delete PDS Despite Usage

Transfer Mode

- Absolute Transfer
- Absolute Transfer (Delta Mode)
- Change Transfer
 - Only Change Pointers Older Than Date
 - Only Change Pointers Older Than

31.12.9999 23:59:59

0 Minutes

Figure 9.13 Transfer Production Version to Embedded PP-

DS

| Display Production Data Structure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------------------|-------------|-------------|---------------|--|------------|------------|--|-------------------------------------|-----------------|-----------------|----------------|------------|---------------|--------------------------|---------------------|----------|------------|----------|-------------------|------------|-----------------|-----------------|------|------|---------------|-----------------|--------|-------------|------------------|------|------------|--|--|------------|------------|---------------|-------------------------------------|------|------|--|--|--|--------------------------|------------------|-------|--------------|------|------------|--|--|------------|------------|-------|--------------------------|------|------|--|--|--|--------------------------|---------------------|--------------|------------------|------|------------|--|--|------------|------------|-------|--------------------------|------|------|--|--|--|--------------------------|---------------------|
| Details Product Number | | | | Description | Usage | Expllosion | Plan | Expllosion | Route | Type | Valid from | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TS422_FG100 | 1710 | TS422_FG100 | 17100001 | Finished good | PP/DS (Production and Detailed Scheduling) | | | Production Data Structure Generated from R/3 Routing | 23.06.2021 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Component View Operations Activities Activity Relationships | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Product Number</th> <th>Prod.Desc.</th> <th>Location</th> <th>Loc.Descri.</th> <th>Phantom</th> <th>Assembly</th> <th>Valid From</th> <th>Valid To</th> <th>Activity I/O Type</th> <th>PrimaryPrd</th> <th>MatCons(V) Unit</th> <th>MatCons(F) Unit</th> <th>Obj.</th> <th>Dep.</th> <th>Valuation SL:</th> <th>Prod. IO Sched.</th> <th>Offset</th> </tr> </thead> <tbody> <tr> <td>TS422_FG100</td> <td>Finished Product</td> <td>1710</td> <td>Plant 1 US</td> <td></td> <td></td> <td>23.06.2021</td> <td>31.12.9999</td> <td>Master Output</td> <td><input checked="" type="checkbox"/></td> <td>1 EA</td> <td>0 EA</td> <td></td> <td></td> <td></td> <td><input type="checkbox"/></td> <td>Integral End-End</td> </tr> <tr> <td>R-301</td> <td>Raw Material</td> <td>1710</td> <td>Plant 1 US</td> <td></td> <td></td> <td>23.06.2021</td> <td>31.12.9999</td> <td>Input</td> <td><input type="checkbox"/></td> <td>1 EA</td> <td>0 EA</td> <td></td> <td></td> <td></td> <td><input type="checkbox"/></td> <td>Integral Start-Stop</td> </tr> <tr> <td>TS422_SFG100</td> <td>Finished Product</td> <td>1710</td> <td>Plant 1 US</td> <td></td> <td></td> <td>23.06.2021</td> <td>31.12.9999</td> <td>Input</td> <td><input type="checkbox"/></td> <td>1 EA</td> <td>0 EA</td> <td></td> <td></td> <td></td> <td><input type="checkbox"/></td> <td>Integral Start-Stop</td> </tr> </tbody> </table> | | | | | | | | | | | | Product Number | Prod.Desc. | Location | Loc.Descri. | Phantom | Assembly | Valid From | Valid To | Activity I/O Type | PrimaryPrd | MatCons(V) Unit | MatCons(F) Unit | Obj. | Dep. | Valuation SL: | Prod. IO Sched. | Offset | TS422_FG100 | Finished Product | 1710 | Plant 1 US | | | 23.06.2021 | 31.12.9999 | Master Output | <input checked="" type="checkbox"/> | 1 EA | 0 EA | | | | <input type="checkbox"/> | Integral End-End | R-301 | Raw Material | 1710 | Plant 1 US | | | 23.06.2021 | 31.12.9999 | Input | <input type="checkbox"/> | 1 EA | 0 EA | | | | <input type="checkbox"/> | Integral Start-Stop | TS422_SFG100 | Finished Product | 1710 | Plant 1 US | | | 23.06.2021 | 31.12.9999 | Input | <input type="checkbox"/> | 1 EA | 0 EA | | | | <input type="checkbox"/> | Integral Start-Stop |
| Product Number | Prod.Desc. | Location | Loc.Descri. | Phantom | Assembly | Valid From | Valid To | Activity I/O Type | PrimaryPrd | MatCons(V) Unit | MatCons(F) Unit | Obj. | Dep. | Valuation SL: | Prod. IO Sched. | Offset | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TS422_FG100 | Finished Product | 1710 | Plant 1 US | | | 23.06.2021 | 31.12.9999 | Master Output | <input checked="" type="checkbox"/> | 1 EA | 0 EA | | | | <input type="checkbox"/> | Integral End-End | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-301 | Raw Material | 1710 | Plant 1 US | | | 23.06.2021 | 31.12.9999 | Input | <input type="checkbox"/> | 1 EA | 0 EA | | | | <input type="checkbox"/> | Integral Start-Stop | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TS422_SFG100 | Finished Product | 1710 | Plant 1 US | | | 23.06.2021 | 31.12.9999 | Input | <input type="checkbox"/> | 1 EA | 0 EA | | | | <input type="checkbox"/> | Integral Start-Stop | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 9.14 Component View to Display BOMs

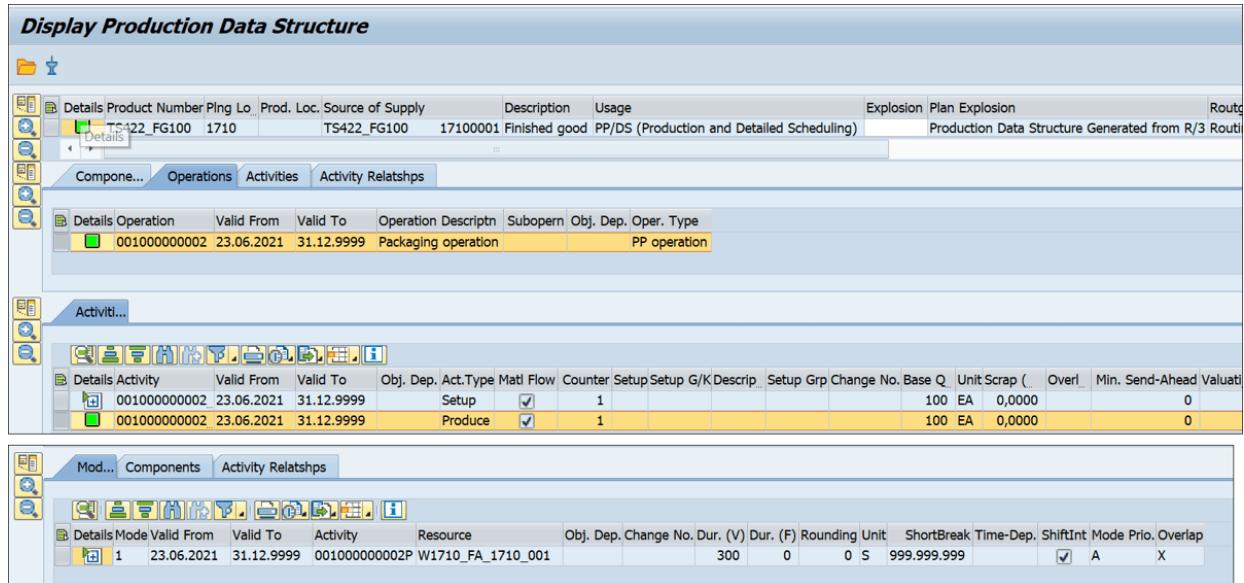


Figure 9.15 Operation View Displays Routing Information

| Display Production Data Structure | | | | | | | | | | |
|-----------------------------------|----------------|-----------------|------------|------------------|--|-------------------------------------|-----------|--|-------------------------------------|--|
| Details | | Product Number | Prod. Loc. | Source of Supply | Description | Usage | Explosion | Plan Explosion | Routing | Type Valid |
| TS422_FG100 | 1710 | TS422_FG100 | 17100001 | Finished good | PP/DS (Production and Detailed Scheduling) | | | Production Data Structure Generated from R/3 Routing | | 23.0 |
| Activity Relationships | | | | | | | | | | |
| Details | Preceding Act. | Succeeding Act. | Valid From | Valid To | Relationship | Min. Time Max. Ti | Av. Ti | Mode Linkage | Matl Flow C | Constraint Tp. for liveCache |
| 001000000002 | 001000000002 | 23.06.2021 | 30.12.9999 | | End-Start Relationship | | | Identical Resource | <input checked="" type="checkbox"/> | X Minimum Interval (Minimum Constraint) Buffer Tim |
| Activities | | | | | | | | | | |
| Details | Activity | Valid From | Valid To | Obj. Dep. | Act. Type | Matl Flow Counter | Setup | Setup G/K Descriptn | Setup Grp Change No. | Base Qty Unit Scrap (%) Overlap Min. Send-Ahead Valuation BP Class |
| | 001000000002S | 23.06.2021 | 31.12.9999 | | Setup | <input checked="" type="checkbox"/> | 1 | | | 100 EA 0,0000 0 |
| | 001000000002P | 23.06.2021 | 31.12.9999 | | Produce | <input checked="" type="checkbox"/> | 1 | | | 100 EA 0,0000 0 |

Figure 9.16 Activity Relationships View Displays Details of Each Operation and Their Relation in Routing

Display External Procurement Relationships

| General Data | | Procurement Form | |
|------------------|------------------------|------------------|--------------|
| Supply Srce Cat. | Info Rec | Document Item | Stand. |
| Doc. Number | 5300000481 | Product Descr. | Raw Material |
| Product | R-301 | Purchasing Org. | 1710 |
| Logical System | 400 | Valid to | 31.12.9999 |
| Valid frm | 01.01.1990 | Dest. Loc. | 1710 |
| Source Loc. | 0017300001 | DestLoc. Dscr. | Plant 1 US |
| SrceLoc. Dscr. | Domestic US Supplier 1 | | |

| Settings | | Pind Del. Time | |
|-------------------------------------|--------------------------------|----------------|---|
| <input checked="" type="checkbox"/> | Ext. proc. relationship active | 5,00 | Days <input checked="" type="checkbox"/> Take into Acc. |

| Assigned Transportation La... | | | | | | | |
|-------------------------------------|------------|------------|------------------|---------------|---------------|---------------------|--------------------------|
| Lock Indicator | Valid From | Valid To | Procmnt Priority | Min. Lot Size | Max. Lot Size | Form of Procurement | Target Location |
| <input checked="" type="checkbox"/> | 01.01.1990 | 31.12.9999 | 0,00 | 0,000 | 0,000 | Stand. | 1710 |
| | | | | | | | <input type="checkbox"/> |

Figure 9.17 External Procurement Relationships in PP-DS

Display 1710 -> 1010

This screenshot shows the SAP Product-Specific Means of Transport (PP-DS) interface. The main title bar reads "Display 1710 -> 1010". Below it, there are tabs for "Header Data", "Product-Specific Means of Transport", "Trsp. Serv. Provider", and "Total Procurement / Transport".

The central area is divided into several sections:

- Product-Specific Transportation Lane:** Shows a table with columns: Product, Prod.Desc., Start date, End Date, Min. LS Max. LS, Proc.Prio., Dist.Prio., Proc.Costs, Cost Func., Subcontr., Consignment, Src Cat, Doc.
- Means of Transport:** Shows a table with columns: MTr, MTr Descr., Start date, End Date, All Prods Aggr., Ping Detid, Ping Trsp. Cal, Fix Duratn, Trsp. Dur, Stop Dur, Fix Dist., Trsp. Dist., Unit, Precision.
- Planning Parameters:** Includes fields for Planning Horizon (0 Days), Partner Horizon (0 Days), Production Time (Hours), Usage: Lead Time, Maintained Procurement Lea., Horizon for Exptd Receipts (0 Days), Horiz. Fut. Aval. Whse Stck (0 Days), ID Supplier Shutdown, Sync. Cal. for Goods Receipt, Dyn. freeze horizon, Order Type Inv.Bal.Unsr., Stock Transpo., Form of Procurement (Standard selected), Creation Indicator (Creation from Special Procur.), External Procurement Relationship, Source Category, and Purchasing Doc. No.

A black arrow points from the "Creation Indicator" field in the right-hand panel back towards the "Means of Transport" table.

Figure 9.18 Transportation Lane in Embedded PP-DS

Create Integration Model

The screenshot shows the SAP 'Create Integration Model' dialog. At the top, there are icons for saving, canceling, and exiting. Below that, the 'Model Name' is set to '1710_PIR', 'Logical System' is '400', and 'APO Application' is 'PIRS'. On the left, under 'Material Dependent Objects', several checkboxes are available: 'Materials', 'MRP Area Matl', 'AMPL', 'Planning Matl', 'Contracts', and 'Pur.Info Record'. The 'Pur.Info Record' checkbox is checked and highlighted with a black border. To the right of these checkboxes are three small yellow icons. On the right side of the dialog, there are two sections: 'General Selection Options for Materials' and 'Selection of Source of Supply'. In the 'General Selection Options for Materials' section, fields include 'Material' (R-301), 'Plnt' (1710), 'Matl Type', 'PlantSpec. Mtl Stat', 'MRP Ctrlr', 'MRP Type', 'ABC Indicator', and 'Warehouse Number'. In the 'Selection of Source of Supply' section, there are two checkboxes: 'Material-Dependent Source of Supply Selection' (checked) and 'Include Dependent Vendors and Issuing Plants'. Below these are fields for 'Vendor', 'Create Loc./BP', 'Material' (R-301), and 'Supplying Plant'.

| | |
|-----------------|----------|
| Model Name | 1710_PIR |
| Logical System | 400 |
| APO Application | PIRS |

| Material Dependent Objects | | General Selection Options for Materials | |
|---|--|--|-------|
| <input type="checkbox"/> Materials | <input type="checkbox"/> MRP Area Matl | <input type="checkbox"/> Material | R-301 |
| <input type="checkbox"/> AMPL | <input type="checkbox"/> Planning Matl | <input type="checkbox"/> Plnt | 1710 |
| <input type="checkbox"/> Contracts | <input type="checkbox"/> Pur.Info Record | <input type="checkbox"/> Matl Type | |
| <input type="checkbox"/> Supply Area | | <input type="checkbox"/> PlantSpec. Mtl Stat | |
| <input type="checkbox"/> SchedAgreements | | <input type="checkbox"/> MRP Ctrlr | |
| <input type="checkbox"/> Contracts | | <input type="checkbox"/> MRP Type | |
| <input checked="" type="checkbox"/> Pur.Info Record | | <input type="checkbox"/> ABC Indicator | |
| | | <input type="checkbox"/> Warehouse Number | |

| Selection of Source of Supply | |
|---|-------|
| <input checked="" type="checkbox"/> Material-Dependent Source of Supply Selection | |
| <input type="checkbox"/> Include Dependent Vendors and Issuing Plants | |
| Vendor | |
| Create Loc./BP | |
| Material | R-301 |
| Supplying Plant | |

Figure 9.19 Transferring Purchase Info Records, Scheduling Agreements, Contracts to PP-DS via CIF

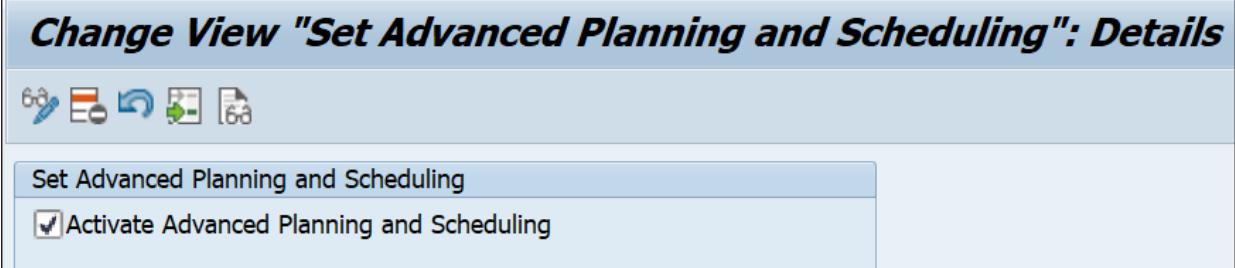


Figure 9.20 Configuration Node: Activate Advanced Planning and Scheduling

| Change View "Logical Systems": Overview | |
|---|---|
|  New Entries |       |
| Logical Systems | |
| | Log.System |
| | 400 |
| | Name |
| | 400 |

Figure 9.21 Name for the Logical System

Display View "Clients": Details

Client

City

Logical system Last Changed By

Currency Date

Client Role

Changes and Transports for Client-Specific Objects

Changes without automatic recording
 Automatic recording of changes
 No changes allowed
 Changes w/o automatic recording, no transports allowed

Cross-Client Object Changes

Changes to repository and cross-client customizing allowed

Client Copy and Comparison Tool Protection

Protection level 0: No restriction

CATT and eCATT Restrictions

eCATT and CATT Allowed

Figure 9.22 Assign the Logical System to a Client

RFC Destination [400]

Remote Logon Connection Test Unicode Test Fast Serialization Test

| | | |
|-----------------|---|--|
| RFC Destination | [400] | |
| Connection Type | 3 ABAP Connection | |
| Description | Description 1 Description 2 Description 3 | |

Administrati... Technical Settings Logon & Security Unicode Special Options

Target System Settings

Load Balancing Status
Load Balancing Yes No

Target Host Instance No.

Save to Database as
Save as Host IP Address

This screenshot shows the SAP RFC Destination configuration interface. At the top, it displays the destination number '400'. Below this are tabs for 'Remote Logon', 'Connection Test', 'Unicode Test', and 'Fast Serialization Test'. The main configuration area starts with 'RFC Destination' set to '400' and 'Connection Type' set to '3 ABAP Connection'. A 'Description' section follows, containing three fields: 'Description 1' (containing '400'), 'Description 2', and 'Description 3'. Below these are several tabs: 'Administrati...', 'Technical Settings' (which is selected), 'Logon & Security', 'Unicode', and 'Special Options'. Under 'Technical Settings', there is a 'Target System Settings' group. It includes a 'Load Balancing Status' section with radio buttons for 'Yes' and 'No' (the latter is selected). There are also fields for 'Target Host' and 'Instance No.' (set to 00). At the bottom, there's a 'Save to Database as' section with radio buttons for 'Host' (selected) and 'IP Address', followed by a text input field.

Figure 9.23 Set Up the RFC Destination

| Change View "Business System Group": Overview | |
|---|---|
|  New Entries |       |
| Business System Group | |
| BusSystGrp | Description |
| BSG | Business System Group |

Figure 9.24 Maintain Business System Group

| Change View "Assignment of Logical System to Business System Group": O | | | | | |
|---|----------------|----------|---------------|------------------------------|------------|
|  New Entries       | | | | | |
| Assignment of Logical System to Business System Group | | | | | |
| BusSystGrp | Logical system | SAP Ind. | Rele... | Queue Type | Err. Hndlg |
| BSG | 400 X | 700 | Inbound Queue | Strict (Terminate at Errors) | |

Figure 9.25 Assign the Logical System and Queue Type

| Change View "Systems and Their Types and Releases": Overview | | | |
|--|-------------|---------|--|
| | New Entries | | |
| Log.System | Syst.Type | Release | |
| 400 | SAP_APO | 713 | |

Figure 9.26 Specify SAP Advanced Planning and Optimization Release

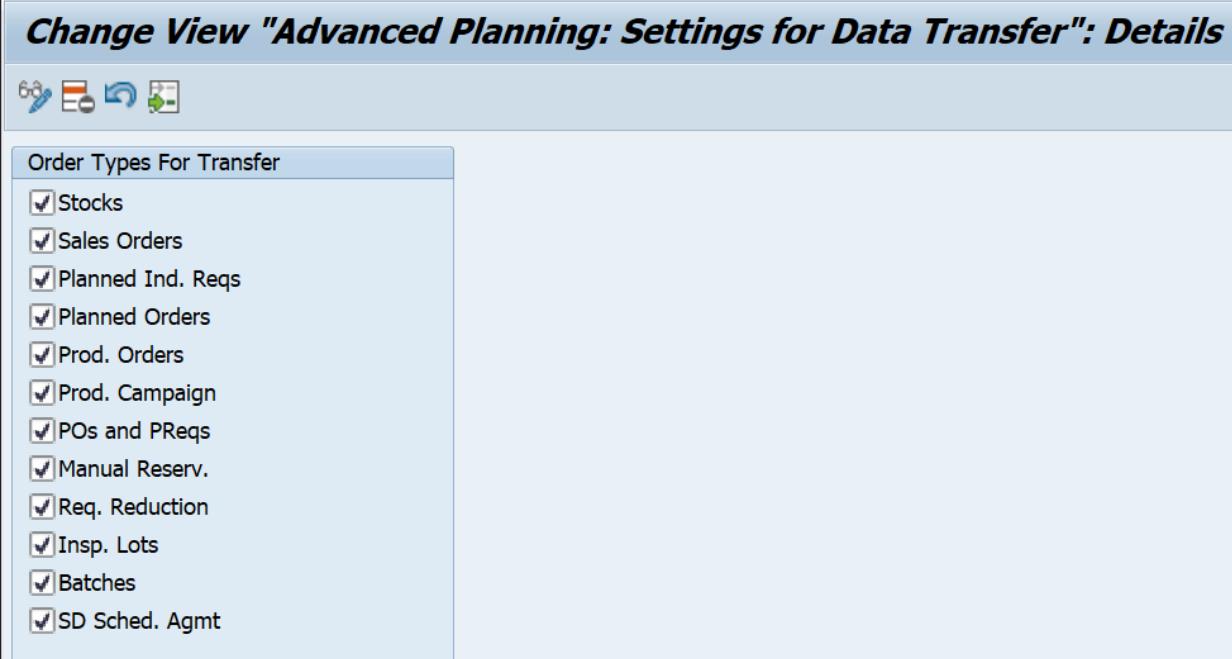


Figure 9.27 Settings for Transactional Data Transfer

Change View "MRP areas - Subcontracting": Details

New Entries

Dialog Structure

- MRP areas - Subcontracting
 - Subcontractor (one entry per MR)

| | | |
|---------------|------------|---------------|
| MRP Area | SUBCON1710 | Subcontractor |
| MRP Area Type | 3 | |
| Plant | 1710 | Plant 1 US |

Material Overview for MRP Area

Generate MRP Records for MRP Area

Gen. sim. MRP Records for MRP Area

Figure 9.28 .28 Define the MRP Area for Subcontractors

Display Global Parameters and Default Values

69

Plann... ATP Categories

| | |
|---|--|
| Logging | No Logging |
| Create/Change Orders | |
| <input type="checkbox"/> Use Number Range | Number Range Number SAP_PP_001 |
| Heuristic for Change Quantity | Production Data Structure Generated from R/3 |
| Plan Explosion | No Restrictions |
| Remove Orders from ProdCampaign | Always Create Transfer Events (Default) |
| Transfer to R/3 In-House Production | Always Create Transfer Events (Default) |
| Transfer to R/3 Ext. Procurement | Fixed Pegging is Inactive |
| Activate Fixed Pegging | |
| Time Interval for Concurrent Pegging | 1:00 |
| Schedule Orders: Strategy Profiles | |
| Interactive Planning | SAP002 |
| Integrated DS Plng Board | SAP001 |
| Planning Run | SAP002 |
| R/3 Integration | SAP002 |
| BAPI | SAP002 |
| Schedule Orders | |
| Propagation Range | SAPALL |
| Display Orders | |
| <input checked="" type="checkbox"/> Display Earliest/Latest Operation Dates | |
| Conversion | |
| Conversion Rule | SAP001 Standard (ATP+BAdI) |

Figure 9.29 Maintain Global Parameters and Defaults

| Display Global Parameters and Default Values | | |
|---|--|---|
| ATP Categories | | |
| Categories for PP/DS | | |
| | | |
| Receipt Elements | | Requirement Elements |
| Ext. Procurement | AG Purchase Requisition | In-House Productn AY Dependent demand |
| In-House Productn | AI Planned order (not firmed, unconfirmed) | Sub.Con. Purc Req. AG Purchase Requisition |
| In-house, w/o BOM | AI Planned order (not firmed, unconfirmed) | Sub.Con. Purc Ord. SO |
| In-house, Firmed | AJ Planned order (firmed, unconfirmed) | Sub.Con. Sch. Line SS Subco Scheduling Agreement Schedule |
| In-HseProd.Confrm | AK Planned order (not firmed, confirmed) | Stock Transfer BH Stock transport requisition |
| InHsePrdCnfmd,Frmd | AL Planned order (confirmed, firmed) | Stock Transfer Cnfg BI Stock transport order |
| Stock Transfer | AG Purchase Requisition | Product Substitute AY Dependent demand |
| Stock Transfer Cnfg | BI Stock transport order | Stock Trans. Res. BC Stock transfer reservation |
| Product Substitute | AI Planned order (not firmed, unconfirmed) | Sch.Agr.: Ext.Proc BJ Suppliers' SchdngAgrmtRqmt |
| Stock Trans. Res. | BD Stock transfer reservation | Sch.Agr. at Vendor BW Suppliers' Release Order Reqmt |
| Sch.Agr.: Ext.Proc | BE Scheduling Agreement Schedule Line | Sch.Agr.:Sup.Plant BJ Suppliers' SchdngAgrmtRqmt |
| Sch.Agr. Release | BV Scheduling Agreement Release | SA Rel. at Vendor HC Confirmation at Vendor - SA |
| Sch.Agr.: Stk Tran | BE Scheduling Agreement Schedule Line | SA Rel. in SupPlnt HC Release from Customer in Plant - SD |
| Sch.Agr. Rel St Tr | BV Scheduling Agreement Release | SA Conf. at Vendor HC Confirmation at Vendor - SD |
| SA Conf. in Plant | HA Confirmation in Plant - SA | SSA Rel. in Plant HC Release from Customer in Plant - SD |
| SSA Rel. at Cust. | HD Release at Customer - SD Sched. Agrmt | SSA Conf. at Plant HC Release from Customer in Plant - SD |
| SSA Conf. at Cust. | HF Confirmation at Customer - SD SA | |

Figure 9.30 Specify ATP Categories in Global Parameters for Embedded PP-DS

Change View "Person Responsible for a Product": Details

| | |
|---|--------------|
| Planner | A01 |
| Person Responsible for a Product | |
| <input checked="" type="checkbox"/> Prod. Planner | |
| <input type="checkbox"/> Purch. Planner | |
| <input type="checkbox"/> DRP Plnr | |
| <input type="checkbox"/> SC Analyst | |
| <input type="checkbox"/> Inventory Plnr | |
| <input type="checkbox"/> Forecast Planner | |
| <input type="checkbox"/> Buyer | |
| Planner Name | Test planner |
| Full name | Plannner 1 |
| DL name | |

Figure 9.31 Specify Planner for Embedded PP-DS

Model/Planning Version Mgmt: Display Planning Version Data

| Model/Planning version | | Description |
|------------------------|------|----------------|
| - 000 | 000 | Active Version |
| | TEST | Test Version |

Additional Functions

Created By [] On [] 02.03.201
 Last Change By [] On [] 24.06.202
 Scheduled for Deletion By []
 Del. Date [] On [] At [] 00:00:00

Planning Version
 Name 000 Active Version

Administration Information
 Created By [] On [] 02.03.201
 Scheduled for Deletion By []
 Del. Date [] On [] At [] 00:00:00
 Both Transaction Data and Master Data Will Be Deleted

PP/DS

Change Planning Active
 PP/DS Horizon in Days [] 999
 Determine Priority
 Take Safety Stock into Account
 No Order Without Source of Supply

Figure 9.32 Create and Maintain Model Version Management in Embedded PP-DS

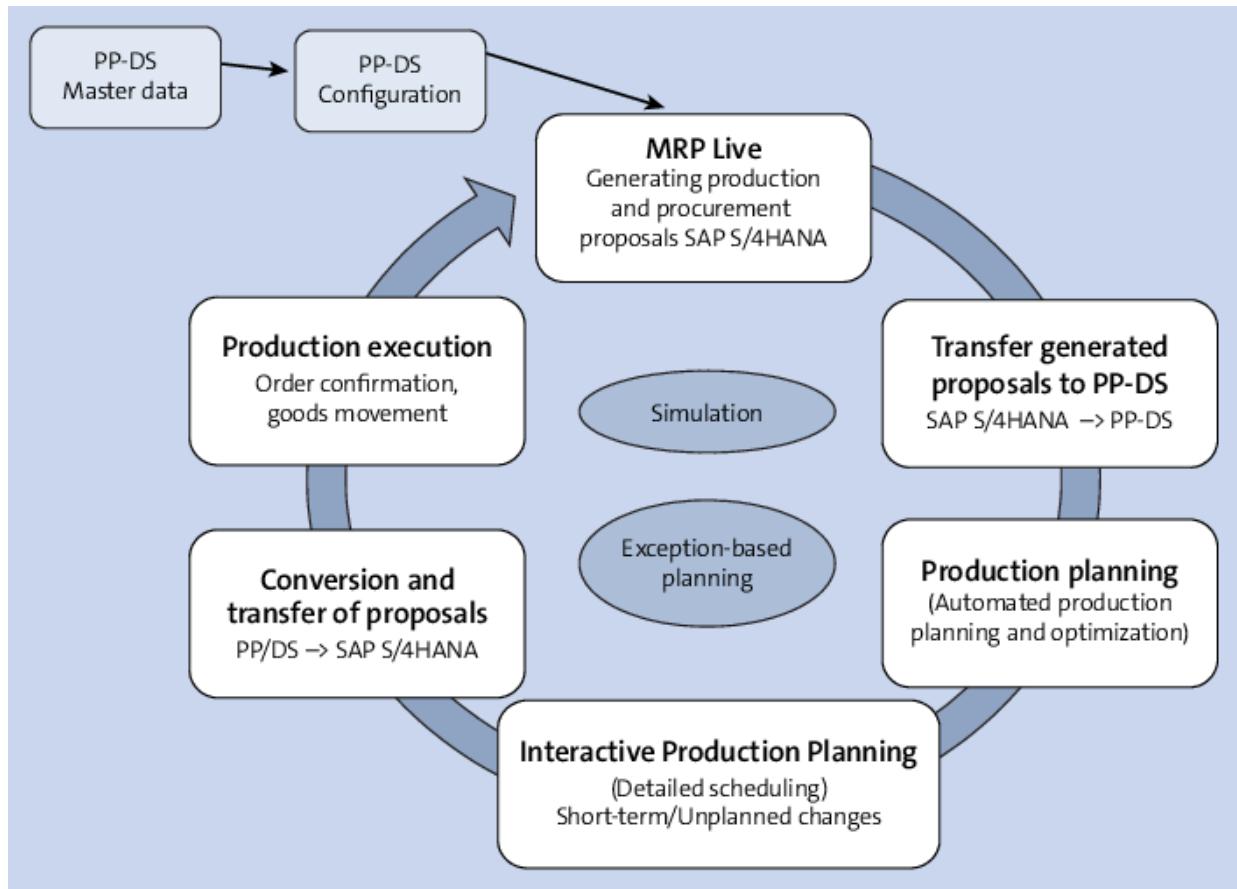


Figure 9.33 Planning Process with PP-DS

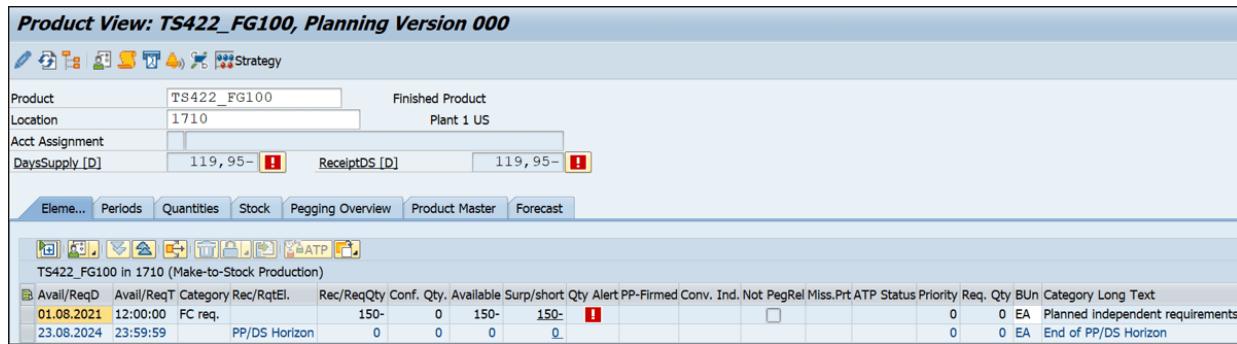


Figure 9.34 Product View in PP-DS

MRP Live

The screenshot shows the MRP Live software interface. In the top left, there are icons for saving and exiting. Below that is a toolbar with a magnifying glass and other icons.

Planning Scope

| | | | |
|----------------|-------------|----|--|
| Plant | 1710 | to | |
| Material | TS422_FG100 | to | |
| Product group | | to | |
| MRP Controller | | to | |
| Material Scope | A | | |

Also to be Included in Planning

- Changed BOM Components
- All Order BOM Components
- Stock Transfer Materials

Control Parameters

- Regenerative Planning
- Scheduling: 1
- Planning Mode: 3
- Name for Performance Log: (empty)
- Output Material List (Job Log): (empty)

An arrow points from the 'A' selection in the Material Scope row of the Planning Scope table to the 'Matl Scope' column of a separate dialog box titled 'Material Scope for MRP 3 Entries'.

Material Scope for MRP 3 Entries

| Matl Scope | Short Descript. |
|------------|--------------------|
| A | All Materials |
| M | MRP Materials Only |
| S | MPS Materials Only |

Figure 9.35 MRP Live Run

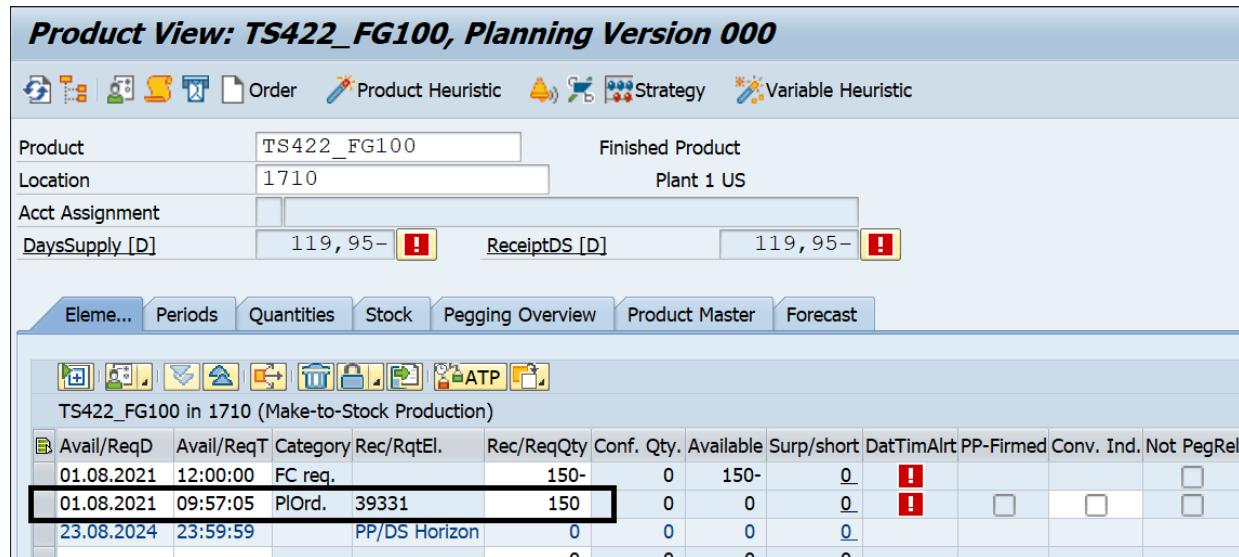


Figure 9.36 Product View with Finished Material Proposal in Embedded PP-DS

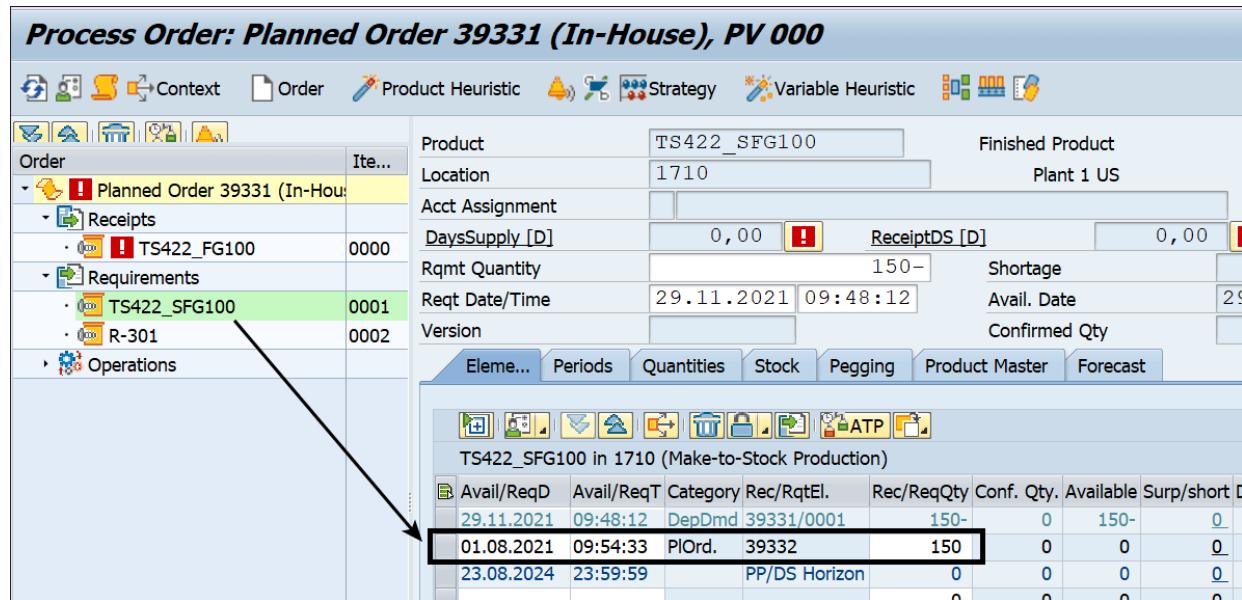


Figure 9.37 Product View with Subassembly Material Proposal

Production Planning Run

Settings for Heuristic Strategy

Global Settings

| | |
|--------------------|--------|
| Planning Version | 000 |
| Time Profile | SAP001 |
| Propagation Range | SAPALL |
| Simulation Version | |

Control Parameters

Display Logs

Step 01: Product Planning (Comp. acc. LLevl Co... Step 02: Schedule Sequence Step 03: Step 04: Step 05: Step 06:

Function/Heuristic Product Planning (Comp. acc. LLevl Code)

Heuristic SAP_MRP_001

Time Profile Step 01 SAP001

Strategy Profile

Optimization Profile

Planning Object Products

Saving Data by Using the Heuristic

Selection of Products for the Processing Step 01

| | | | | |
|--------------------|-------|----|--|--|
| Product Number | [x] * | to | | |
| Location | 1710 | to | | |
| Production Planner | | to | | |
| Planning Group | | to | | |

Figure 9.38 Step 01: Product Planning While Considering Low-Level Code

Production Planning Run

Settings for Heuristic Strategy

Global Settings

| | |
|--------------------|--------|
| Planning Version | 000 |
| Time Profile | SAP001 |
| Propagation Range | SAPALL |
| Simulation Version | |

Control Parameters

Display Logs

Step 01: Product Planning (Comp. acc. LLevl Co... Step 02: Schedule Sequence Step 03: Step 04: Step 05:

Function/Heuristic Schedule Sequence

| | |
|----------------------|-----------|
| Heuristic | SAP001 |
| Time Profile Step 02 | SAP001 |
| Strategy Profile | |
| Optimization Profile | |
| Planning Object | Resources |

Saving Data by Using the Heuristic

Selection of Resources for the Processing Step 02

| | | | |
|---|--------------------|----|--|
| Resource | W1710_FA_1710_0... | to | |
| Location | 1710 | to | |
| Resource Category | | to | |
| Planner | | to | |
| <input checked="" type="checkbox"/> Finite Scheduling | | | |

Figure 9.39 Step 02: Schedule Orders Generated Based on the Defined Scheduling Sequence

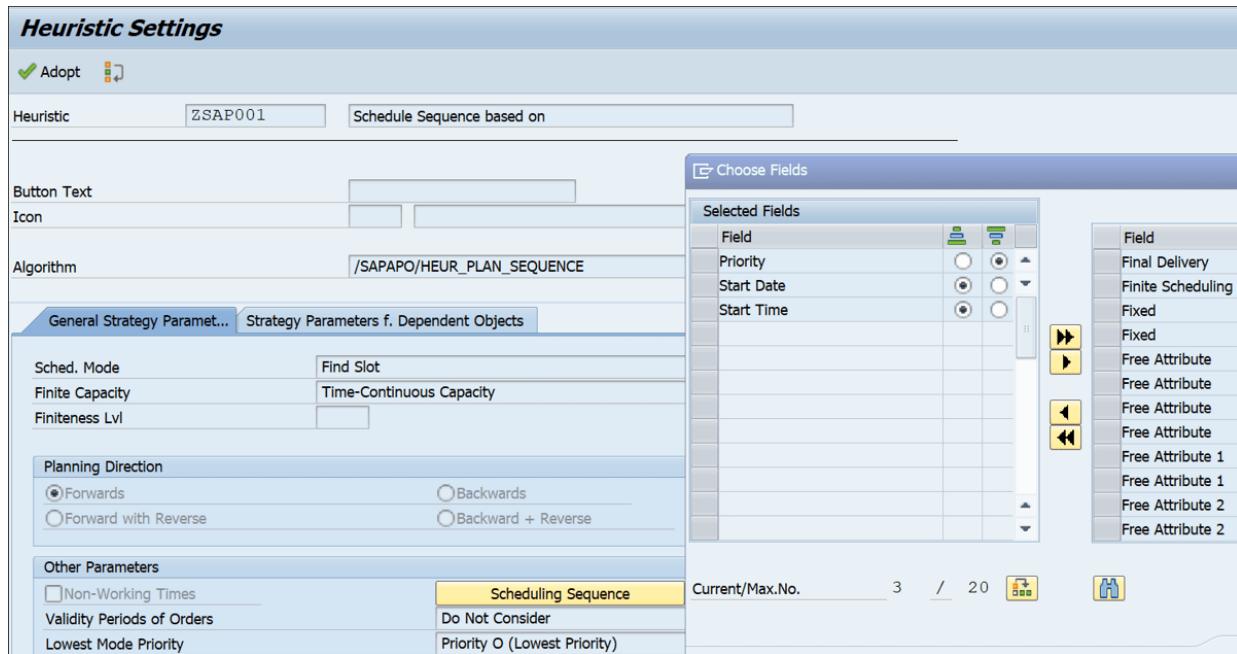


Figure 9.40 Custom Heuristic Creation with Sequence Fields Update

| Display Heuristics | | | |
|--------------------|--------------|--|--------------------------------|
| | Heuristic | Short Description | Algorithm |
| | SAP001 | Schedule Sequence | /SAPAPO/HEUR_PLAN_SEQUENCE |
| | SAP002 | Remove Backlog | /SAPAPO/HEUR_RESOLVE_BACKLOG |
| | SAP003 | Schedule Sequence Manually | /SAPAPO/HEUR_PLAN_SEQUENCE_MAN |
| | SAP004 | Minimize Runtime | /SAPAPO/HEUR_REDUCE_LEADTIME |
| | SAP005 | Schedule Operations | /SAPAPO/HEUR_DISPATCH |
| | SAP_CDPBP_01 | Reschedule Blocks | /SAPAPO/MC01_HEU_BLOCKS_SCHED |
| | SAP_CDPBP_02 | Adjust and Reschedule Block Limits | /SAPAPO/MC01_HEU_BLOCK_ADJUST |
| | SAP_CDPBP_03 | Enhanced Block Maintenance | /SAPAPO/BLRG_HEUR_BLK_MAINT |
| | SAP_CDPBP_04 | Block Maintenance, Called Interactively | /SAPAPO/MC01_R05_RES_EDIT_HEUR |
| | SAP_CDS_A01 | Admissibility OK Without Check | /SAPAPO/HEU_CDS_ADMI_OK_WO_CHK |
| | SAP_CDS_A02 | Tolerance Check | /SAPAPO/HEU_CDS_TOLCHK_LCDDS |
| | SAP_CDS_F01 | Confirm Compliance Without Check | /SAPAPO/HEU_CDS_MATCHING_CONF |
| | SAP_CDS_F02 | Days' Supply Check | /SAPAPO/HEU_CDS_DSUP_CHK |
| | SAP_CDS_F03 | Product Heuristic w. Days' Supply Check | /SAPAPO/HEU_CDS_PHEU_DSUP_CHK |
| | SAP_CHECK_01 | Check PDS | /SAPAPO/CULL_PDS_CHECK_HEUR |
| | SAP_DS_01 | Stable Forward Scheduling | /SAPAPO/SFW_HEUR_FW_STABLE |
| | SAP_DS_02 | Enhanced Backward Scheduling | /SAPAPO/SFW_HEUR_BW_EXT |
| | SAP_DS_03 | Change Fixing/Planning Intervals | /SAPAPO/HEUR_REL_FIXINT_MAINT |
| | SAP_DS_04 | Activate Seq.-Dependent Setup Activities | /SAPAPO/HEUR_ACTIVATE_SETUPACT |
| | SAP_INAC_01 | Firm inactive Planned Orders | /SAPAPO/HEU_INAC_ORD_FIRM |
| | SAP_INAC_02 | Unfirm inactive Planned Orders | /SAPAPO/HEU_INAC_ORD_UNFIRM |

Figure 9.41 Maintain Heuristics Customizing

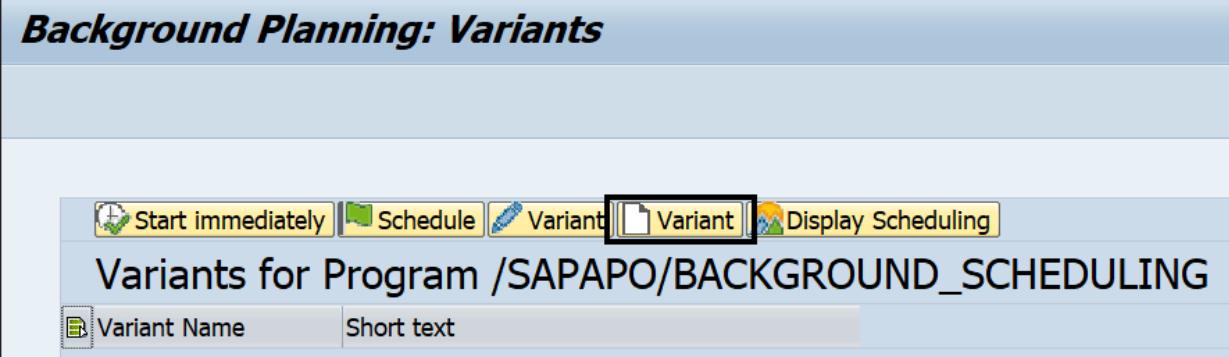


Figure 9.42 Background Job: Variant Creation and Job Scheduling

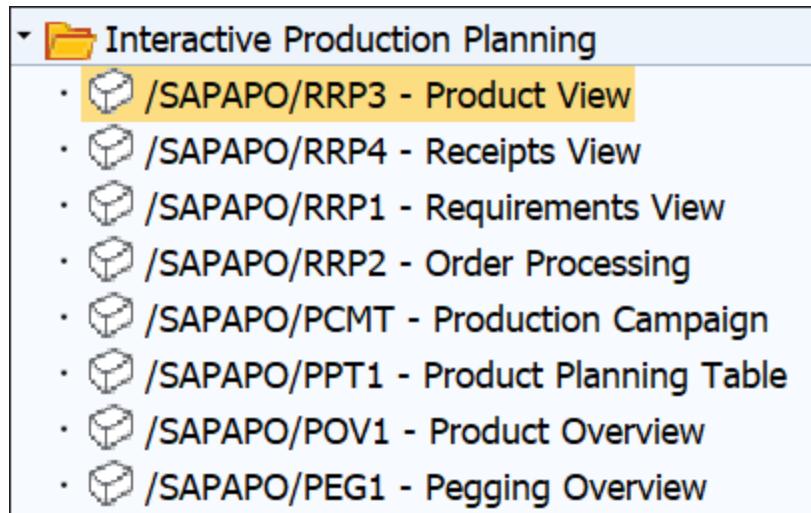


Figure 9.43 Interactive Production Planning

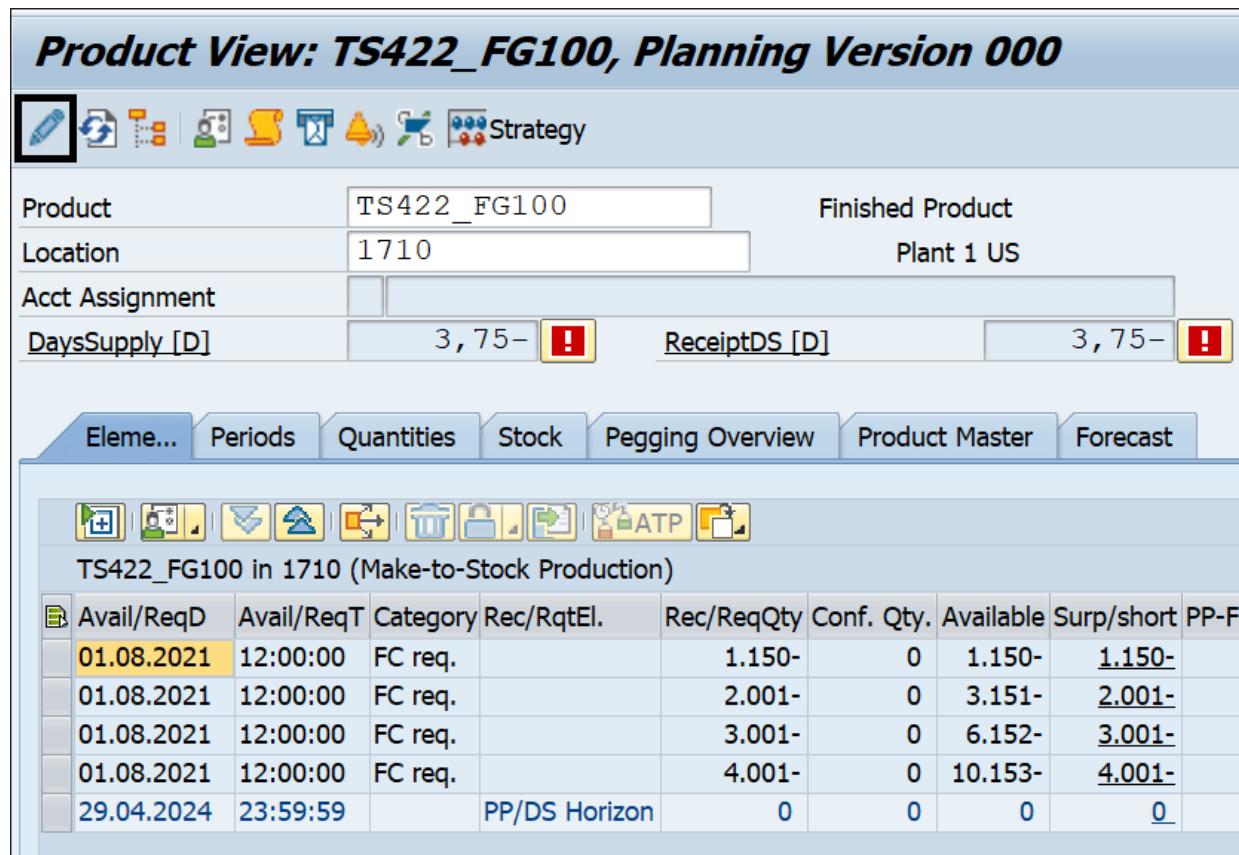


Figure 9.44 Product View: Change Icon

Product View: TS422_FG100, Planning Version 000

| Avail/ReqD | Avail/ReqT | Category | Rec/RqtEl. | Rec/ReqQty | Conf. Qty. | Available | Surp/short | PP-Firmed | Co. |
|------------|------------|----------|---------------|------------|------------|-----------|------------|-----------|-----|
| 01.08.2021 | 12:00:00 | FC req. | | 1.150- | 0 | 1.150- | 1.150- | | |
| 01.08.2021 | 12:00:00 | FC req. | | 2.001- | 0 | 3.151- | 2.001- | | |
| 01.08.2021 | 12:00:00 | FC req. | | 3.001- | 0 | 6.152- | 3.001- | | |
| 01.08.2021 | 12:00:00 | FC req. | | 4.001- | 0 | 10.153- | 4.001- | | |
| 29.04.2024 | 23:59:59 | | PP/DS Horizon | 0 | 0 | 0 | 0 | | |
| | | | | 0 | 0 | 0 | 0 | | |

Figure 9.45 Change View: Heuristic Options

Plan Product

| | | | | | | | |
|---|--------------------------|----------|------|---|-----|------|----|
| Product | TS422_FG100 | Location | 1710 | Plng Version | 000 | Unit | EA |
| Acct Assignment | Make-to-Stock Production | | | | | | |
| <input type="checkbox"/> Use Lot Size Settings from Heuristic | | | | | | | |
| Lot Size/Days' Supply | | | | | | | |
| Procedures <input checked="" type="radio"/> Lot-for-Lot <input type="radio"/> Fixed Lot Size <input type="radio"/> By Period <input type="radio"/> Reorder Point | | | | Lot Size Unit: EA Planning Calendar: <input type="text"/> Number of Periods: 1 Reorder Days' Supply: <input type="text"/> | | | |
| Quantity Determination Minimum Lot Size: <input type="text"/> Maximum Lot Size: <input type="text"/> Targ.Stk Lvl Method: <input type="checkbox"/> | | | | Assembly Scrap (%): <input type="text"/> Rounding Value: <input type="text"/> Rounding Profile: <input type="text"/> Target Days' Supply: <input type="text"/> | | | |
| Scheduling Safety Days'S.: <input type="text"/> Use Period Factor: <input type="checkbox"/> | | | | Period Factor: <input type="text"/> | | | |
| Stock Data Safety Stock: 0 Reorder Point: <input type="text"/> | | | | | | | |
| <input type="button" value="Adopt"/> <input type="button" value="X"/> | | | | | | | |

Figure 9.46 Plan Product: Change Lot Size

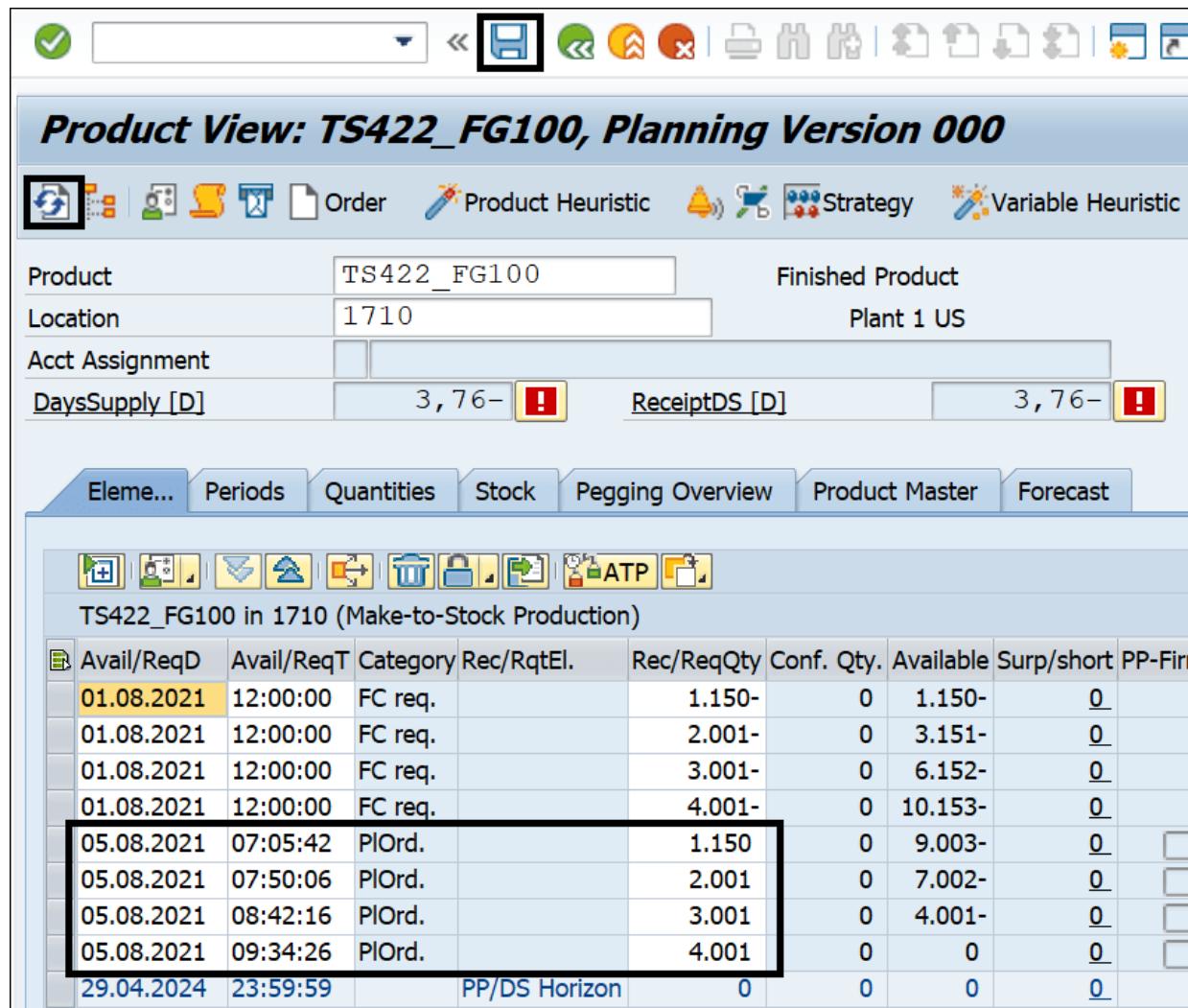


Figure 9.47 Planning (Simulated) Situation

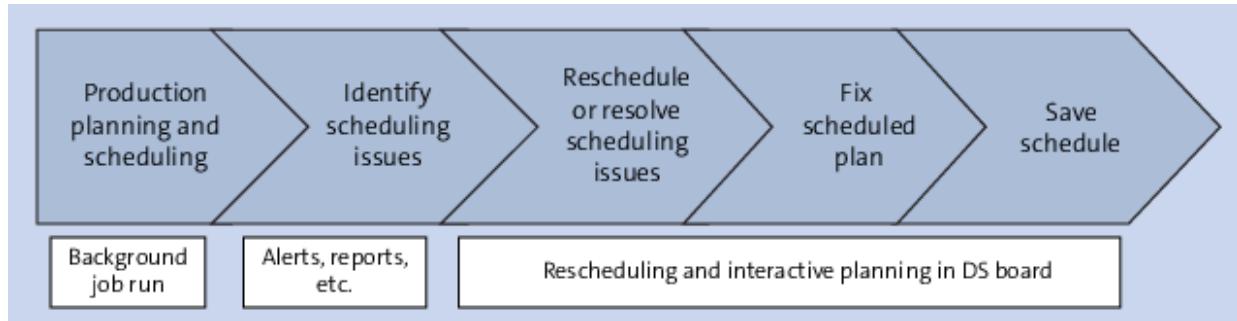


Figure 9.48 Production Planning in PP-DS

Change View "Strategies": Details

The screenshot shows the SAP interface for changing strategy profiles. The title bar says "Change View 'Strategies': Details". The left sidebar shows "Dialog Structure" with "Strategy Profile" expanded, and "Strategies" selected. The main area has tabs "General Strategy Paramet..." and "Strategy Parameters f. Dependent Objects".

| Cross-Strategy Parameters | | Desired Date |
|----------------------------|--------|---|
| Scheduling Offset | 0 | <input checked="" type="radio"/> Current Date |
| Current Modes | Retain | <input type="radio"/> Earliest Date |
| Scheduling Sequence | | <input type="radio"/> Specified Date |

| General Strategy Parameters | |
|-----------------------------|---------------------------------|
| Sched. Mode | Find Slot |
| Finite Capacity | Time-Continuous Capacity |
| Finiteness Lvl | 9999 Restricted Finite Resource |

| Planning Direction | |
|--|--|
| <input checked="" type="radio"/> Forwards | <input type="radio"/> Backwards |
| <input type="radio"/> Forward with Reverse | <input type="radio"/> Backward + Reverse |

| Other Parameters | |
|--|-------------------------------|
| <input type="checkbox"/> Non-Working Times | |
| <input type="checkbox"/> Consider Campaign Requirement | |
| Validity Periods of Orders | Consider |
| Lowest Mode Priority | Priority O (Lowest Priority) |
| Lowest ResNet Link Priority | Priority O |
| Block Planning | Take Into Account |
| Scheduling to Block Limits | As Specified in the Operation |

Figure 9.49 General Strategy Parameters in the Detailed Strategy Profile

General Strategy Paramet... Strategy Parameters f. Dependent Objects

| | |
|--|--|
| Sched. Submode | Schedule Dependent Operations Infinitely |
| Time Relationships | |
| Order-Int. Rel. | Always Consider |
| Cross-Order Rel | Do Not Consider |
| Compact Sched. | None |
| <input type="checkbox"/> Consider Maximum Intervals | |
| <input type="checkbox"/> Use Plg-Rel.Min.Interval f. Inf.Sched. + Bkt-finite Plg | |
| <input checked="" type="checkbox"/> Consider Time Buffer | |
| Pegging | |
| Fixed Pegging | Always Consider |
| Dynamic Pegging | Do Not Consider |
| <input checked="" type="checkbox"/> Consider Time Buffer | |
| <input type="checkbox"/> Consider Resource Network | |
| <input type="checkbox"/> Prod. Storage Defn | |
| <input checked="" type="checkbox"/> Retain Current Modes | |

Figure 9.50 Strategy Parameters for Dependent Objects

| Display Resources: Header Data - Planning Version 000 | | | | | | | | |
|---|---------|------------------|------------|-------|------------------|---------------|--|--|
| | | | | | | | | |
| Capacity Variants Capacity Prof | | | | | | | | |
| 0 Sin... | 1 Multi | 0 Production Lin | 0 Calendar | | | | | |
| Resource | Cat | Location | Time Zone | C... | Factory Calendar | Planner Gr... | | |
| W1710_FA_1710_001 | P | 1710 | PST | ... ▾ | W8 | A | | |

Figure 9.51 Finite Scheduling Indicator in the Resource

The screenshot shows two windows from the SAP S/4HANA interface.

The top window is titled "PP/DS" and contains the following configuration:

- Change Planning Active
- PP/DS Horizon in Days: 999
- Determine Priority:
- Take Safety Stock into Account:
- No Order Without Source of Supply:

The bottom window is titled "No Order Without Source of Supply 4 Entries" and displays a table with the following data:

| No | DefOrd | Short Descript. |
|----|--------|---|
| E | | Order Without Source of Supply Allowed |
| F | | No Order Without Source of Supply with In-House Production |
| X | | No Order Without Source of Supply with External Procurement |
| | | No Order Without Source of Supply Generally |

Figure 9.52 Model Version Management: Order without Source of Supply

Change View "Customizing: Overall Profile": Details

New Entries

| | | |
|-----------------|--------|-------------------------|
| Overall Profile | SAP001 | Default Overall Profile |
| Customizing ID | | |

Specific Settings

| | | |
|------------------|----------------------|--|
| Planning Version | <input type="text"/> | <input type="checkbox"/> Skip Initial Screen |
|------------------|----------------------|--|

Subprofiles

| | | | |
|----------------------|--------|--|--|
| DS Strategy Profile | SAP001 | Standard DS Strategy Profile SAP | |
| PP Strategy Profile | SAP002 | Standard PP Strategy Profile SAP | |
| Plng Board Profile | SAP001 | Standard Prof. 1, DS (Cannot be Changed) | |
| Work Area | SAP001 | All Resources | |
| Time Profile | SAP001 | Planning period -2 to +3 months | |
| Optimization Profile | SAP001 | Standard profile, genetic algorithm | |
| Heuristic Profile | SAP001 | Std heuristic profile, graph. plng board | |
| PP/DS Alert Profile | | | |
| Propagation Range | SAP001 | Propagation range = Work area | |
| Key Figure Schema | | | |

Figure 9.53 Overall Profile for the DS Board

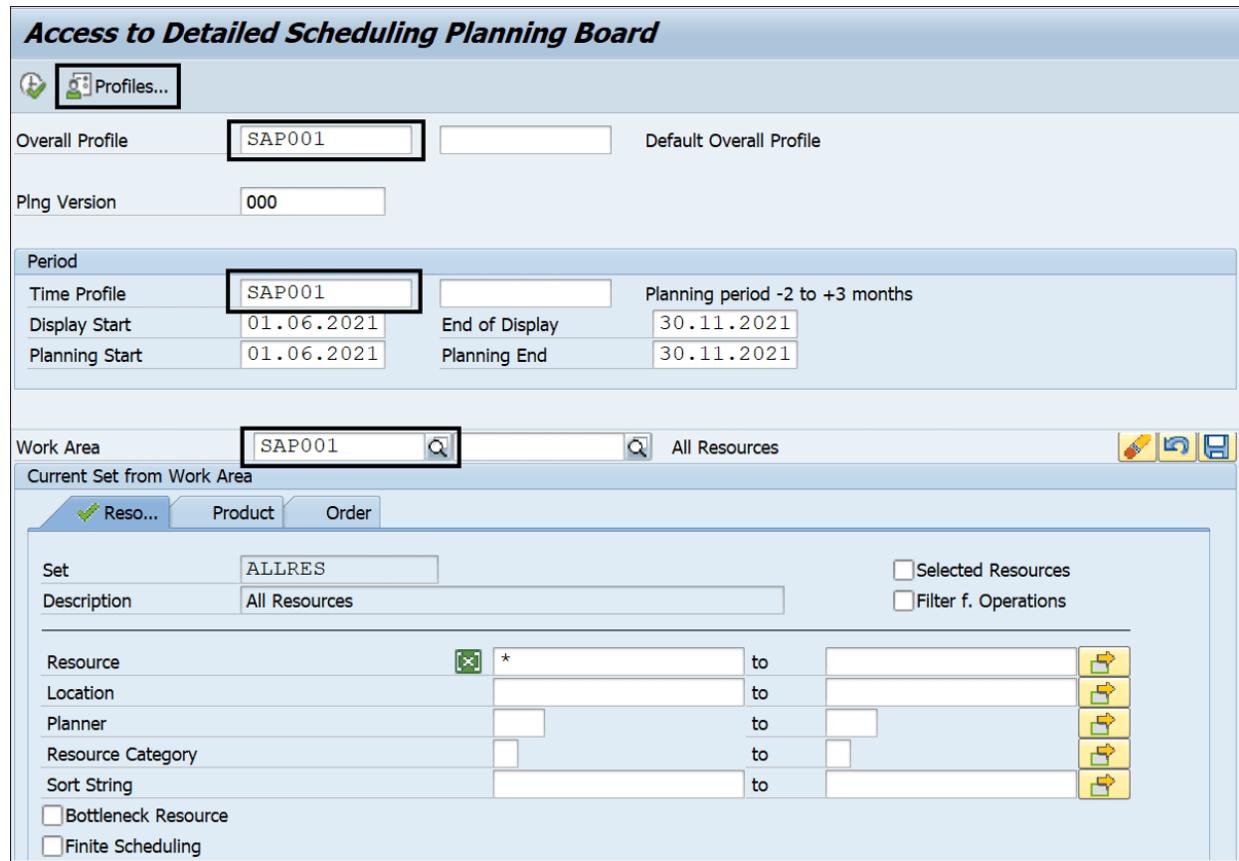


Figure 9.54 Access to the DS Planning Board

The screenshot shows the SAP DS Planning Board Profiles interface. The title bar says "DS Planning Board Profiles". Below it is a navigation bar with tabs: "Plng Board Prfl...", "DS Strategy Profile", "Heuristic Profile", and "More Profiles". The "Plng Board Prfl..." tab is highlighted with a blue border. In the main area, there's a sub-header "Plng Board Prfl" followed by a text input field containing "SAP001". Below this is a table titled "Standard Prof. 1, DS (Cannot be Changed)". The table has columns: "ChartNumbr", "No Display", "Object", and "Short Description". The data rows are:

| ChartNumbr | No Display | Object | Short Description |
|------------|-------------------------------------|-----------|--------------------------|
| 1 | <input type="checkbox"/> | Resource | Resources Chart |
| 2 | <input checked="" type="checkbox"/> | Product | Product Chart |
| 3 | <input checked="" type="checkbox"/> | Order | Orders Chart |
| 4 | <input checked="" type="checkbox"/> | Operation | Operations Chart |
| 5 | <input checked="" type="checkbox"/> | Resource | Resource Utilization |
| 6 | <input type="checkbox"/> | Product | Product Stock |
| 7 | <input checked="" type="checkbox"/> | Operation | Network View: Operations |
| 8 | <input checked="" type="checkbox"/> | Order | Network View: Orders |

Figure 9.55 Charts Selected for Display Based on the DS Planning Board Profile Setup

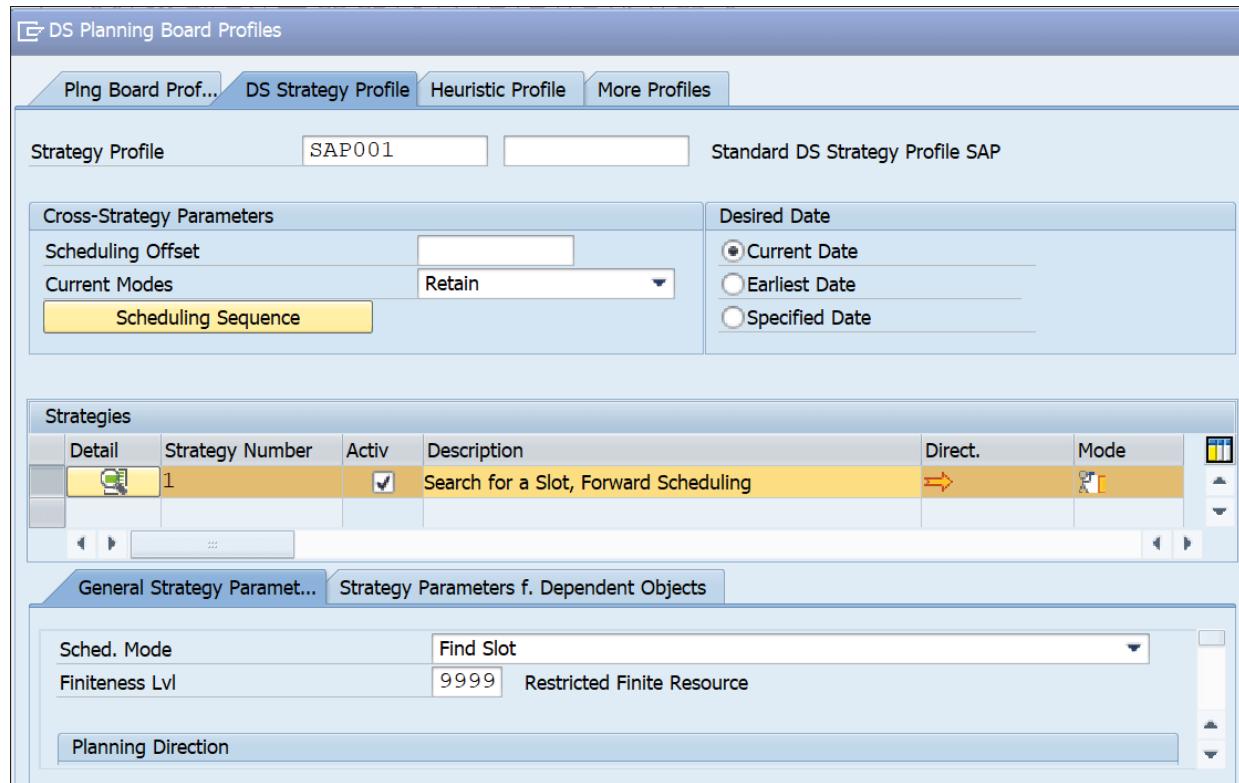


Figure 9.56 DS Strategy Profile

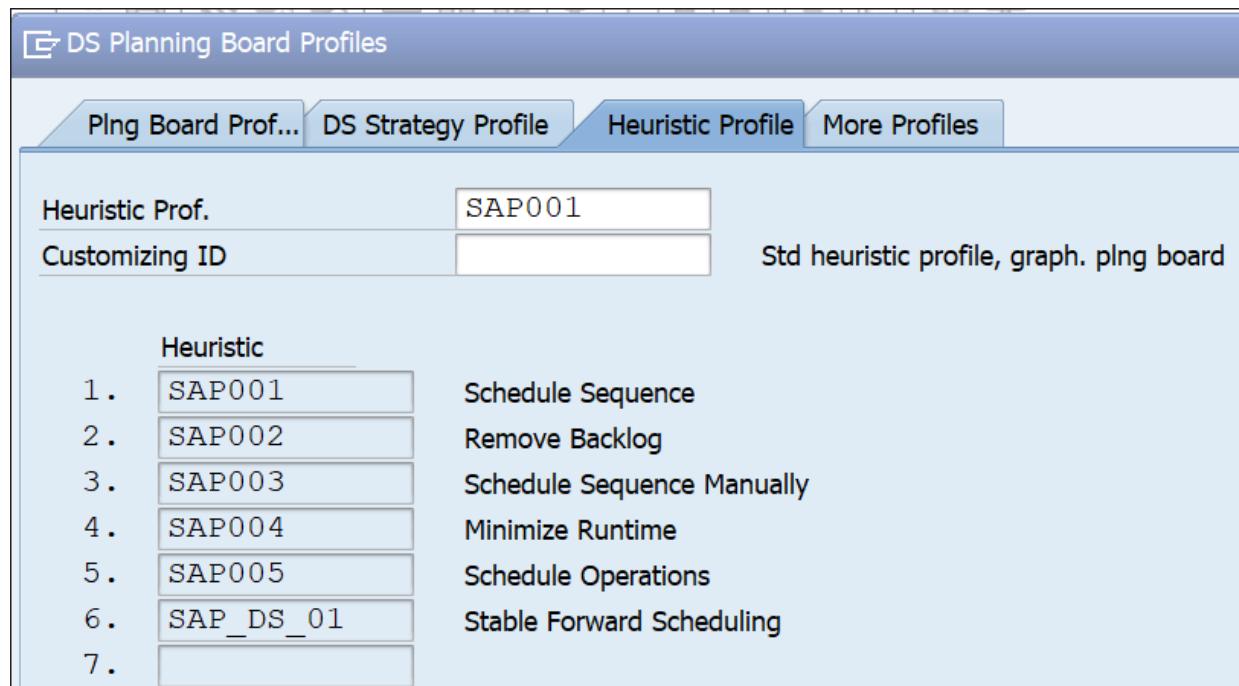


Figure 9.57 Heuristic Profile Assigned to the Overall Profile

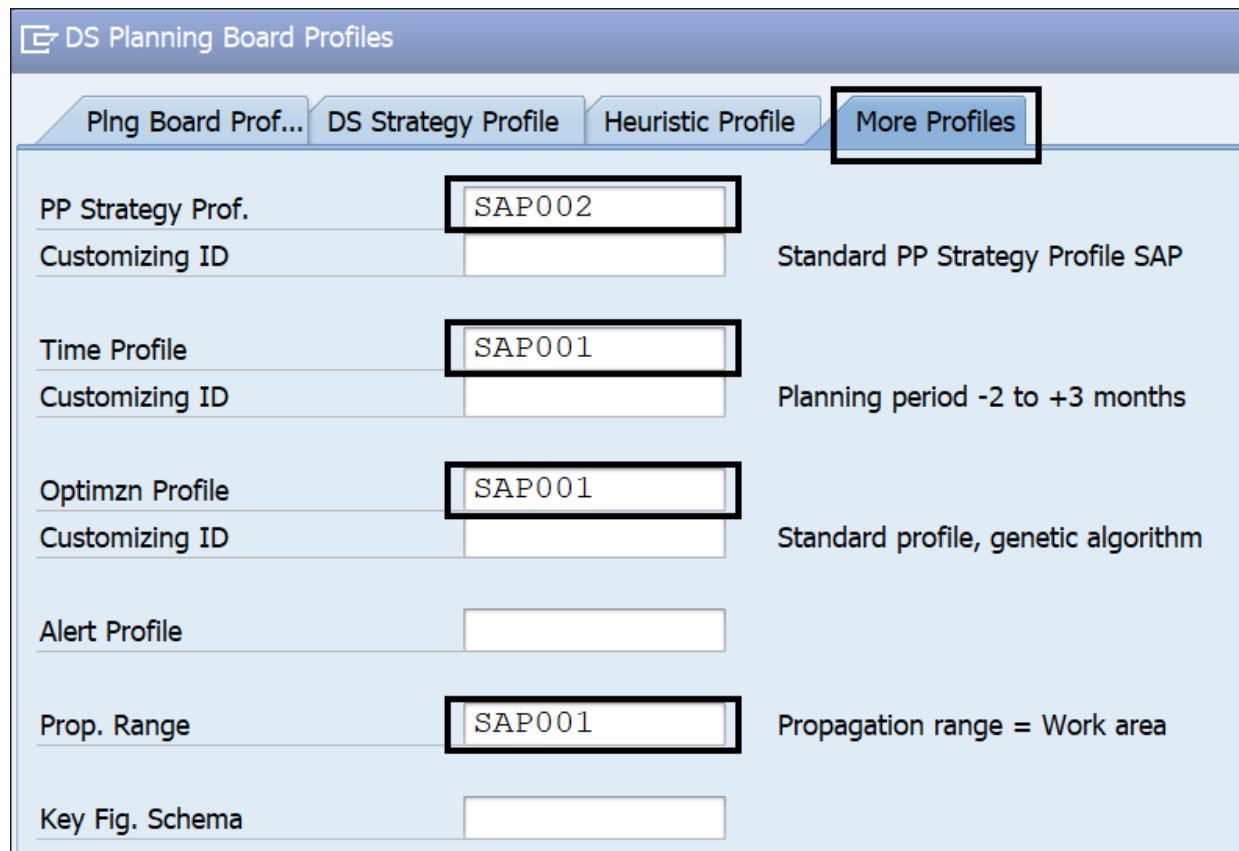


Figure 9.58 More Profiles View of the Overall Profile of the DS Board

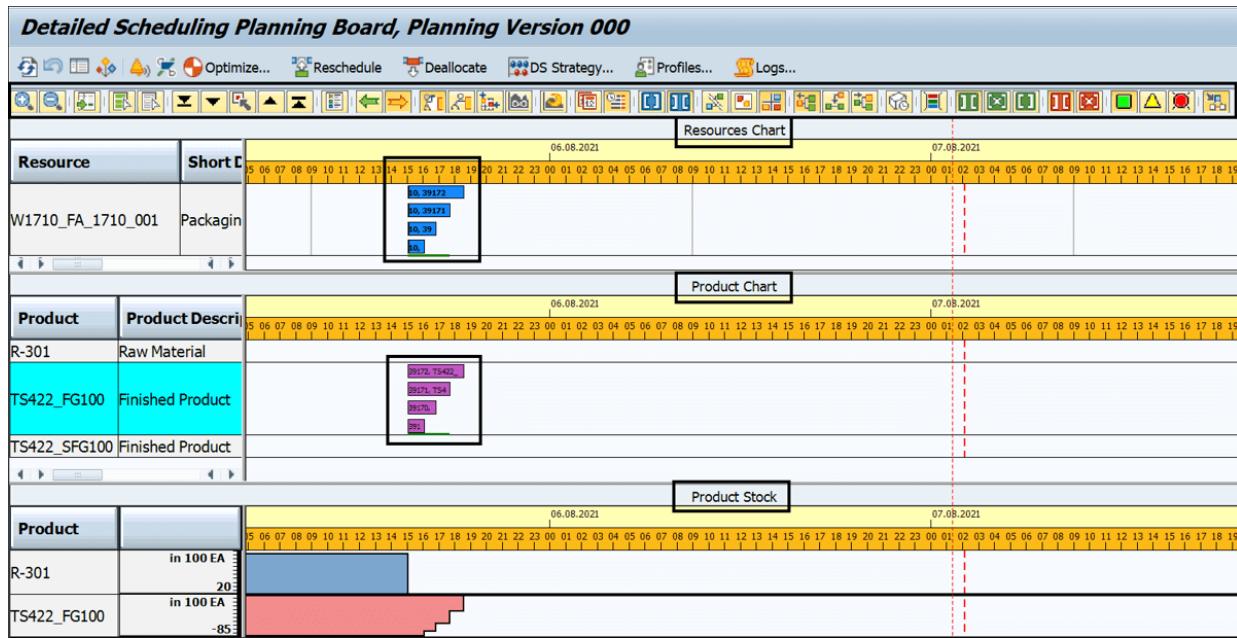


Figure 9.59 DS Planning Board

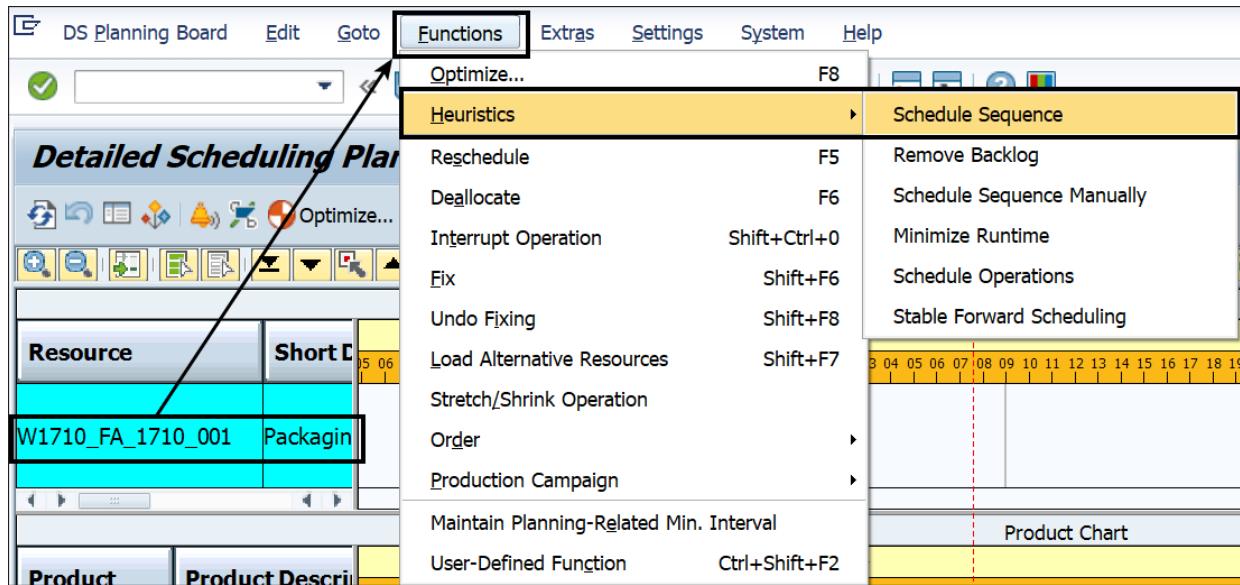


Figure 9.60 Executing Scheduling Heuristics in the DS Board

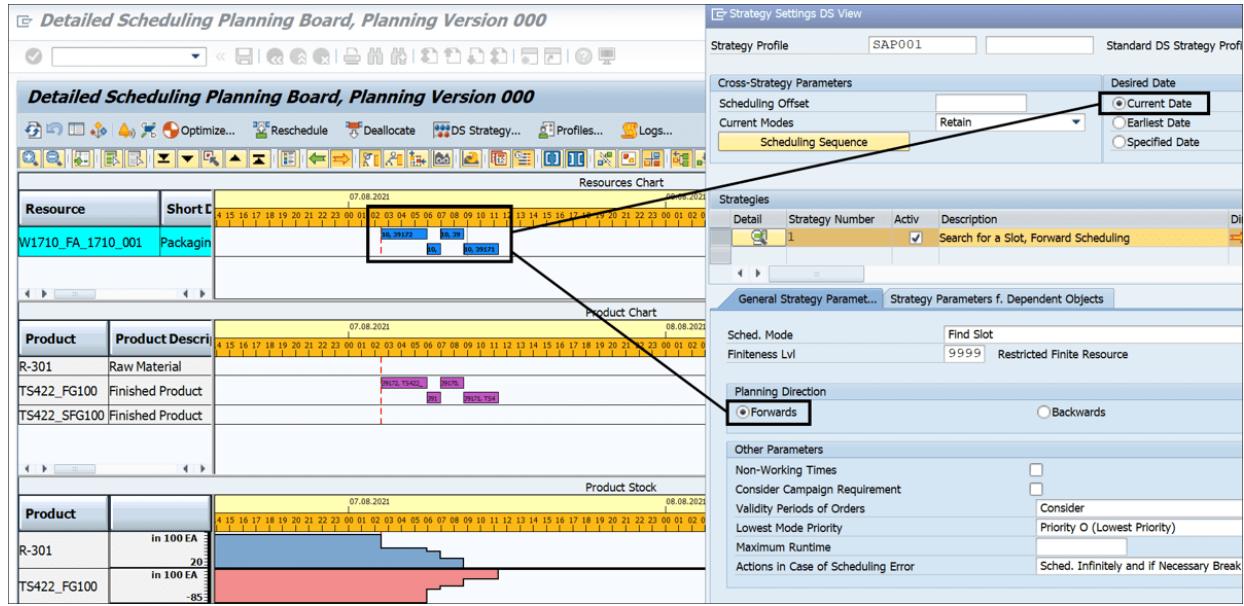


Figure 9.61 Order Sequencing in the DS Board

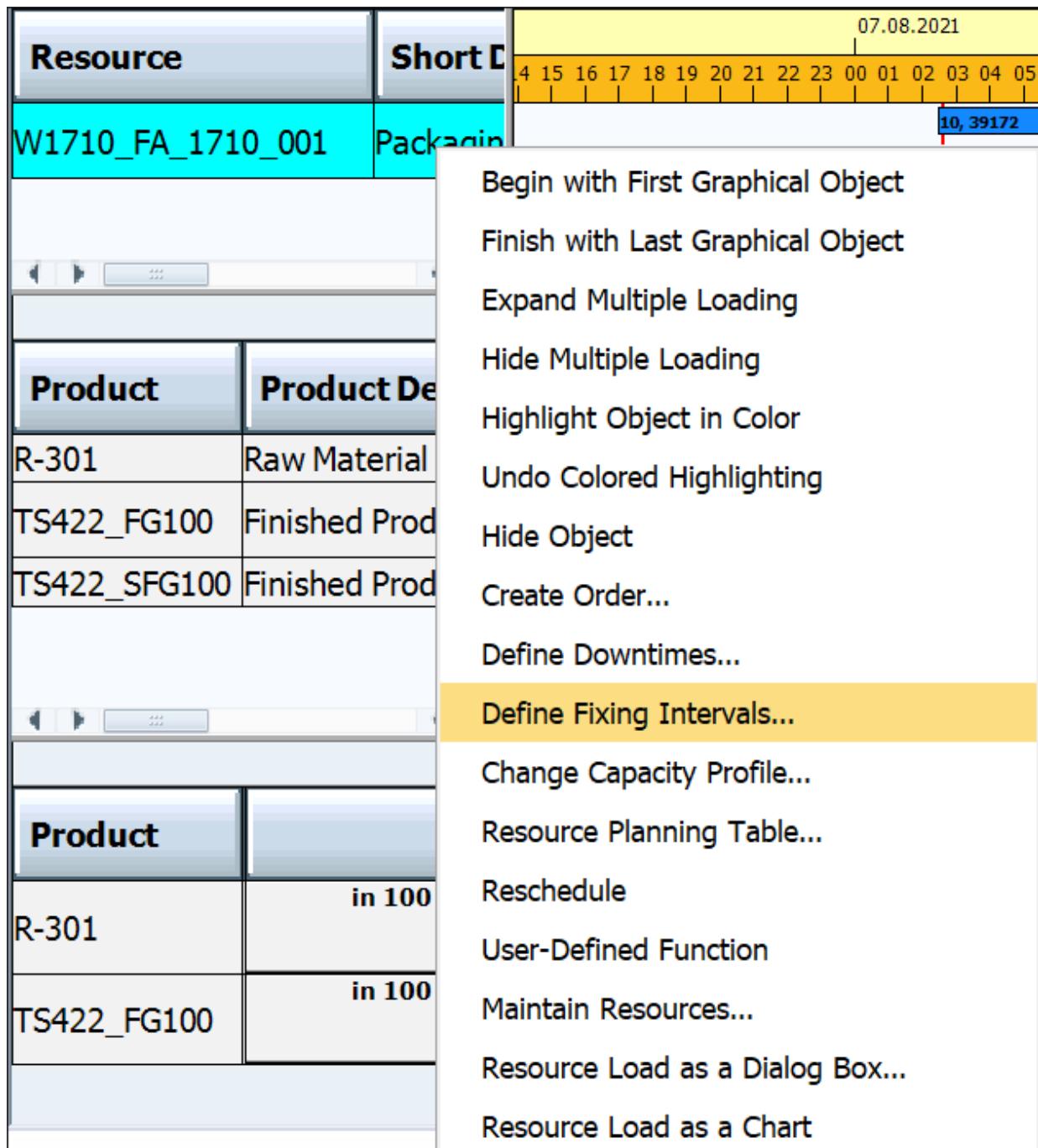


Figure 9.62 Select Fixing Interval for Orders on a Resource

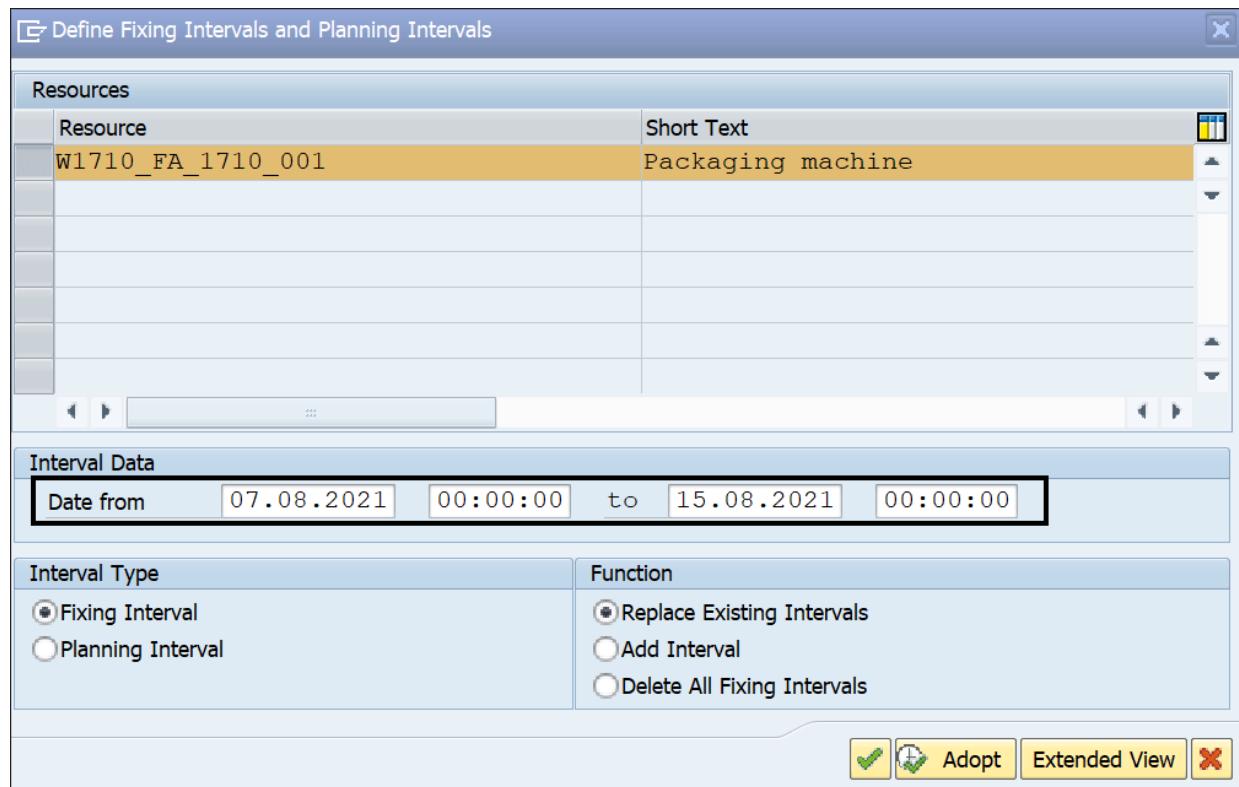


Figure 9.63 Enter Fixing Interval

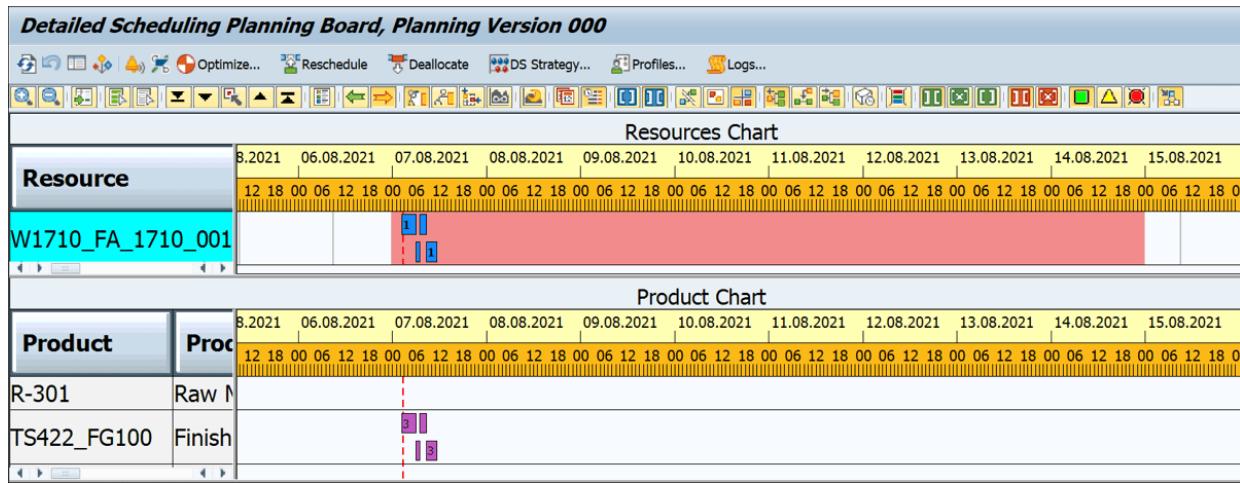


Figure 9.64 Fixed Interval in the DS Board



Figure 9.65 Saving the DS Board Results

Mass Conversion/Transfer of Orders in Active Planning Version

| | | | | |
|--|---|----|----------------------|---|
| Product Number | TS422_FG100 | to | <input type="text"/> |  |
| Location | 1710 | to | <input type="text"/> |  |
| Offset for Opening Period | 1,00 | | | |
| Number of Production Campaign | <input type="text"/> | to | <input type="text"/> |  |
| <input checked="" type="checkbox"/> In-House Production Orders | | | | |
| Selection Criteria for In-House Production Orders | | | | |
| Start Date (Instd of Opening) | <input type="text"/> | to | <input type="text"/> |  |
| Production Planner | <input type="text"/> | to | <input type="text"/> |  |
| <input checked="" type="checkbox"/> Only Scheduled Orders | | | | |
| <input type="checkbox"/> External Procurement Orders | | | | |
| Selection Criteria for External Procurement Orders | | | | |
| Purchasing Group | <input type="text"/> | to | <input type="text"/> |  |
| Further Selection Criteria | | | | |
| Special Stock | <input type="text"/> | | | |
| Source | <input type="text"/> | to | <input type="text"/> |  |
| Resource | <input type="text"/> | to | <input type="text"/> |  |
| Planner Group | <input type="text"/> | to | <input type="text"/> |  |
| <input type="checkbox"/> Only Orders with Firmed Output | | | | |
| <input checked="" type="radio"/> Convertible Orders | <input type="radio"/> Transferable Orders | | | |
| <input checked="" type="checkbox"/> Consider Conversion Rule | <input type="checkbox"/> Only Prev. Not Trans. Orders | | | |
| Execution Options | | | | |
| <input type="radio"/> Display | <input checked="" type="radio"/> Transfer or Convert | | | |
| <input checked="" type="checkbox"/> P_LOGDIS | | | | |

Figure 9.66 Mass Conversion/Transfer of Orders in PP-DS

| Simulation Version | | | | | | | | |
|---------------------------|--------------|-------------------------|------------|---------------|-----------------|-------------|------------|----------|
| Process in Graphic Form | | Process in Tabular Form | | Adopt | Copy | Delete | | |
| Simulation Version | Plng Version | Sim. Version Owner | Created on | Creation time | Last Changed By | Change date | Changed at | |
| 0001 | 000 | GAUTOUSER3_B | 07.08.2021 | 03:25:27 | | | | 00:00:00 |

Figure 9.67 Simulation Version

Alert Monitor

Redetermine Alerts Alert Profile Favorite Management

Favorites PP/DS_OVERALL (Overall alert for PP/DS)

Alert Monitor : Overall alert for PP/DS (Alert Monitor)

Redetermine Alerts Alert Profile Favorite Management

Favorites PP/DS_OVERALL (Overall alert for PP/DS)

Select Alert Views

- Location Product View
- Finished Product
- Plant 1 US

| Selection | 36 | 0 | 0 |
|-------------------------------------|----|---|---|
| <input type="checkbox"/> | 36 | 0 | 0 |
| <input type="checkbox"/> | 36 | 0 | 0 |
| <input checked="" type="checkbox"/> | 36 | 0 | 0 |

Requirement/Receipt Alerts (8 Alerts)

| Status | Priority | Priority Description | Ping | Versn | Item Numbr | Schd.Ln.No | Priority | Scheduled | Cat | Product Number | Prod.Desc. | Location | Loc. desc. | Order | Input Resource |
|--------|----------|--------------------------------------|------|-------|------------|------------|----------|--------------|------------------|----------------|--|---------------|------------|-------|----------------|
| 1 | 1 | Product too late (dynamic pegging) | 000 | 1 | 0 | 0 X | FA | TS422_FG100 | Finished Product | 1710 | Plant 1 US Forecast | | | | |
| 1 | 1 | Product too late (dynamic pegging) | 000 | 0001 | | 0 X | AY | TS422_SFG100 | Finished Product | 1710 | Plant 1 US Planned Order 0000039170 (In-House) | W1710_FA_1710 | | | |
| 1 | 1 | Product too late (dynamic pegging) | 000 | 0001 | | 0 X | AY | TS422_SFG100 | Finished Product | 1710 | Plant 1 US Planned Order 0000039170 (In-House) | W1710_FA_1710 | | | |
| 1 | 1 | Product too late (dynamic pegging) | 000 | 0001 | | 0 X | AY | TS422_SFG100 | Finished Product | 1710 | Plant 1 US Planned Order 0000039170 (In-House) | W1710_FA_1710 | | | |
| 1 | 1 | Percent due date/time violated (dyn) | 000 | 0000 | | 0 X | AT | TS422_FG100 | Finished Product | 1710 | Plant 1 US Planned Order 0000039170 (In-House) | | | | |

Order in Past Alerts (28 Alerts)

| Status | Priority | Priority Description | Ping | Versn | Order | Priority | Scheduled | Cat | PP-Firmed Conv. | Ind. | Item Numbr | Schd.Ln.No | Product Number | Prod.Desc. | Location | Loc. desc. | Vendor |
|--------|----------|--------------------------|------|-------------------------------------|-------|----------|-----------|--------------|------------------|------|------------|------------|----------------|------------|----------|------------|--------|
| 1 | 1 | Opening date in the past | 000 | Planned Order 0000039316 (In-House) | 0 X | AI | 0000 | TS422_FG100 | Finished Product | 1710 | Plant 1 US | 1710 | | | | | |
| 1 | 1 | Opening date in the past | 000 | Planned Order 0000039317 (In-House) | 0 X | AI | 0000 | TS422_FG100 | Finished Product | 1710 | Plant 1 US | 1710 | | | | | |
| 1 | 1 | Opening date in the past | 000 | Planned Order 0000039318 (In-House) | 0 X | AI | 0000 | TS422_SFG100 | Finished Product | 1710 | Plant 1 US | 1710 | | | | | |
| 1 | 1 | Opening date in the past | 000 | Planned Order 0000039319 (In-House) | 0 X | AI | 0000 | TS422_SFG100 | Finished Product | 1710 | Plant 1 US | 1710 | | | | | |
| 1 | 1 | Opening date in the past | 000 | Planned Order 0000039320 (In-House) | 0 X | AI | 0000 | TS422_SFG100 | Finished Product | 1710 | Plant 1 US | 1710 | | | | | |

Figure 9.68 Overall Alerts for PP-DS (Alert Monitor)

Product View: TS422_FG100, Planning Version 000

The screenshot shows the SAP Alert Monitor interface. At the top, there's a toolbar with various icons. Below it, a navigation bar displays 'Product TS422_FG100' and 'Location 1710'. A dropdown menu labeled 'Strategy' is open. A red box highlights the 'Strategy' icon in the toolbar and the 'Strategy' item in the dropdown menu.

Select Alert Views

| Selection | 20 | 0 | 0 |
|--|----|---|---|
| <input type="checkbox"/> Location Product View | 20 | 0 | 0 |
| <input checked="" type="checkbox"/> Finished Product | 20 | 0 | 0 |
| <input checked="" type="checkbox"/> Plant 1 US | 20 | 0 | 0 |

Requirement/Receipt Alerts (12 Alerts)

| Status | Priority | Priority Description | Ping Versn | Item Numbr | Schd.Ln.No | Priority | Scheduled Cat | Product Number | Prod.Desc. | Location | Loc. desc. | Order | Inp.Res.Inp. |
|--------|----------|--|------------|------------|------------|----------|---------------|----------------|------------------|----------|--|-------|--------------|
| 1 | 1 | Product too late (dynamic pegging) | 000 | 1 | 0 | 0 X | FA | TS422_FG100 | Finished Product | 1710 | Plant 1 US Forecast | | |
| 1 | 1 | Product too late (dynamic pegging) | 000 | 1 | 0 | 0 X | FA | TS422_FG100 | Finished Product | 1710 | Plant 1 US Forecast | | |
| 1 | 1 | Product too late (dynamic pegging) | 000 | 1 | 0 | 0 X | FA | TS422_FG100 | Finished Product | 1710 | Plant 1 US Forecast | | |
| 1 | 1 | Product too late (dynamic pegging) | 000 | 1 | 0 | 0 X | FA | TS422_FG100 | Finished Product | 1710 | Plant 1 US Forecast | | |
| 1 | 1 | Product too late (dynamic pegging) | 000 | 1 | 0 | 0 X | FA | TS422_FG100 | Finished Product | 1710 | Plant 1 US Forecast | | |
| 1 | 1 | Product too late (dynamic pegging) | 000 | 1 | 0 | 0 X | FA | TS422_FG100 | Finished Product | 1710 | Plant 1 US Forecast | | |
| 1 | 1 | Receipt due/date/time violated (dynamic pegging) | 0000 | 0000 | | 0 X | AI | TS422_FG100 | Finished Product | 1710 | Plant 1 US Planned Order 0000039171 (In-House) | | |
| 1 | 1 | Receipt due/date/time violated (dynamic pegging) | 0000 | 0000 | | 0 X | AI | TS422_FG100 | Finished Product | 1710 | Plant 1 US Planned Order 0000039170 (In-House) | | |
| 1 | 1 | Receipt due/date/time violated (dynamic pegging) | 0000 | 0000 | | 0 X | AI | TS422_FG100 | Finished Product | 1710 | Plant 1 US Planned Order 0000039171 (In-House) | | |
| 1 | 1 | Receipt due/date/time violated (dynamic pegging) | 0000 | 0000 | | 0 X | AI | TS422_FG100 | Finished Product | 1710 | Plant 1 US Planned Order 0000039169 (In-House) | | |
| 1 | 1 | Receipt due/date/time violated (dynamic pegging) | 0000 | 0000 | | 0 X | AI | TS422_FG100 | Finished Product | 1710 | Plant 1 US Planned Order 0000039170 (In-House) | | |

Order in Past Alerts (8 Alerts)

| Status | Priority | Priority Description | Ping Versn | Order | Priority | Scheduled Cat | PP-Firmed Conv. | Ind. | Item Numbr | Schd.Ln.No | Product Number | Prod.Desc. | Location | Loc. desc. | Vendor |
|--------|----------|-----------------------------------|------------|-------------------------------------|----------|---------------|-----------------|------|------------|------------|----------------|------------------|----------|-----------------|--------|
| 1 | 1 | Receipt due/date/time in the past | 000 | Planned Order 0000039169 (In-House) | 0 X | AI | X | X | 0000 | | TS422_FG100 | Finished Product | 1710 | Plant 1 US 1710 | |
| 1 | 1 | Receipt due/date/time in the past | 000 | Planned Order 0000039170 (In-House) | 0 X | AI | X | X | 0000 | | TS422_FG100 | Finished Product | 1710 | Plant 1 US 1710 | |
| 1 | 1 | Receipt due/date/time in the past | 000 | Planned Order 0000039171 (In-House) | 0 X | AI | X | X | 0000 | | TS422_FG100 | Finished Product | 1710 | Plant 1 US 1710 | |
| 1 | 1 | Receipt due/date/time in the past | 000 | Planned Order 0000039172 (In-House) | 0 X | AI | X | X | 0000 | | TS422_FG100 | Finished Product | 1710 | Plant 1 US 1710 | |
| 1 | 1 | Start date in the past | 000 | Planned Order 0000039169 (In-House) | 0 X | AI | X | X | 0000 | | TS422_FG100 | Finished Product | 1710 | Plant 1 US 1710 | |
| 1 | 1 | Start date in the past | 000 | Planned Order 0000039170 (In-House) | 0 X | AI | X | X | 0000 | | TS422_FG100 | Finished Product | 1710 | Plant 1 US 1710 | |
| 1 | 1 | Start date in the past | 000 | Planned Order 0000039171 (In-House) | 0 X | AI | X | X | 0000 | | TS422_FG100 | Finished Product | 1710 | Plant 1 US 1710 | |
| 1 | 1 | Start date in the past | 000 | Planned Order 0000039172 (In-House) | 0 X | AI | X | X | 0000 | | TS422_FG100 | Finished Product | 1710 | Plant 1 US 1710 | |

Figure 9.69 Assign an Alert Profile to the Product View Application

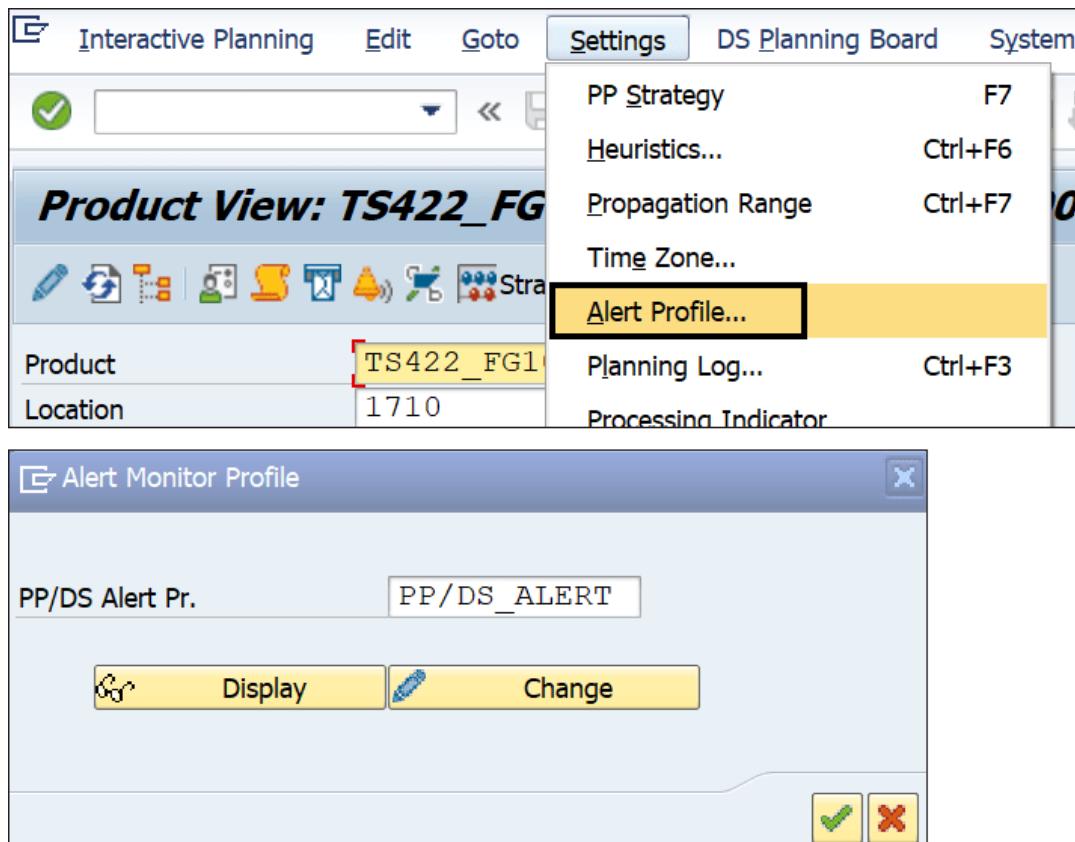


Figure 9.70 Application-Specific Alert for PP-DS

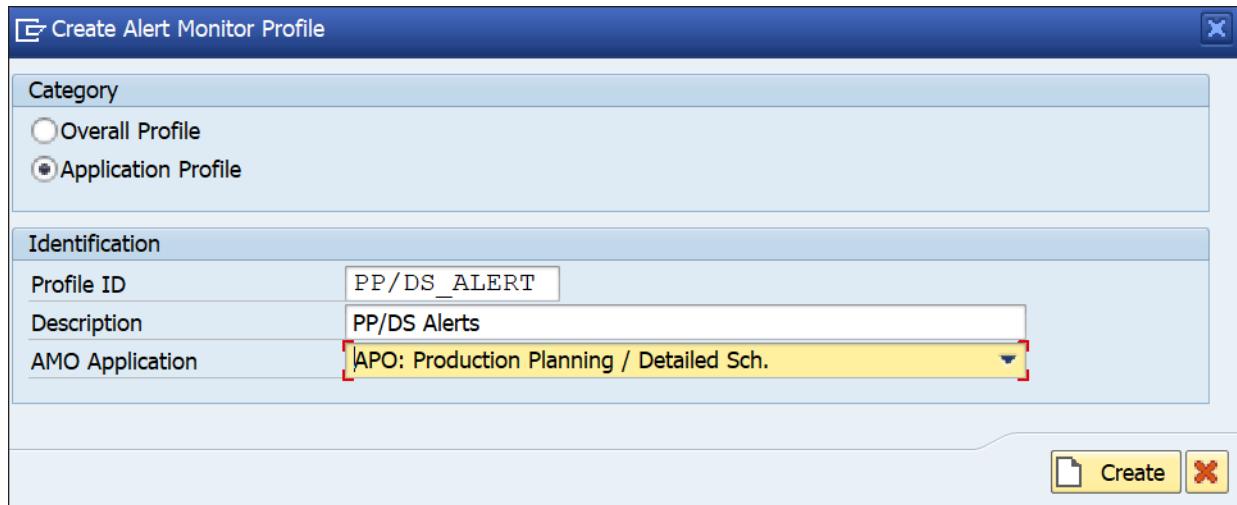


Figure 9.71 Create an Alert Monitor Application Profile

Alert Profile PP/DS_ALERT Saved
AMO Application APO: Production Planning / Detailed Sch.

Attribut... Selection Overall Alert Profile Assignment

Select Alert Types

| Alert Types | Selection | DP | Threshold Val... | OP | | |
|--|-------------------------------------|----|----------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| - Requirement/Receipt Alerts | <input type="checkbox"/> | | | | | |
| · Product too late (fixed pegging) | <input type="checkbox"/> | | Delay in h > | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> |
| · Receipt due date/time violated (fixed pegging) | <input type="checkbox"/> | | Delay in h > | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> |
| · Product too late (dynamic pegging) | <input checked="" type="checkbox"/> | | Delay in h > | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> | <input type="text" value="1,00"/> |
| · Receipt due date/time violated (dynamic pegging) | <input checked="" type="checkbox"/> | | Delay in h > | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> | <input type="text" value="1,00"/> |
| · Product too early (fixed pegging) | <input type="checkbox"/> | | Date/time too e... > | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> |
| · Receipt due date/time too early (fixed pegging) | <input type="checkbox"/> | | Date/time too e... > | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> | <input type="text" value="0,00"/> |

Network Alerts

Display Requirements with Problems in Order Network Search Depth
 Display Receipts with Problems in Order Network Explode RPM Reqs

Selection of Location Products

Location Products

Days' Supply Alerts

| | | |
|------------------------------|------------------|---|
| Different Days' Supply Types | Customizing Vals | Orders in Past |
| Days'Sup.Type 1 | SAP1 DaysSupply | Start Past (in Days) |
| Days'Sup.Type2 | SAP2 ReceiptDS | Overconfirmation/Underconfirmation Alerts |
| Days'Sup.Type3 | | PeriodType |

Supply Shortage Alerts

No Supply Shortage Alerts Outside Planned Delivery Time
 Take Account of Underdelivery Tolerance

Requirement/Receipt Alerts

Hide Alerts of Type "Product/Receipt Date/Time Too Early"

Selection of Resources

Resources
Locations

Figure 9.72 Alert Profile Maintenance (PP-DS Alert)

| Selection Object TS422* | | | | | |
|-------------------------|----------|----|--|------------|----------|
| Selection Parameters | From | To | | Value From | Value To |
| - Selection Dimensions | | | | | |
| - Products | | | | | |
| - Product Number | ✓ TS422* | | | TS422* | |
| - Matl Group | | | | | |
| - Proc. type | | | | | |
| - Purchasing Group | | | | | |
| - Locations | | | | | |
| - Location Name | ✓ 1710 | | | | |
| - Location Type | | | | | |
| - Planner | | | | | |
| - Production Planner | | | | | |
| - SNP Planner | | | | | |
| - SNC Planner | | | | | |

| Selection Object TS422* | | | | | |
|-------------------------|----------|----|--|------------|----------|
| Selection Parameters | From | To | | Value From | Value To |
| - Selection Dimensions | | | | | |
| - Products | | | | | |
| - Product Number | ✓ TS422* | | | 1710 | |
| - Matl Group | | | | | |
| - Proc. type | | | | | |
| - Purchasing Group | | | | | |
| - Locations | | | | | |
| - Location Name | ✓ 1710 | | | | |
| - Location Type | | | | | |
| - Planner | | | | | |
| - Production Planner | | | | | |
| - SNP Planner | | | | | |
| - SNC Planner | | | | | |

Figure 9.73 Define Selection for Alert Definition (Location Product)

Overall Alert Profile PP/DS_OVERALL Changed

Attribut... Setting

Planning Version 000 Active Version

Period

Relative Time Interval Absolute Time Interval

| | | | |
|--|---|------------|---|
| <input type="radio"/> Months | | Offset (m) | |
| <input checked="" type="radio"/> Weeks | 1 | Offset (w) | 2 |
| <input type="radio"/> Days | | Offset (d) | |
| <input type="radio"/> Hours | | Offset (h) | |

Start 00:00
End Date 00:00

Application-Specific Alert Profiles

| Appl... | Application Description | Alert Profile | Description |
|---------|--|---------------|--------------|
| | APO: Production Planning / Detailed Sch. | PP/DS_ALERT | PP/DS Alerts |
| | Warehouse Management | | |

Figure 9.74 Overall Alert Profile Maintenance

| Plnd Ind. Reqmts Display: Planning Table | | | | | | | | | | | | |
|--|-------------|------------|--------------|-------------------------------------|------------|----------------|-----------|----------------|-----------|-----------|-----------|-----------|
| Compare History | | | | | | | | | | | | |
| Planning start | | 01.08.2021 | Planning End | | 17.09.2022 | | | | | | | |
| Table | | | | Items | | | | Schedule Lines | | | | |
| | | | | | | | | | | | | |
| | Material | MRP A... | V | A | BU | Reqmnt Segment | W 36.2021 | W 37.2021 | W 38.2021 | W 39.2021 | W 40.2021 | W 41.2021 |
| | TS422_FG101 | 1710 | 00 | <input checked="" type="checkbox"/> | PC | | 5,000 | 5,500 | 7,000 | 8,500 | 5,250 | 3,500 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Figure 9.75 Maintaining PIRs

SAP Copy Job: Creation of pMRP Data via Top-Level Materials ▾

Creation of pMRP Data via Top-Level M...

1 Template Selection 2 Scheduling Options 3 Parameters

1. Template Selection

Job Template: * Creation of pMRP Data via Top-Level Materials

Job Name: Creation of pMRP Data via Top-Level Materials

2. Scheduling Options

Start Immediately: Recurrence Pattern: Single Run

Start: 13.08.2021, 14:58:08

3. Parameters

Parameter Section

| Reference and Bucket Definition | Simulation Name |
|---|--|
| ID for Reference Data: * TS422_PMRP_TOPMAT_06 | Simulation ID: * TS422_TOPMAT_SIMU_06 |
| Reference Description: | Simulation Description: TS422_pMRP_TopMat_Sumulation |
| Bucket Category: * W | Limitations |
| Start Date of Reference: * 01.09.2021 | Plant-Specific Material Status: |
| End Date of Reference: * 30.09.2021 | Cross-Plant Material Status: |

Figure 9.76 Step 1 and 2 of the Job Template

| | | | |
|--|------------------------------------|--|------------------------------------|
| Object Selection | | Stock Transfer Behavior | |
| Plant:* | 1710 | BOM Usage: | <input type="button" value="..."/> |
| Material: | TS422_FG101 | Task List Usage: | <input type="button" value="..."/> |
| MRP Controller: | <input type="button" value="..."/> | BOM Status: | <input type="button" value="..."/> |
| Material type: | <input type="button" value="..."/> | Routing Status: | <input type="button" value="..."/> |
| Low-Level Code: | <input type="button" value="..."/> | Stock Transfer from/ to Plants: <input type="checkbox"/> | |
| Work Center Group Type: | <input type="button" value="..."/> | Considered Plants: | <input type="text"/> |
| Additional MRP Types: | <input type="button" value="..."/> | Considered Work Centers: | <input type="text"/> |
| BOM Selection ID: | <input type="button" value="..."/> | Document Data | |
| | | Opening Stock: | <input type="button" value="..."/> |
| | | Consider Inactive PIRs: | <input type="checkbox"/> |
| | | Consider Inactive PIR Versions: | <input type="button" value="..."/> |
| | | Ignore Active PIRs: | <input type="checkbox"/> |
| | | Ignore Active PIR Versions: | <input type="button" value="..."/> |
| | | Ignore Sales Demands: | <input type="checkbox"/> |
| | | Consider Simp. Discontinuation: | <input type="checkbox"/> |
| Schedule Check Template Cancel | | | |

Figure 9.77 Step 3 of the Job Template for Object Selection Based on Material

| | | |
|---------------------------------|---|--|
| Object Selection | | Stock Transfer Behavior |
| Plant: [*] | <input type="text" value="1710"/> | <input type="checkbox"/> Stock Transfer from/ to Plants: |
| Work center: | <input type="text" value="Assembly"/> | <input type="checkbox"/> Considered Plants: |
| Work Center Category: | <input type="text"/> | <input type="checkbox"/> Considered Plants and Work Centers: |
| Person Responsible: | <input type="text"/> | |
| Work Center Group Type: | <input type="text"/> | |
| Additional MRP Types: | <input type="text"/> | |
| BOM Selection ID: | <input type="text"/> | |
| 1 | | |
| Object Selection | | Stock Transfer Behavior |
| Plant: [*] | <input type="text" value="1710"/> | <input type="checkbox"/> Stock Transfer from/ to Plants: |
| Material: | <input type="text" value="TS422_SFG103"/> | <input type="checkbox"/> Considered Plants: |
| MRP Controller: | <input type="text"/> | <input type="checkbox"/> Considered Work Centers: |
| Material type: | <input type="text"/> | |
| Low-Level Code: | <input type="text"/> | |
| Work Center Group Type: | <input type="text"/> | |
| Additional MRP Types: | <input type="text"/> | |
| BOM Selection ID: | <input type="text"/> | |
| 2 | | |
| Document Data | | |
| Opening Stock: | <input type="text"/> | |
| Consider Inactive PIRs: | <input type="checkbox"/> | |
| Consider Inactive PIR Versions: | <input type="checkbox"/> | |
| Ignore Active PIRs: | <input type="checkbox"/> | |
| Ignore Active PIR Versions: | <input type="checkbox"/> | |
| Ignore Sales Demands: | <input type="checkbox"/> | |
| Consider Simp. Discontinuation: | <input type="checkbox"/> | |

Figure 9.78 Job Template for Object Selection Based on Work Centers and Components

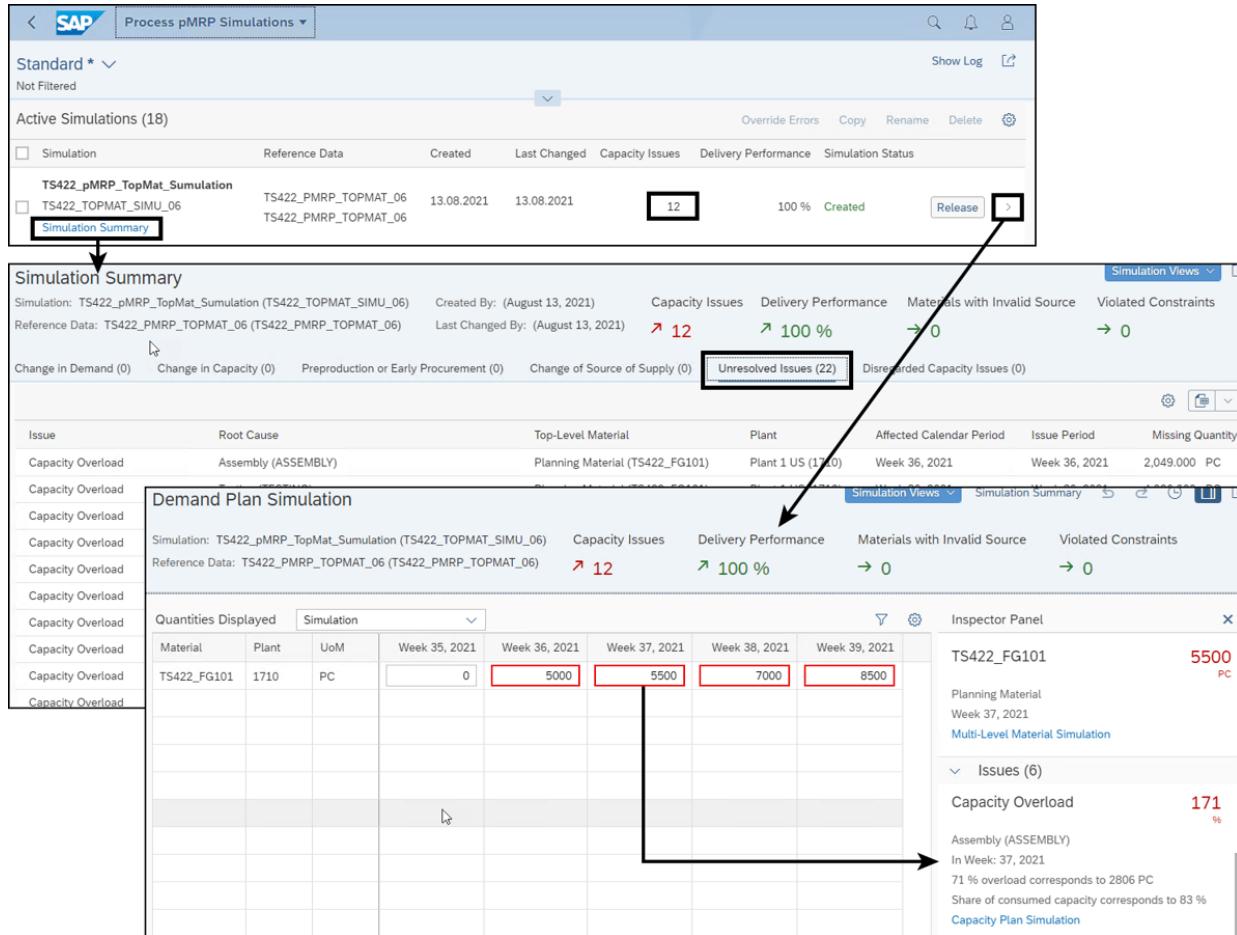


Figure 9.79 Process pMRP Simulations with “Simulation Summary and Details”

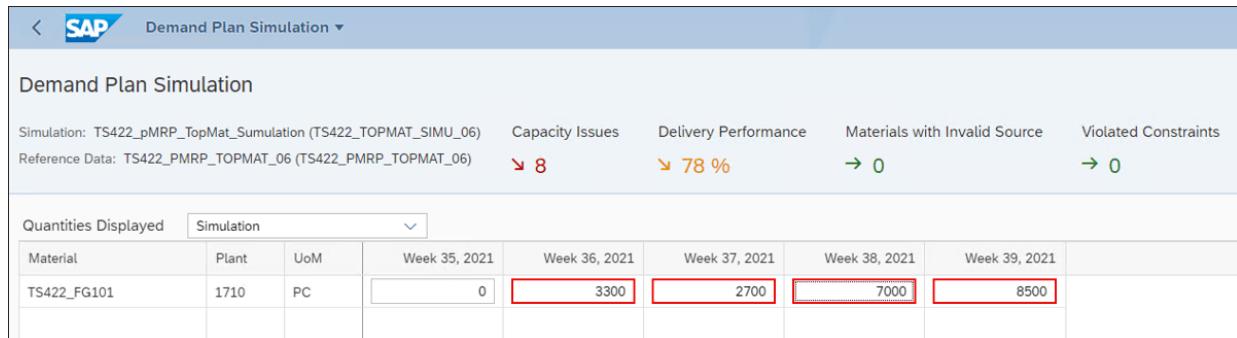


Figure 9.80 Adjust (Independent) Demand in Week 36 and Week 37

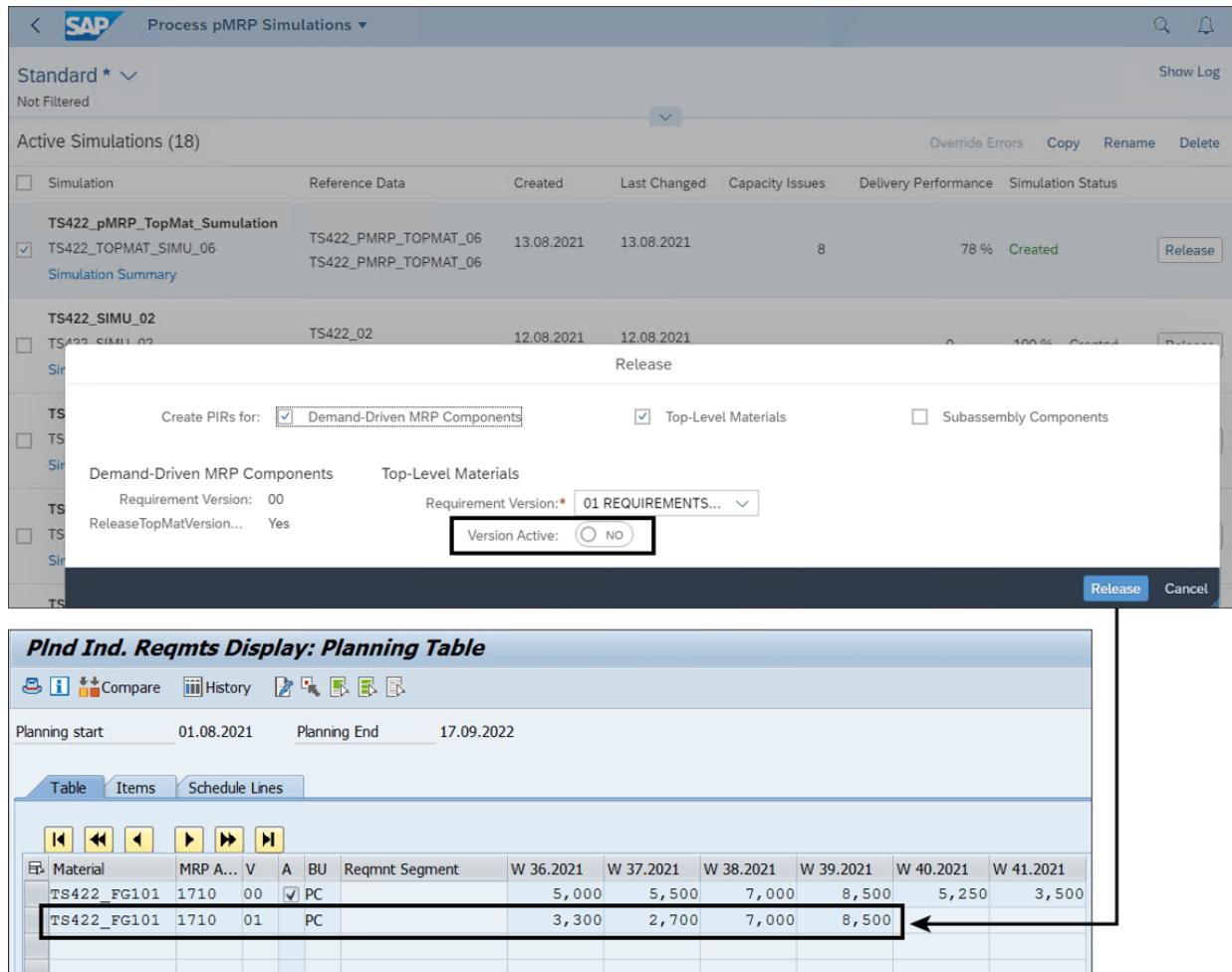


Figure 9.81 Release the pMRP Simulation to the MRP Operative or Inactive Version

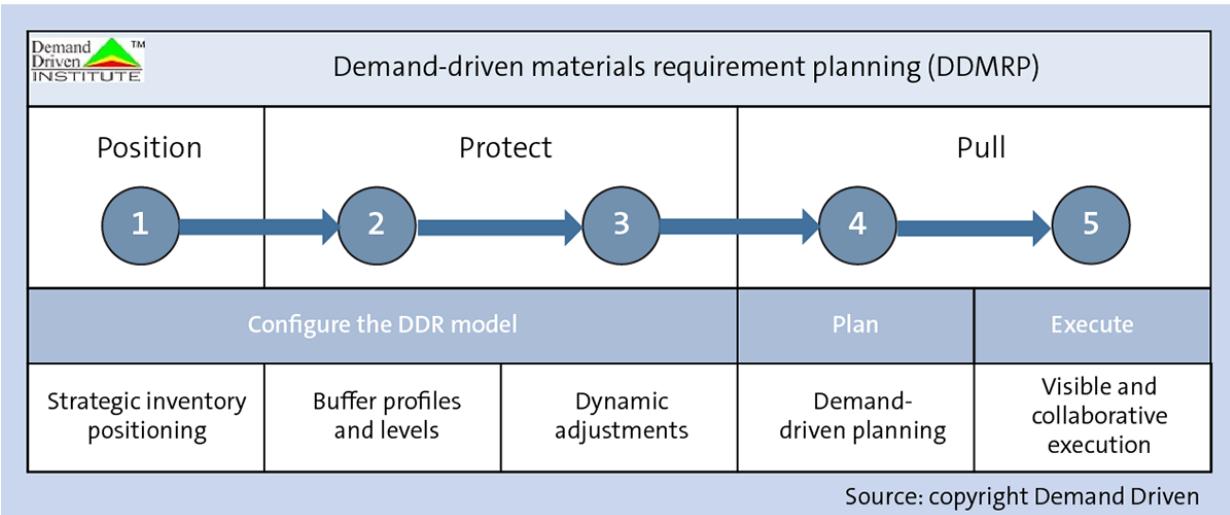


Figure 9.82 Five Components of DDMRP

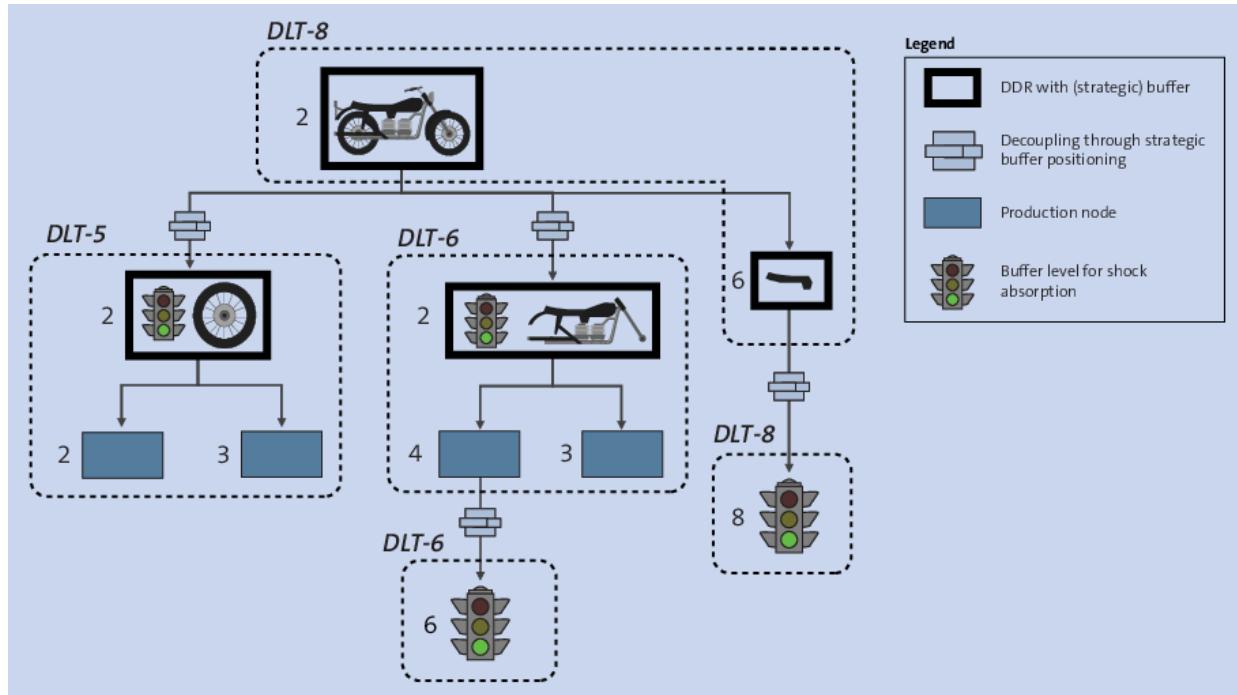


Figure 9.83 Decoupled Lead Times (DLT) Based on Decoupling Points

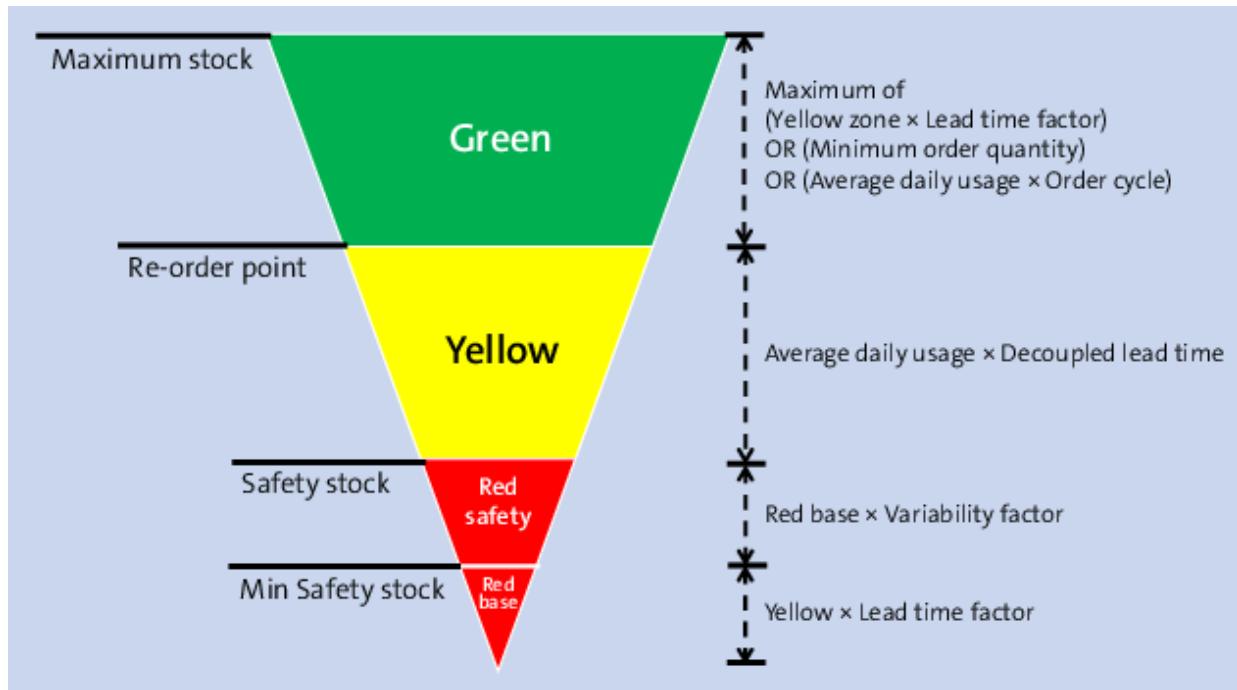


Figure 9.84 Buffer Profiles in DDR

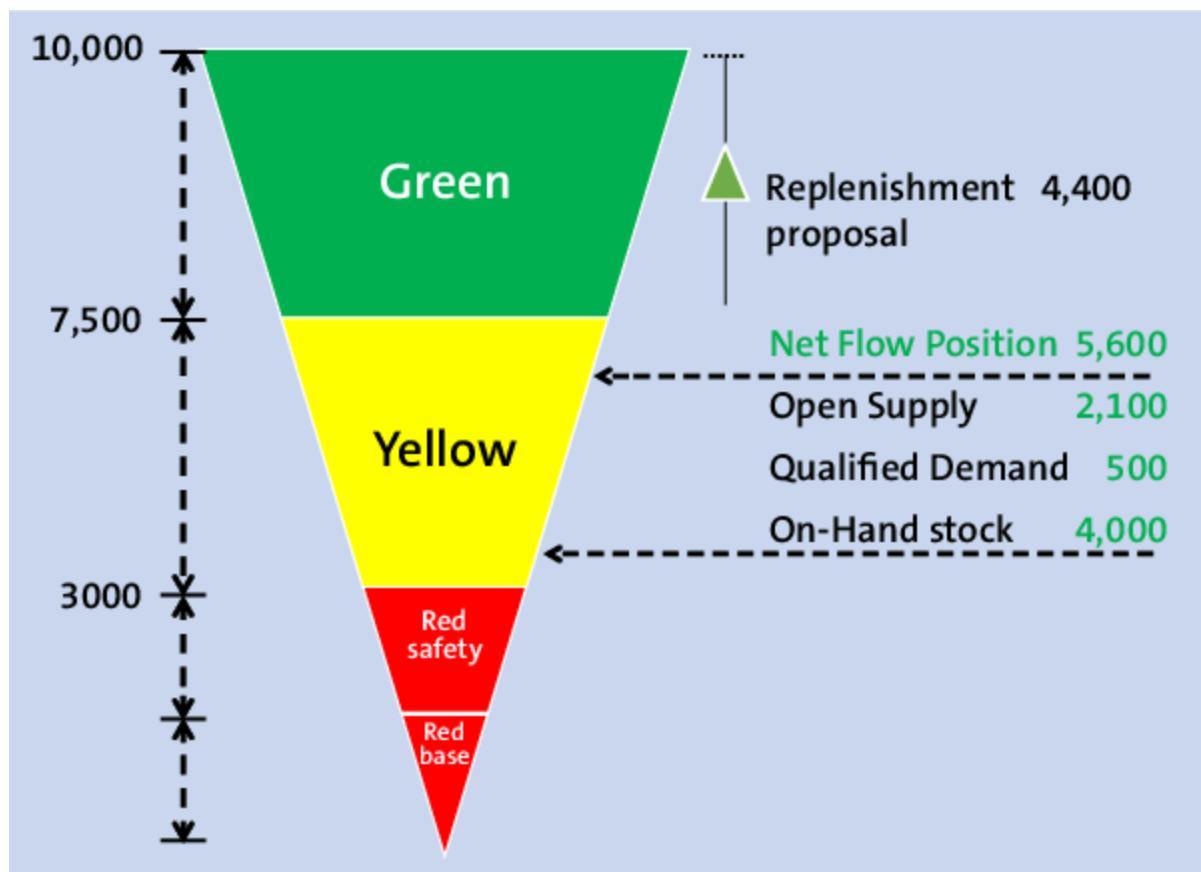


Figure 9.85 Net Flow Position

| | | | | | | |
|--|---|--|----------------------------|--|--|--------------------|
| Schedule Product Classification (DD)  ① | Mass Maintenance of Products (DD)  ② | Schedule Lead Time Classification of Products (DD)  ③ | Buffer Profile Maintenance | Schedule Buffer Proposal Calculation  ④ | Manage Buffer Levels Buffers ⑤ 4 | Buffer Positioning |
| Replenishment Planning By Planning Priority Buffers ⑥ 0 | Replenishment Execution By On-Hand Status Buffers ⑦ 7 | Planner Overview  | | | | |

Figure 9.86 SAP Fiori Apps for DDR in SAP S/4HANA

Parameters

Thresholds for Value (ABC) Classification

Usage Value in %:

A (High):

B (Medium):

C (Low):

Thresholds for BOM Usage (PQR) Classification

BOM Usage:

P (High):

Q (Medium):

R (Low):

Thresholds for Variability (XYZ) Classification

Coefficient of Variation:

X (Low):

Y (Medium):

Z (High):

Job Parameters

Maintain Logs:

Parallel Processing:

Schedule **Check** **Template** **Cancel**

The screenshot shows a software interface for scheduling product classification. It's divided into several sections: 'Parameters' at the top, followed by three classification sections ('ABC', 'PQR', 'XYZ') each with input fields for thresholds. Below these are 'Job Parameters' with checkboxes for 'Maintain Logs' and 'Parallel Processing'. At the bottom is a dark footer bar with four buttons: 'Schedule' (highlighted in blue), 'Check', 'Template', and 'Cancel'.

Figure 9.87 Schedule Product Classification (DD) App

SAP Mass Maintenance of Products (DD) ▾

Standard * ▾

| Product: | Product Group: | Plant: | MRP Area: | Procurement Type: |
|--|---|---|--|--|
| Search <input type="text" value="TS422"/> <input type="button" value="🔍"/> | <input type="text" value="TS422"/> <input type="button" value="✖"/> | <input type="button" value="Plant 1 US (1710)"/> <input type="button" value="✖"/> | <input type="button" value=""/> <input type="button" value="✖"/> | <input type="button" value=""/> <input type="button" value="✖"/> |
| Variability Indicator: | DLT Indicator: | Value Indicator: | BOM Usage Indicator: | MRP Type: |
| <input type="button" value=""/> <input type="button" value="▼"/> | <input type="button" value=""/> <input type="button" value="▼"/> | <input type="button" value=""/> <input type="button" value="▼"/> | <input type="button" value=""/> <input type="button" value="▼"/> | <input type="text" value="PD"/> <input type="button" value="✖"/> |
| <input type="button" value="Adapt Filters (3)"/> <input type="button" value="Go"/> | | | | |
| <input type="button" value="^"/> <input type="button" value="⤓"/> | | | | |

Products (8)

| Product | Plant | MRP Area | Variability Indicator | DLT Indicator | Value Indicator | BOM Usage Indicator | MRP Type |
|--------------|-------|----------|-----------------------|----------------|-----------------|---------------------|----------|
| TS422_FG100 | 1710 | 1710 | X (Low) | (Unclassified) | C (Low) | R (Low) | PD |
| TS422_FG101 | 1710 | 1710 | X (Low) | G (Long) | C (Low) | R (Low) | PD |
| TS422_FG103 | 1710 | 1710 | X (Low) | (Unclassified) | C (Low) | R (Low) | PD |
| TS422_FG106 | 1710 | 1710 | X (Low) | (Unclassified) | C (Low) | R (Low) | PD |
| TS422_SFG100 | 1710 | 1710 | X (Low) | (Unclassified) | C (Low) | R (Low) | PD |
| TS422_SFG101 | 1710 | 1710 | X (Low) | (Unclassified) | C (Low) | O (Medium) | PD |
| TS422_SFG102 | 1710 | 1710 | X (Low) | (Unclassified) | C (Low) | P (High) | PD |
| TS422_SFG103 | 1710 | 1710 | X (Low) | (Unclassified) | C (Low) | P (High) | PD |

Figure 9.88 Mass Maintenance of Products (DD) App

SAP Mass Maintenance of Products (DD)

Standard * ▾

| Product | Plant | MRP Area |
|---|-------|----------|
| <input type="checkbox"/> TS422_FG100 | 1710 | 1710 |
| <input checked="" type="checkbox"/> TS422_FG101 | 1710 | 1710 |
| <input type="checkbox"/> TS422_FG103 | 1710 | 1710 |
| <input type="checkbox"/> TS422_FG106 | 1710 | 1710 |
| <input type="checkbox"/> TS422_SFG100 | 1710 | 1710 |
| <input type="checkbox"/> TS422_SFG101 | 1710 | 1710 |
| <input type="checkbox"/> TS422_SFG102 | 1710 | 1710 |
| <input type="checkbox"/> TS422_SFG103 | 1710 | 1710 |

Change

Product

MRP Type: < Replace Field Value > D1

MRP Controller: < Keep Existing Value >

Lot Sizing Procedure: < Keep Existing Value >

Maximum Stock Level: < Keep Existing Value >

Reorder Point: < Keep Existing Value >

Safety stock: < Keep Existing Value >

Minimum Lot Size: < Keep Existing Value >

BOM Usage: R (Low), R (Low), R (Low), R (Low), Q (Medium), P (High), P (High)

Apply Changes Cancel Restore

Figure 9.89 Maintain/Update the MRP Type, Lot Size and More in the App

Purchase order text MRP 1 MRP 2 MRP 3 MRP 4 Advanced Planning Exte...

| | | | |
|----------------------|--------------------------|---|---------------------------------|
| Material | TS422_FG101 | <input type="button" value="i"/> | <input type="button" value=""/> |
| Descr. | TS422_FG101 | | |
| Plant | 1710 Plant 1 US | | |
| General Data | | | |
| Base Unit of Measure | PC | Piece | MRP Group |
| Purchasing Group | | | ABC Indicator |
| Plant-Sp.Matl Status | | | Valid From |
| MRP procedure | | | |
| MRP Type | D1 | Demand-Driven Replenishment - firming type... | |
| Reorder Point | 30 | Planning time fence | |
| Planning cycle | | MRP Controller | 001 |
| Lot size data | | | |
| Lot Sizing Procedure | H1 | Lot-for-lot order quantity | |
| Minimum Lot Size | | Maximum Lot Size | |
| Fixed lot size | | Maximum Stock Level | 50 |
| LS-Independent Costs | | Storage Costs Code | |
| Assembly scrap (%) | | Takt time | |
| Rounding Profile | | Rounding value | |
| MRP areas | | | |
| MRP area exists | <input type="checkbox"/> | MRP areas | |

Figure 9.90 MRP 1 View with MRP Type and Lot Size Change to DDR Relevant

SAP New Job: Decoupled Lead Time (EFG) Classification of Products (DD) ▾

Decoupled Lead Time (EFG) Classification of Products

1 Template Selection ————— 2 Scheduling Options ————— 3 Parameters

Number of Days (Past):* 10

Parameters

| DLT Thresholds for Make (in Days) | | DLT Thresholds for Buy (in Days) | |
|-----------------------------------|-----|----------------------------------|-----|
| E (Short): | 001 | E (Short): | 001 |
| F (Medium): | 003 | F (Medium): | 003 |
| G (Long): | > | G (Long): | > |

| DLT Thresholds for Transfer (in Days) | | Job Parameters | |
|---------------------------------------|-----|----------------------|-------------------------------------|
| E (Short): | 001 | Parallel Processing: | <input type="checkbox"/> |
| F (Medium): | 003 | Maintain Logs: | <input checked="" type="checkbox"/> |
| G (Long): | > | | |

Figure 9.91 Schedule Lead Time Classification for Products (DD) App

SAP New Job: Buffer Proposal Calculation for Demand-Driven Replenishment ▾

Buffer Proposal Calculation for Demand-Driven Replenishment

1 Template Selection 2 Scheduling Options 3 Parameters

Selection Criteria and Parameters

Product Selection Criteria

| | |
|-----------------|----------|
| Product: | TS422* ⓘ |
| Product Group: | |
| Plant:* | 1710 |
| MRP Area: | |
| MRP Controller: | |

Automated Proposal Processing Options

| | |
|-------------------------|----------------------------------|
| Adopt with Tolerance: | <input checked="" type="radio"/> |
| Allow decrease up to %: | |
| Allow increase up to %: | |
| Always Adopt Proposals: | <input type="radio"/> |
| Do Not Adopt Proposals: | <input type="radio"/> |

Average Daily Usage

| | |
|----------------------------|----------------------------------|
| Based on Fixed Interval: | <input checked="" type="radio"/> |
| Based on Rolling Interval: | <input type="radio"/> |

Decoupled Lead Time

| | |
|-------------------------------|----------------------------------|
| Reuse from DD Product Master: | <input checked="" type="radio"/> |
| Recalculate: | <input type="radio"/> |

Job Parameters

| | |
|----------------------|-------------------------------------|
| Parallel Processing: | <input type="checkbox"/> |
| Maintain Logs: | <input checked="" type="checkbox"/> |

Schedule **Check** **Template**

The screenshot shows the SAP Buffer Proposal Calculation app interface. At the top, there's a header with the SAP logo and the title 'New Job: Buffer Proposal Calculation for Demand-Driven Replenishment'. Below the header, there are three tabs: 'Template Selection' (1), 'Scheduling Options' (2), and 'Parameters' (3). The 'Parameters' tab is currently selected. The main area is divided into several sections: 'Product Selection Criteria' (with fields for Product, Product Group, Plant, MRP Area, and MRP Controller), 'Automated Proposal Processing Options' (with radio buttons for 'Adopt with Tolerance' and other tolerance settings), 'Average Daily Usage' (with radio buttons for 'Based on Fixed Interval' and 'Based on Rolling Interval'), 'Decoupled Lead Time' (with radio buttons for 'Reuse from DD Product Master' and 'Recalculate'), and 'Job Parameters' (with checkboxes for 'Parallel Processing' and 'Maintain Logs'). At the bottom right, there are buttons for 'Schedule', 'Check', and 'Template'.

Figure 9.92 Schedule Buffer Proposal Calculation App

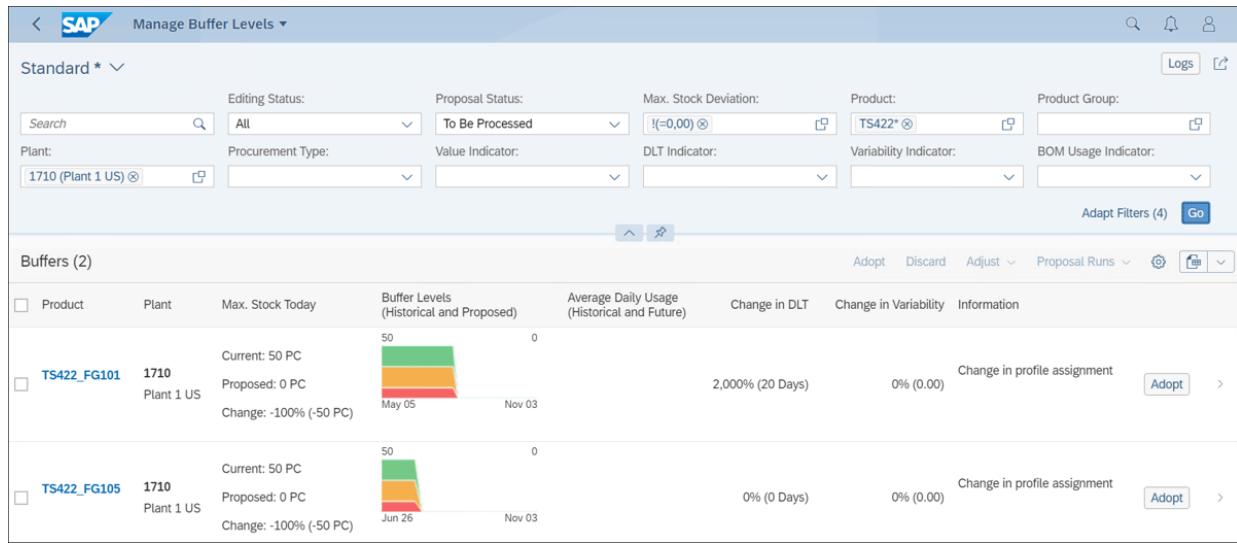


Figure 9.93 Manage Buffer Levels App

The screenshot shows the SAP Demand-Driven Replenishment application. At the top, there is a search bar labeled "Search" and a "Logs" button. Below the search bar are several filter fields: "Planning Priority Status", "Planning Action Status", "Procurement Type" (set to "Make"), "Variability Indicator", and "Lead Time Indicator". There are also dropdowns for "Value Indicator" and "BOM Usage Indicator". A "Create Supply" button with a gear icon is located on the right. The main area displays a table titled "Buffers (3)". The columns are: Product, Product Description, Planning Priority, Net Flow Position, Proposed Quantity, Planning Action, Decoupled Lead Time, Execution Action, On-Hand Buffer Status, Plant, and On-Hand Stock. Two rows are visible:

| <input type="checkbox"/> Product | Product Description | Planning Priority | Net Flow Position | Proposed Quantity | Planning Action | Decoupled Lead Time | Execution Action | On-Hand Buffer Status | Plant | On-Hand Stock |
|--------------------------------------|---------------------------------|-------------------|-------------------|-------------------|-----------------|---------------------|---|-----------------------|-------|---------------|
| <input type="checkbox"/> TS422_FG101 | Planning Material | 60.00% | 30 PC | | | 21.00 | Expedited On 07.02.2021, 14:57:07 | 0.00% | 1710 | 0 PC |
| Open Supply: 30 PC | | | | | | | | | | |
| <input type="checkbox"/> TS422_FG105 | Finished Product TS422_FG105 | 60.00% | 30 PC | | | 1.00 | Expedite Supply | 0.00% | 1710 | 0 PC |
| Open Supply: 30 PC | | | | | | | | | | |

Figure 9.94 Replenishment Proposal Based Net Flow Calculation in the MRP Run

The screenshot shows the SAP Demand-Driven Replenishment application. At the top, there is a search bar and filter buttons for On-Hand Stock Status (Search), Procurement Type (Make), Variability Indicator, Lead Time Indicator, and Value Indicator. Below these are filters for BOM Usage Indicator (Product: TS422*) and Product (TS422*). There are also 'Adapt Filters (2)' and 'Go' buttons. The main area displays 'Buffers (2)' with a table:

| Product | Product Description | On-Hand Buffer Status | On-Hand Stock | Open Supply | Execution Action |
|-------------|------------------------------|-----------------------|---------------|-------------|--------------------------------------|
| TS422_FG101 | Planning Material | 0.00% | 0 PC | 30 PC | Expedited On 07.02.2021, 14:57:07 |
| TS422_FG105 | Finished Product TS422_FG105 | 0.00% | 0 PC | 30 PC | Expedite Supply |

Figure 9.95 Replenishment Execution by On-Hand Status App

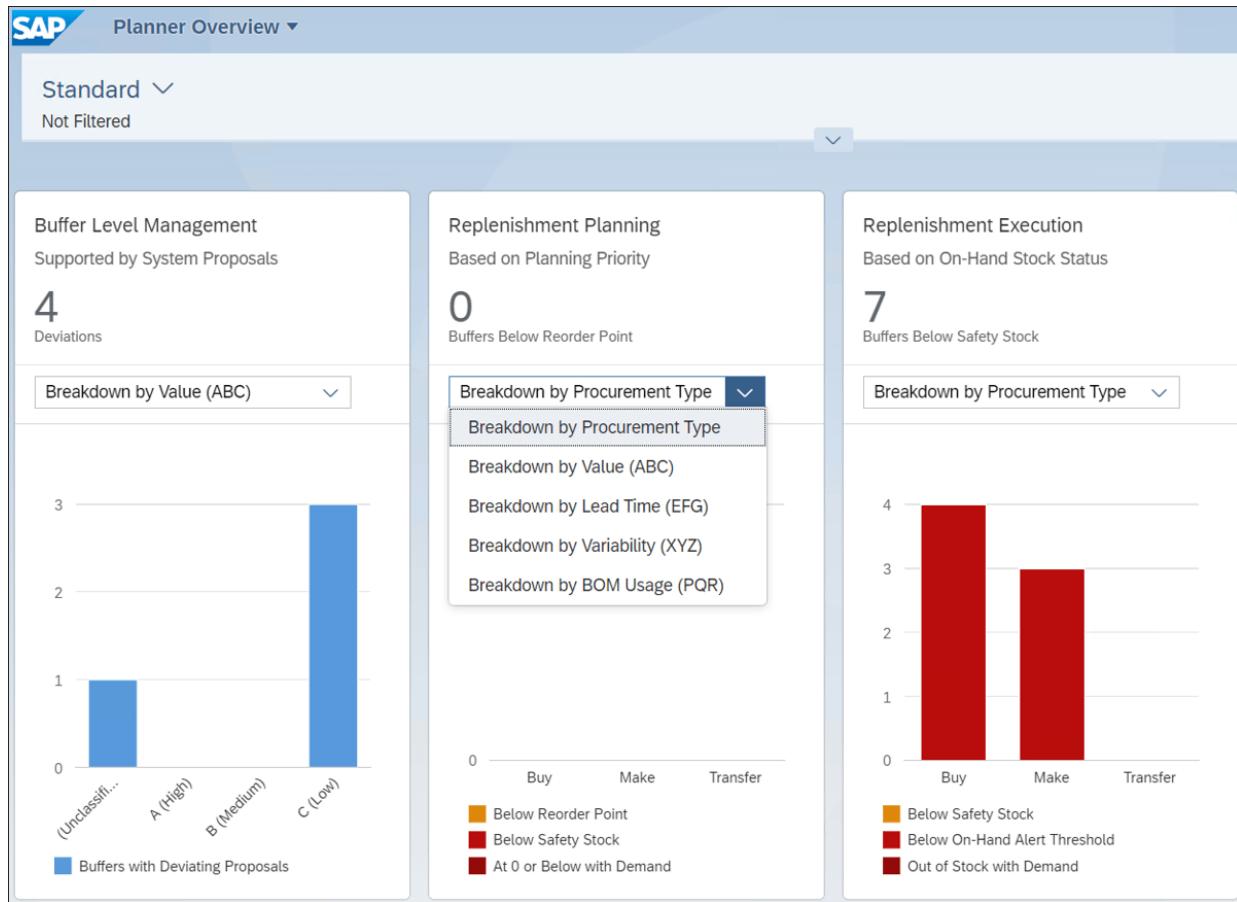


Figure 9.96 Planner Overview App

