

SCM601

Processes in Logistics Execution

SAP ERP - Procurement and Logistics Execution

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Participant Handbook

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About This Handbook

This handbook is intended to complement the instructor-led presentation of this course, and serve as a source of reference. It is not suitable for self-study.

Typographic Conventions

American English is the standard used in this handbook. The following typographic conventions are also used.

Type Style	Description
<i>Example text</i>	Words or characters that appear on the screen. These include field names, screen titles, pushbuttons as well as menu names, paths, and options. Also used for cross-references to other documentation both internal and external.
Example text	Emphasized words or phrases in body text, titles of graphics, and tables
EXAMPLE TEXT	Names of elements in the system. These include report names, program names, transaction codes, table names, and individual key words of a programming language, when surrounded by body text, for example SELECT and INCLUDE.
Example text	Screen output. This includes file and directory names and their paths, messages, names of variables and parameters, and passages of the source text of a program.
Example text	Exact user entry. These are words and characters that you enter in the system exactly as they appear in the documentation.
<Example text>	Variable user entry. Pointed brackets indicate that you replace these words and characters with appropriate entries.

Icons in Body Text

The following icons are used in this handbook.

Icon	Meaning
	For more information, tips, or background
	Note or further explanation of previous point
	Exception or caution
	Procedures
	Indicates that the item is displayed in the instructor's presentation.

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Course Overview

This course gives an overview of Logistics Execution, the package found in the SAP Enterprise Resource Planning (SAP ERP) and SAP Supply Chain Management (SAP SCM) solutions that contains functions for mapping and controlling the execution of logistics processes. The main focus is placed on the various means of processing goods receipts and goods issues. The organizational prerequisites are also discussed in detail.

Target Audience

This course is intended for the following audiences:

- Project team managers
- Project team members

Course Prerequisites

Required Knowledge

- Technical: SAP01 (SAP Overview) or comparable
- Topical: Basic knowledge of logistics processes



Course Goals

This course will prepare you to:

- Understand how to control the basic processes of logistics execution: goods receipts and goods issues



Course Objectives

After completing this course, you will be able to:

- Explain the organizational structures used in Logistics Execution
- Create and maintain all relevant master data
- Create the most important documents
- Map goods receipt and goods issue processes in the SAP system
- Monitor these processes in the warehouse activity monitor

Unit 1

Logistics Execution in mySAP Business Suite

Unit Overview

This unit explains how Logistics Execution is integrated into mySAP Business Suite. First, you will learn about the role that mySAP SCM and mySAP ERP plays in mySAP Business Suite. Then we will position Logistics Execution, the actual topic of this course, within mySAP SCM and mySAP ERP.



Unit Objectives

After completing this unit, you will be able to:

- Describe SAP Business Suite
- Classify the SAP SCM and SAP ERP solutions within SAP Business Suite
- Name the components of SAP SCM and SAP ERP
- Name the components of Logistics Execution
- Describe how Logistics Execution functions within SAP ECC

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Lesson: Positioning Within SAP Solutions

Lesson Overview

Logistics Execution is an application component of the solutions **SAP Supply Chain Management (SAP SCM)** and **SAP Enterprise Resource Planning (SAP ERP)**. Both are, in turn, part of **SAP Business Suite**. This lesson demonstrates the relationship between the whole (SAP Business Suite) and its parts (the solutions). It also aims to clarify the position of Logistics Execution within the SAP SCM and SAP ERP solutions.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe SAP Business Suite
- Classify the SAP SCM and SAP ERP solutions within SAP Business Suite
- Name the components of SAP SCM and SAP ERP

Business Example

IDES AG wants to use SAP ERP to optimize its logistics processes. In particular, the company wants to examine how this solution might be able to support logistics execution functions.

SAP Business Suite: Definition and Basic Structure

The product name **SAP Business Suite** describes a group of solutions covering a broad spectrum of business requirements. Elements from this group can be combined as required, with each other or with external products, in order to map complex business scenarios. SAP Business Suite is a solution package that can be used in all industries. Its technical architecture is based on open standards, so that different types of SAP and external systems can be connected to each other. The components of SAP Business Suite are shown in the figure below:

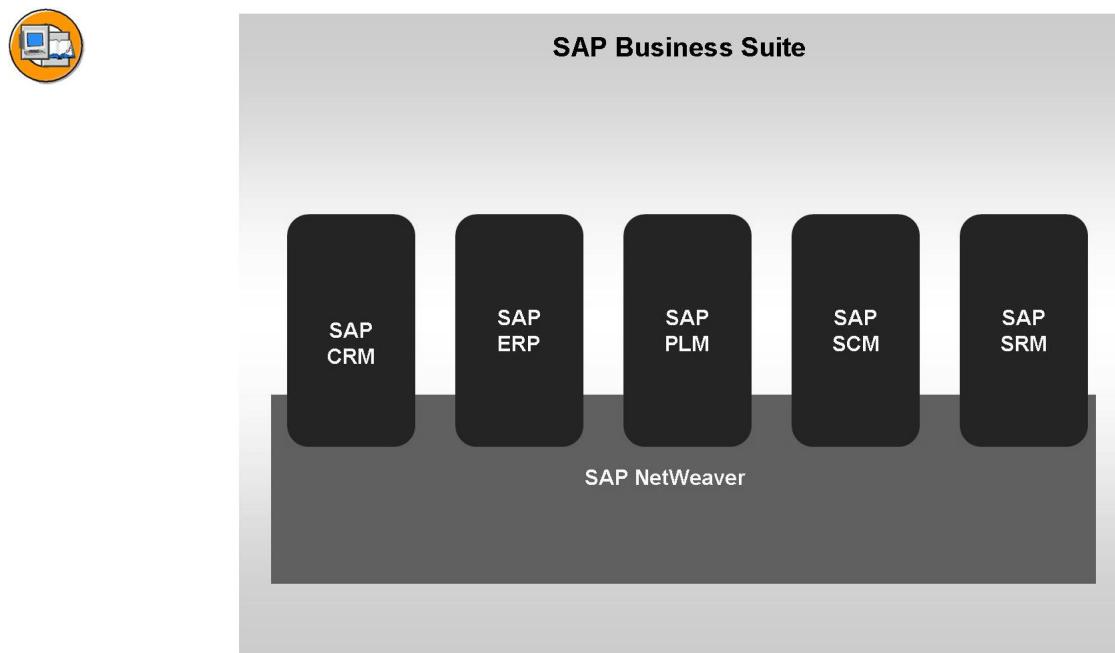


Figure 1: Components of SAP Business Suite

SAP Business Suite contains a group of non-industry specific solutions that offer functions for specific business activities. They support process control in a framework that extends beyond your own company (and therefore also beyond your own system landscape).

→ **Note:** Since many industries have specific requirements for the technical way in which systems map and control processes, SAP also offers **industry solutions**. These deal with systems that contain additional - industry-specific - functions, and that do not contain unnecessary functions. Solutions specifically intended for small and midsize businesses are also available.

The five key solutions in the overview are used for planning, controlling, and optimizing specific business activities in a global context. They each group together a specific selection of company employees and partners. In this way, for example, the SAP CRM is used for maintaining and enhancing customer relationships. This means that office-based sales employees, field sales representatives, service providers (such as call centers), and customers are integrated in a type of network.

SAP NetWeaver forms the technical “foundations” of mySAP Business Suite, as an application and integration platform. It enables you to network complex, heterogeneous system landscapes across technology boundaries.

The SAP SCM Solution

SAP SCM includes tools for planning, execution, and monitoring of complex procurement and distribution processes. You can compare planned and actual values in order to optimize processes. You can also evaluate the reliability of service providers. With the SAP NetWeaver Portal, a component of SAP NetWeaver, companies around the world can collaborate across the Internet.

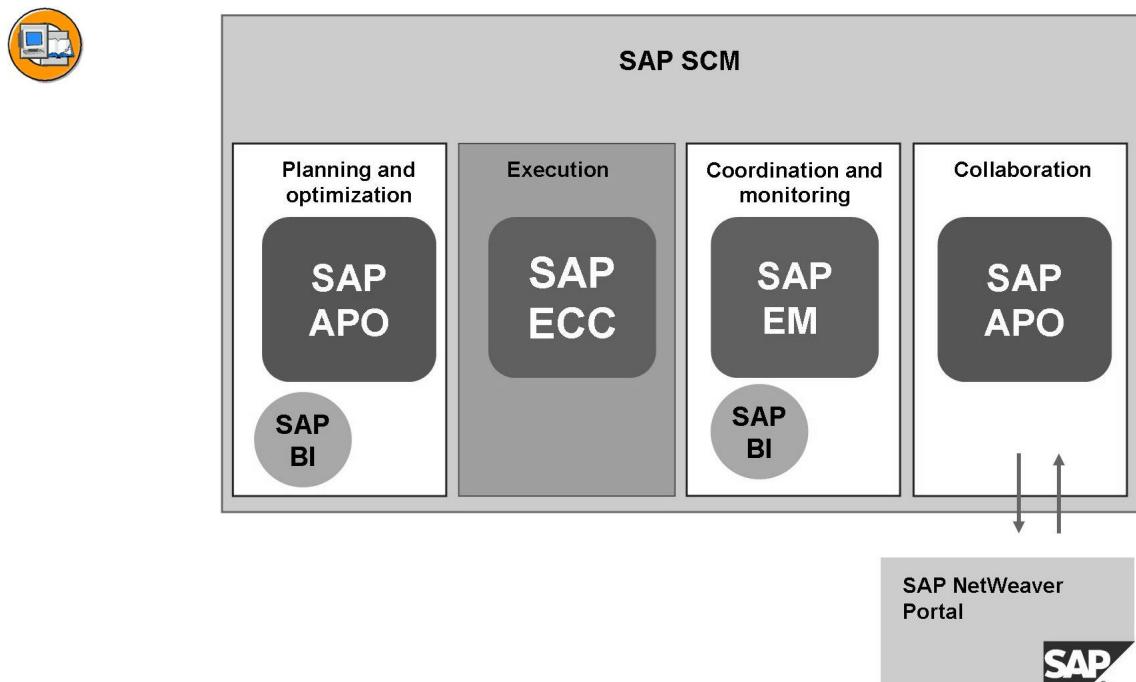


Figure 2: The SAP SCM Solution

Planning, execution, and monitoring of individual process steps take place in different systems, which are connected to each other. The SAP Advanced Planning and Optimization (SAP APO) component supports all planning activities that occur within supply chain management:

- Requirements planning
- Demand planning
- Production planning
- Transportation planning

These planning activities can interactively include third-parties (suppliers, service providers, customers)

The execution of the processes is mapped in the **SAP ERP Central Component (SAP ECC)** system. This means, for example, that production plans from SAP APO are converted to production orders, or planned shipments are scheduled and completed. SAP ECC provides master data (for example, material or vendor

masters) to SAP APO. Planning data from SAP APO is used in SAP ECC as the basis for creating documents (purchase orders, production orders, and shipments). Documents created in SAP ECC are then, in turn, used as the basis for planning in SAP APO (for example, sales orders for demand planning).

→ **Note:** SAP ECC is the technical successor of SAP R/3.

To coordinate and monitor logistical processes, you can use SAP Event Management (SAP EM). This component processes messages that refer to the progress of logistics processes, updates the status of these processes, and triggers any necessary follow-on activities.

To optimize the process flows, you can use the SAP NetWeaver component SAP NetWeaver Business Intelligence (SAP BI). In this way, the data of the actual process flow from other SAP systems can be used as a basis for realistic planning in SAP APO.

The SAP ERP Solution

SAP ERP is also part of SAP Business Suite. It comprises SAP ERP Financials, SAP ERP Human Capital Management, SAP ERP Operations, and SAP ERP Corporate Services. Like the other solutions, it is based on the integration and application platform, SAP NetWeaver.

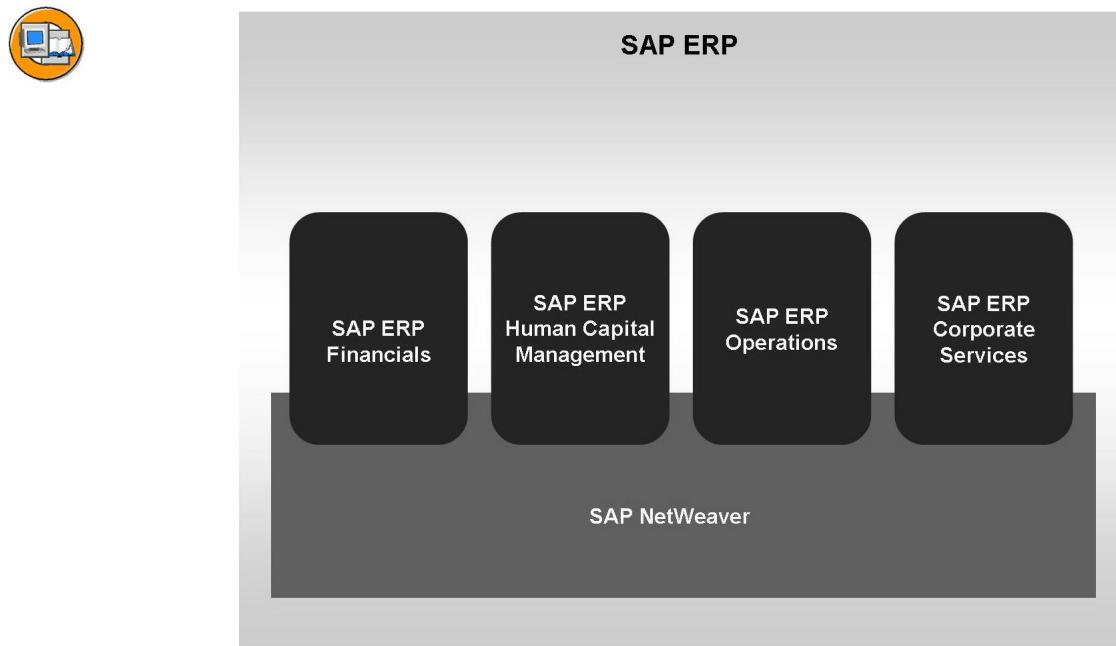


Figure 3: The SAP ERP Solution

SAP ERP provides functions for analyses, financial accounting, human resources management, operational processing, and central enterprise services. In addition, it supports system administration for user management, configuration management, central database administration, and company-wide use of Web services. The main system element is **SAP ECC**.

The SAP ERP Operations solution for controlling logistics and production groups the functions of logistics execution under “Procurement and Logistics”.

Logistics Execution as Part of SAP ECC

Logistics Execution is an application component of SAP ECC. The SAP ECC system itself consists of various subcomponents. The three most important areas in the context of this course - Logistics, Accounting, and Human Resources - have been emphasized in the diagram below:

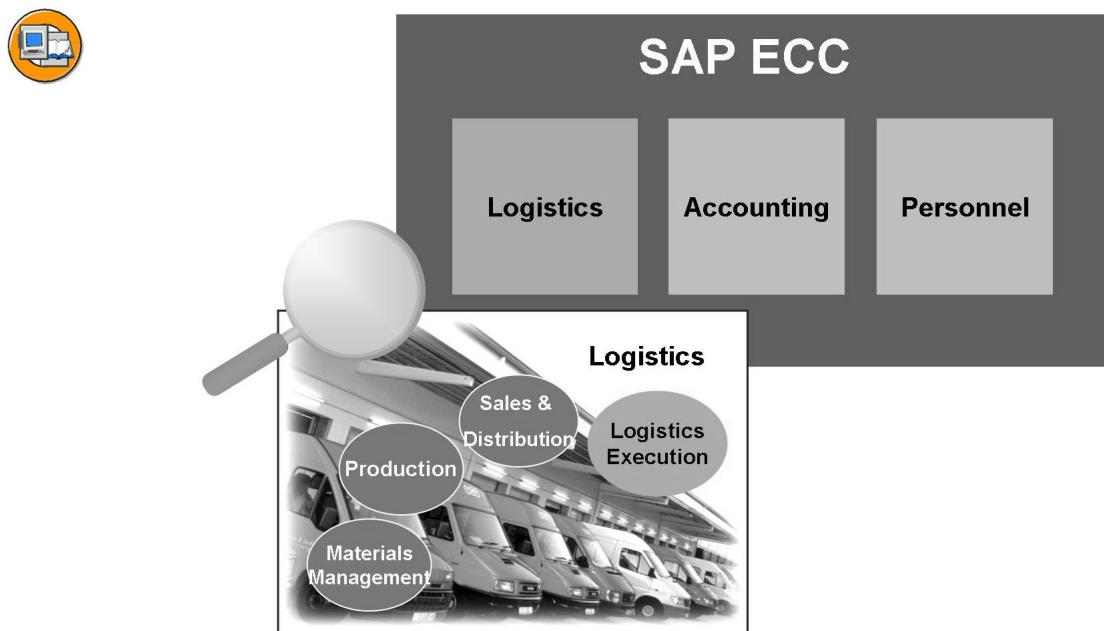


Figure 4: Logistics Execution as Part of SAP ECC

The components with direct influence on processes - Materials Management, Sales and Distribution, Logistics Execution, and Production, were assigned to the **Logistics** area. However, there are also application components that run alongside the processes, such as Plant Maintenance and Quality Management. There are also cross-process functions such as Batch Management and Document Management, but also Handling Unit Management.

- **Note:** These tools are integrated into the menu for Logistics under *Central Functions*, which is appropriate with regards to their cross-process nature.

The principal advantage of SAP ECC is the extensive **integration** of its components in the entire system. The individual business applications are not placed next to each other without any connections, but instead access the same master data and exchange transaction data throughout the process. This integration becomes particularly noticeable when you work with the component **Logistics Execution**. Logistics execution is “kept alive” by the data flow from other components: ordered goods or goods produced in-house are delivered and putaway. Sales and Distribution enters a sales order. This order is then delivered by picking goods from the warehouse, packing them, loading them, and finally transporting them to the recipient.

Exercise 1: Introduction to the SAP Business Suite

Exercise Objectives

After completing this exercise, you will be able to:

- Gain an overview of SAP Business Suite

Business Example

You want to obtain some information about SAP Business Suite from public sources.

Task:

Use the Internet to gain an overview of SAP Business Suite.

1. Go to the SAP Web site, www.sap.com, select a country site, and under *SAP Solutions*, search for more detailed information about the solutions that interest you.
2. Which additional means of procuring information does SAP make available to its customers and partners?

Solution 1: Introduction to the SAP Business Suite

Task:

Use the Internet to gain an overview of SAP Business Suite.

1. Go to the SAP Web site, www.sap.com, select a country site, and under *SAP Solutions*, search for more detailed information about the solutions that interest you.
 - a) Choose *Start → Training@sap* to start the Internet Explorer. To go to the SAP home page, enter www.sap.com in the browser window.
 - b) Choose *Country Sites* in the upper right screen area. On the next screen, choose the country version you want to use.
 - c) Under *SAP Solutions*, you will find an overview of SAP Business Suite, among other things, which contains links to information about individual solutions.
2. Which additional means of procuring information does SAP make available to its customers and partners?

Answer: SAP customers and partners can also use the **SAP Service Marketplace**. For more information, see service.sap.com. Access is possible with a user ID (S-user).



Lesson Summary

You should now be able to:

- Describe SAP Business Suite
- Classify the SAP SCM and SAP ERP solutions within SAP Business Suite
- Name the components of SAP SCM and SAP ERP

Lesson: Logistics Execution

Lesson Overview

Within SAP SCM and SAP ERP, Logistics Execution offers you a package for all logistics execution functions, such as Warehouse Management, Shipping Processing, and Transportation Processing. This lesson gives you an overview of the components and uses of Logistics Execution.



Lesson Objectives

After completing this lesson, you will be able to:

- Name the components of Logistics Execution
- Describe how Logistics Execution functions within SAP ECC

Business Example

IDES AG wants to use SAP ERP to optimize its logistics processes. In particular, the company wants to examine how this solution might be able to support logistics execution functions.

Integration in SAP SCM and SAP ERP Solutions

SAP ECC uses its logistics functions to map the execution of procurement and distribution processes within SAP SCM and SAP ERP.

Logistics Execution is the SAP ECC application component for specific functions of executable logistics. It is connected to Production Planning and Control, Materials Management, and Sales and Distribution. It is possible, however, to use Logistics Execution outside the SAP ECC context as a separate system. This is why some publications refer to a “Logistics Execution System”. The main motive for using Logistics Execution in isolation is for reasons of security. If the system in which commercial processes are controlled fails at any time, executable logistics is still functional in its own, separate system. In this case, the separate Logistics Execution system does not necessarily have to be connected to a central SAP system.

Components and Sources

Logistics Execution was introduced in the SAP R/3 4.5A system landscape to group together and develop existing subfunctions of logistics execution.

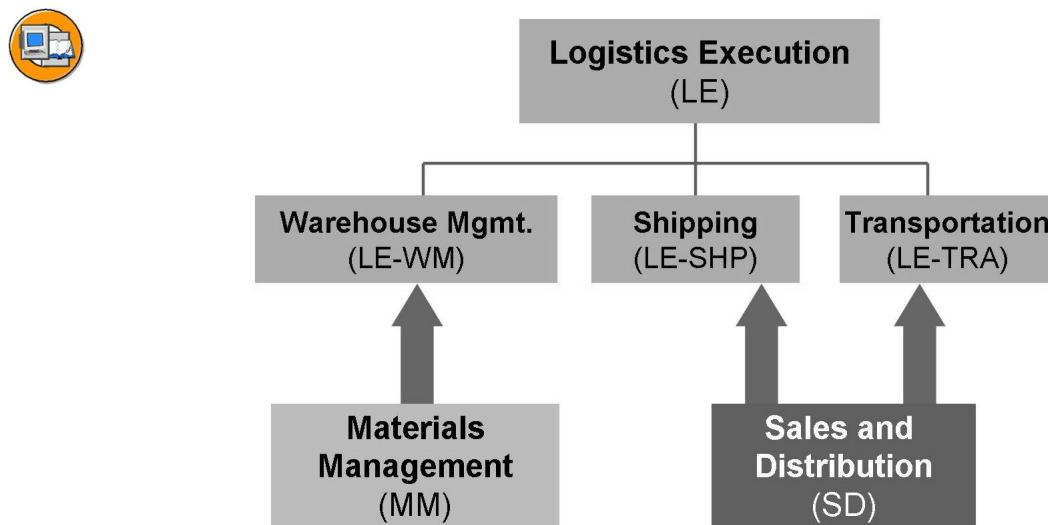


Figure 5: Logistics Execution Components and Sources

Warehouse Management was adopted from Materials Management together with **Shipping** and **Transportation Processing** from Sales and Distribution. In other words, functions already existed in SAP R/3 before the introduction of Logistics Execution, but were assigned to other application components. These changes had an effect on both the user menu and the structure of Customizing. Several transactions are now only available in the new *Logistics Execution* area menu created for SAP R/3 4.5, and a new submenu now exists in Customizing for configuring Logistics Execution processes in the system.

→ **Note:** Customizing for Warehouse Management was completely removed from Customizing for Materials Management. Parts of the Customizing menu for Shipping and Transportation are available under both *Sales and Distribution* and *Logistics Execution*.

Functions

Logistics Execution offers you all the functions necessary for mapping the execution of logistics processes, with no industry-specific bias. The core functions of Logistics Execution nearly always focus on complex **goods receipt** and **goods issue** processes.

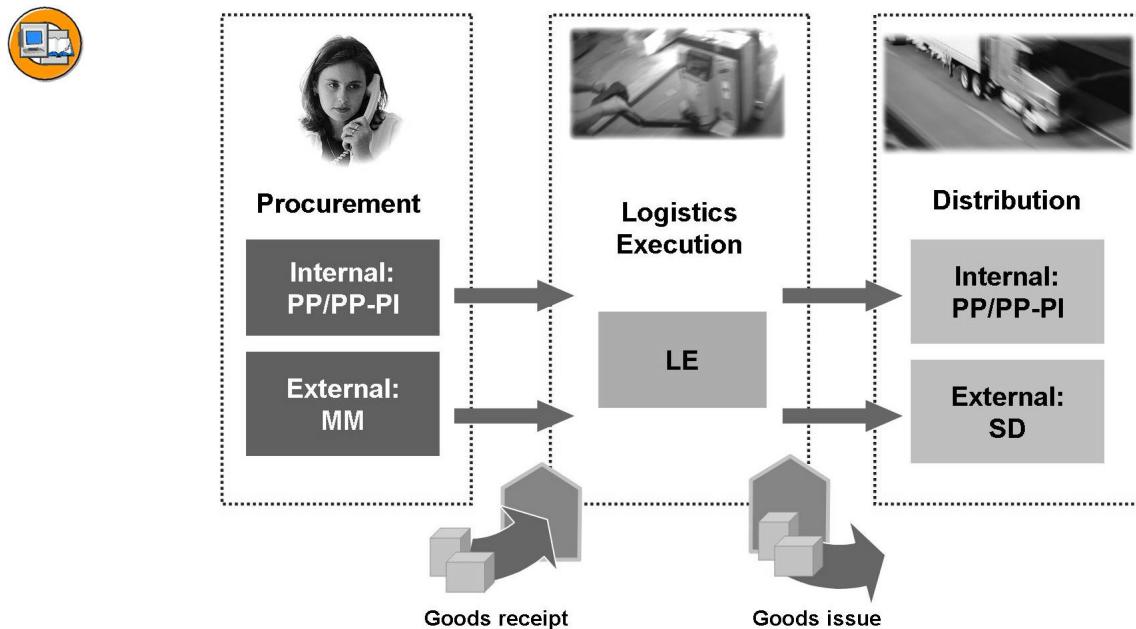


Figure 6: Function in SAP ECC

In SAP ECC, Logistics Execution is the link between procurement and distribution, regardless of whether processes are internal or involve third parties (vendors, customers, or service providers). Materials produced in-house, and goods procured externally, are put away and removed from storage using Warehouse Management, either to supply your own production, or to deliver goods to industry or consumers. The underlying organizational structures involved can be extremely complex; Logistics Execution uses its own organizational units and master data that are integrated in the system of organizational structures in SAP ECC. You can use these structure elements to map various business situations.

→ **Note:** To fulfill special requirements in certain areas, there are preconfigured interfaces to external systems. This means, for example, you can connect a warehouse control unit for an automatic high rack storage area, or an external transportation planning system, to SAP ECC.

Basic Forms of Mapping Processes

Logistics Execution offers you two basic means of mapping processes for goods receipts and goods issues: You can either make **delivery creation** or an **inventory management posting** (each with reference to a preceding document) the start of the process. The following overview contrasts the document flow and technical posting processes for both basic forms:

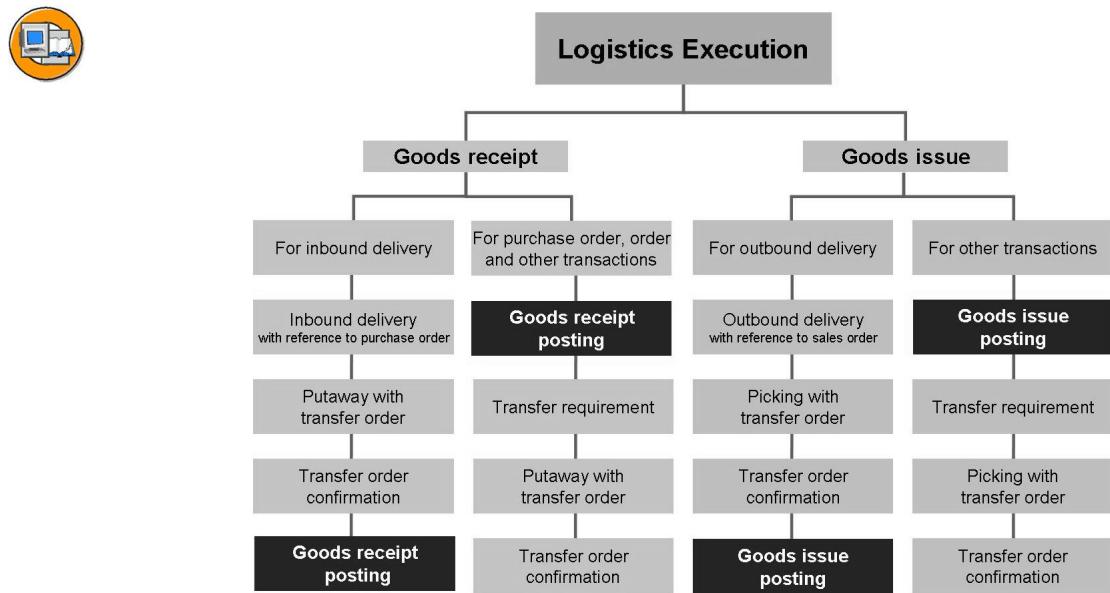


Figure 7: Process Overview

If you work with deliveries, the warehouse management activities (creating and confirming transfer orders) are completed **before** the inventory management posting. The posting always refers to the delivery.

→ **Note:** The transfer order is the document used to perform all material movements in the warehouse.

However, the inventory management posting can also be at the **beginning** of the process. It generates a transfer requirement, which is the basis for planning and posting the warehouse management activities. The putaway or stock removal using transfer orders completes the process.

→ **Note:** The graphics displaying the processes are related to the corresponding user menu.

In many cases, the reason for the putaway or stock removal defines the means of mapping the process. For example, in the standard system, for goods receipts from production you can only use goods receipt posting for the work order with a subsequent putaway; for sales order processing the stock removal usually refers to the outbound delivery.

Exercise 2: Logistics Execution

Exercise Objectives

After completing this exercise, you will be able to:

- Orient yourself in the area menu for Logistics Execution

Business Example

IDES AG wants to use SAP ECC to optimize its logistics processes. In particular, the company wants to examine how this solution might be able to support executable logistics functions.

Task:

Log on to the SAP system and take a look at the area menu for the Logistics Execution component.

1. Log on to the training system with your user name **SCM601-##**. The instructor will tell you the name of the system and the key for the training client.
2. On the initial screen, you can see the entire standard SAP ECC menu. Go to the area menu for Logistics Execution.
3. Open the subsections for the inbound and outbound processes. In the outbound process menu, go to the level for outbound deliveries. Which activities can you perform here?

Solution 2: Logistics Execution

Task:

Log on to the SAP system and take a look at the area menu for the Logistics Execution component.

1. Log on to the training system with your user name **SCM601-##**. The instructor will tell you the name of the system and the key for the training client.
 - a) In the lower screen toolbar, choose *Start* and then *Training*. From there you can log on directly to the relevant system. Choose *Logon*.
 - b) Enter the key for the relevant client, your user name **SCM601-##**, the initial password, and the key for the required logon language. Confirm these entries with *Enter*.
 - c) The first time you log on to the system, you are requested to enter a new password. You need to confirm the new password by entering it twice. Confirm your entries with *Enter*.
2. On the initial screen, you can see the entire standard SAP ECC menu. Go to the area menu for Logistics Execution.
 - a) Select *Logistics* → *Logistics Execution*.
3. Open the subsections for the inbound and outbound processes. In the outbound process menu, go to the level for outbound deliveries. Which activities can you perform here?
 - a) Choose *Logistics* → *Logistics Execution* → *Inbound Process* or *Outbound Process* → *Goods Issue for Outbound Delivery*.
 - b) Create Outbound Delivery, Picking, Packing, Loading, Shipment, Post Goods Issue, Billing



Lesson Summary

You should now be able to:

- Name the components of Logistics Execution
- Describe how Logistics Execution functions within SAP ECC



Unit Summary

You should now be able to:

- Describe SAP Business Suite
- Classify the SAP SCM and SAP ERP solutions within SAP Business Suite
- Name the components of SAP SCM and SAP ERP
- Name the components of Logistics Execution
- Describe how Logistics Execution functions within SAP ECC



Test Your Knowledge

1. SAP for Retail is a(n):

Choose the correct answer(s).

- A Cross-industry solution
- B Industry solution
- C Service
- D Solution for midsize businesses

2. SAP PLM is a(n):

Choose the correct answer(s).

- A Cross-industry solution
- B Industry solution
- C Service
- D Solution for midsize businesses

3. Which product does not belong to SAP SCM?

Choose the correct answer(s).

- A SAP APO
- B SAP ECC
- C SAP SEM
- D SAP EM

4. Logistics Execution is a part of

Choose the correct answer(s).

- A SAP ECC
- B SAP ERP
- C SAP APO
- D SAP SRM

5. Logistics Execution consists of which components?

6. Before SAP R/3 4.5, the Logistics Execution components were assigned to the following SAP application components:

Choose the correct answer(s).

- A Materials Management
- B Production Planning and Control
- C Sales and Distribution
- D Logistics - General

7. Which of the documents in the list are specific to Logistics Execution?

Choose the correct answer(s).

- A Sales order
- B Inbound delivery
- C Transfer requirement
- D Material document
- E Transfer order
- F Outbound delivery



Answers

1. SAP for Retail is a(n):

Answer: B

SAP for Retail is the **industry solution** for retail.

2. SAP PLM is a(n):

Answer: A

SAP PLM is a **cross-industry** solution.

3. Which product does not belong to SAP SCM?

Answer: C

SAP SEM (SAP Strategic Enterprise Management) is used in the SAP ERP Financials solution.

4. Logistics Execution is a part of

Answer: A, B

Logistics Execution is part of SAP ECC and therefore also part of the SAP ERP solution.

5. Logistics Execution consists of which components?

Answer: The components of Logistics Execution are Warehouse Management, Shipping, and Transportation Processing.

6. Before SAP R/3 4.5, the Logistics Execution components were assigned to the following SAP application components:

Answer: A, C

Before SAP R/3 4.5, Warehouse Management was assigned to Materials Management, and Shipping and Transportation processing were assigned to Sales and Distribution.

7. Which of the documents in the list are specific to Logistics Execution?

Answer: B, C, E, F

Deliveries, transfer requirements, and transfer orders are Logistics Execution documents.

Unit 2

Structure Elements

Unit Overview

To be able to map processes in the system using Logistics Execution, you must first fulfill some organizational prerequisites. In this unit, you will learn about these prerequisites and their priority in the process flow.



Unit Objectives

After completing this unit, you will be able to:

- Name the central organizational units in Logistics Execution and describe their basic functions
- Explain the organizational subdivision of warehouse numbers
- Position the organizational units specific to Logistics Execution within the overall system of logistics organizational units
- Explain the structure of a storage bin master record
- Define the term “quant”
- Create storage bins
- Check warehouse stocks at storage bin level
- Create the Warehouse Management views in a material master record
- In these views, differentiate between warehouse-number-specific and storage-bin-specific fields
- Maintain the fields in the Sales view of a customer record, which are relevant for the delivery process

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Lesson: Organizational Units

Lesson Overview

To be able to use the subfunctions of Logistics Execution (Warehouse Management, Delivery Processing, and Transportation Processing), you must create specific organizational units, and create relationships between these units and other organizational units.



Lesson Objectives

After completing this lesson, you will be able to:

- Name the central organizational units in Logistics Execution and describe their basic functions
- Explain the organizational subdivision of warehouse numbers
- Position the organizational units specific to Logistics Execution within the overall system of logistics organizational units

Business Example

To model goods receipt and goods issue processes in the company, you must first enter the relevant spatial and personnel factors, that is, storage spaces, shipping department(s), and internal transportation logistics, in SAP ECC.

Organizational Units in Logistics Execution

The subfunctions of the Logistics Execution System each use their own organizational units, which form the structural basis for process control. You define these organizational units in Customizing for the enterprise structure.

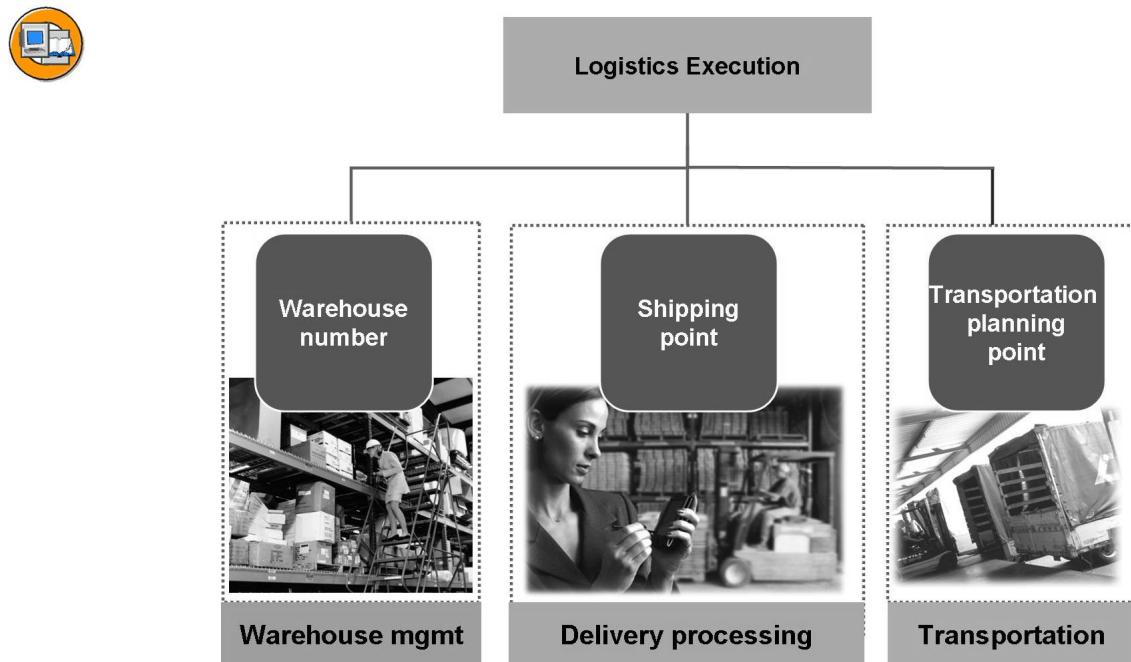


Figure 8: Organizational Units in Logistics Execution

The **warehouse number** is the superordinate organizational unit for the Warehouse Management system. It is used to map a warehouse complex. In practice, it often corresponds to a warehouse or warehouse building. Each warehouse number has a substructure whose elements are dealt with in the following section. The largest part of process control is fixed in this substructure.

In SAP ECC, the **shipping point** organizational unit is used to map the location of shipping processing or the group of people responsible for shipping processing. If necessary for process control, you can create more than one shipping point. Both spatial and technical process factors can be influential. For example, you can define a separate shipping point for each shipping type (air cargo, express delivery service, mail, and so on). The shipping point is essential for goods issue processes using outbound deliveries.

The **transportation planning point** is required if you want to use transportation processing in SAP ECC. Like the shipping point, the transportation planning point can also be either a location or a group of people. If required, you can define more than one transportation planning point. Here too, the shipping type can be used as a differentiation criteria.

Substructure of Warehouse Numbers

Each warehouse number includes a number of subordinate organizational units (the number is dependent on your Customizing settings), **storage types**, and **storage sections**, all of which are used to map the spatial relationships in the warehouse.

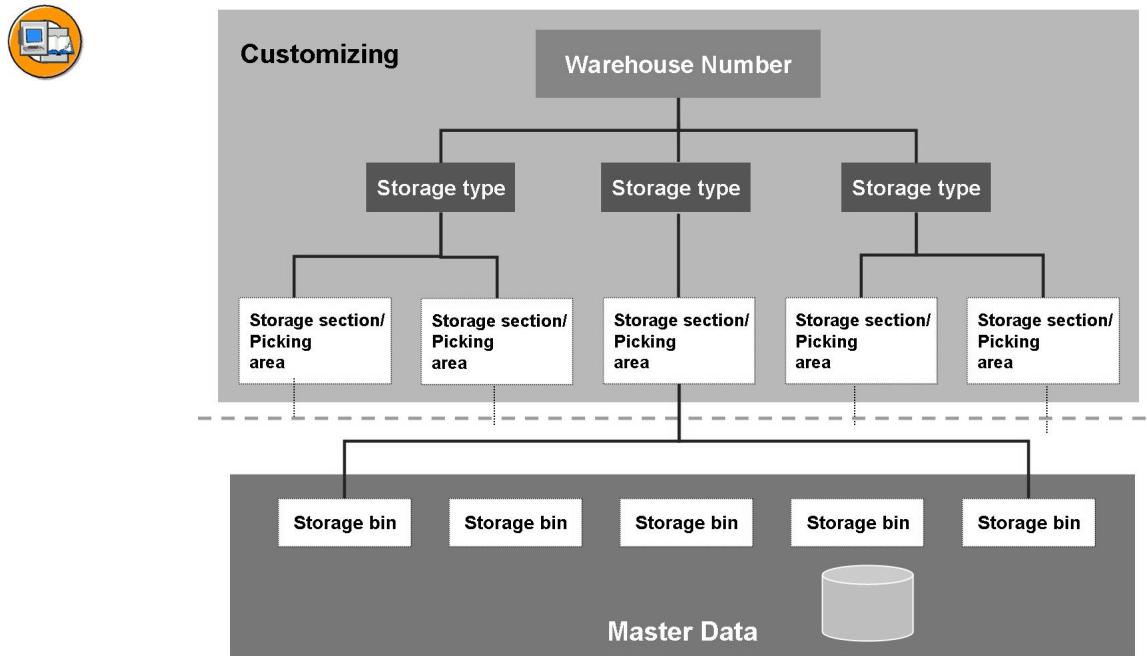


Figure 9: Substructure of Warehouse Numbers

The **storage type** organizational unit is used to map storage spaces that are separated either spatially or organizationally, or that should be handled separately in SAP ECC. The standard system already contains a number of preconfigured storage types, such as high rack storage, fixed bin storage, and bulk storage. You can change these default values as required, or you can create new storage types as additions or replacements. A main section of the Warehouse Management (WM) Customizing settings is storage-type-specific. A type of master data record is assigned to each storage type in Customizing. You make the basic settings for controlling putaway and stock removal processes separately.

Interim storage areas play an important role. In a standard SAP ECC system, they can be recognized by their key (which starts with a 9). These storage types form a type of bridge between WM and Inventory Management. Typical examples of interim storage areas are goods receipt zones and goods issue zones.

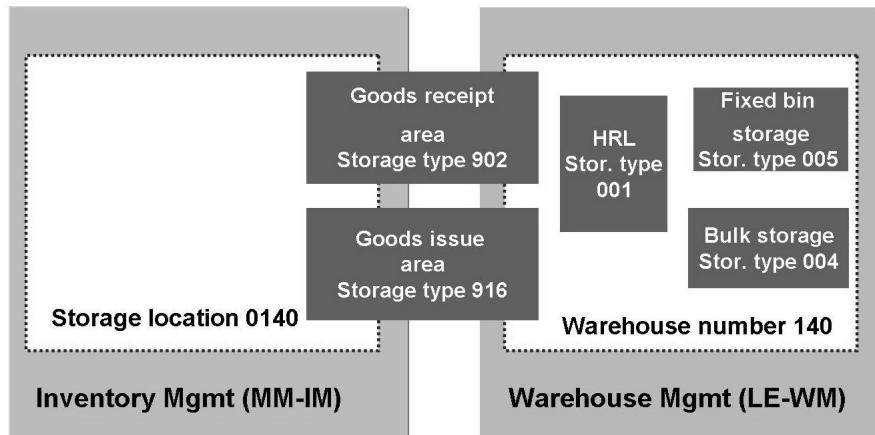


Figure 10: Interim Storage Areas

Each goods movement that affects both Inventory Management and Warehouse Management is therefore processed using an interim storage area.

You create **storage sections** within storage types in order to further subdivide your storage space. There are various criteria you can use to divide the storage space into storage sections. The material to be put away in the storage type often plays a decisive role, for example, because fast-moving items have to be moved into front sections that are more readily accessible, or because perishable goods must be stored in a refrigerated area. Depending on the requirements, you can use indicators to create links between materials and storage sections. The system only takes storage sections into account during putaway.



Caution: Even if you do not need to further divide the storage type space, you must still create at least one storage section for each storage type.

Picking areas are part of the same hierarchical level as storage sections. You can use picking areas to divide the space in a storage type for stock removal reasons. In contrast to the storage section, the picking area is an optional factor.

Storage bins are master data that you create within a storage section. They are discussed in a separate lesson.

Positioning Within the Overall System of Logistics Organizational Units

In Customizing, you must connect the organizational units specific to Logistics Execution to other, often superordinate, organizational units in order to be able to map logistics processes.

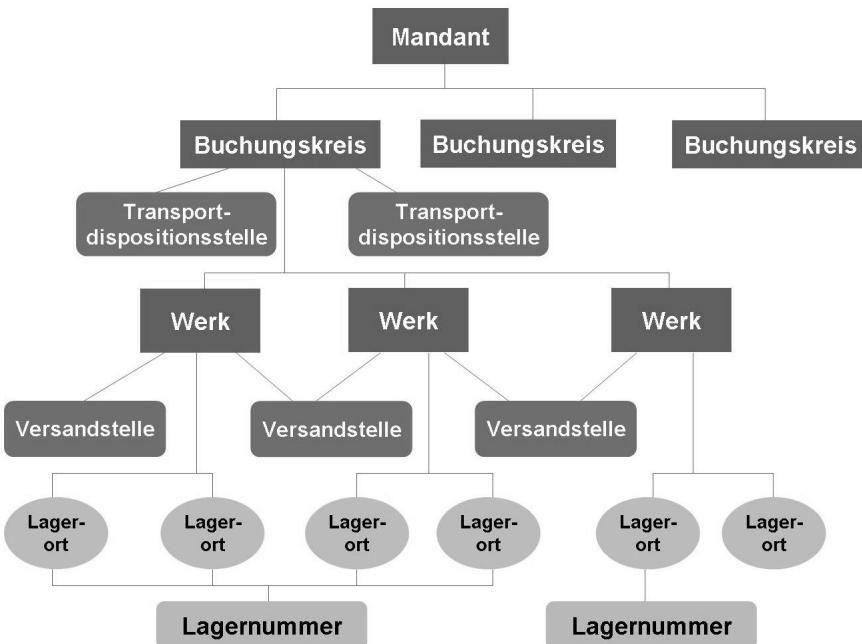


Figure 11: Positioning Within the Overall System

The **transportation planning point** is usually assigned to a **company code**. This specific connection between the transportation planning point and the organizational unit, at which level the system calculates the balance, profit, and loss, is required for calculating and settling freight costs. You can only connect a transportation planning point to one company code.

Shipping points are assigned to **plants**. Plants are organizational units that are used in various logistics applications and subapplications (Production Planning and Control, Plant Maintenance, Inventory Management). They are usually used to map production locations or, more generally, company subsidiaries. A shipping point, if it corresponds to the spatial factors, can be assigned to several plants at the same time. A plant can have more than one shipping point.

A **warehouse number** is always linked to at least one combination of plant and **storage location**. This means that a connection is created between Warehouse Management and Inventory Management, because the storage location is the organizational unit for quantity-based inventory management. Only by assigning the warehouse number to a plant-storage location combination can you use the functions of Warehouse Management. You do not, however, have to connect every storage location that has been created within a plant in Inventory Management to a warehouse number. Certain stocks, for example, packaging materials or consumable materials that are stored in fixed bins, do not require storage bin management. You can link several plant-storage location combinations to **one** warehouse number; in this case, the spatial situation is the most influential criteria. However, you cannot simultaneously assign a plant-storage combination to two or more warehouse numbers.

Exercise 3: Assignment of Warehouse Numbers to Plant-Storage Location Combinations

Exercise Objectives

After completing this exercise, you will be able to:

- Describe the connection between Warehouse Management and Inventory Management in Customizing

Business Example

Creating the link between a warehouse number and a combination of plant and storage location is an important step in Customizing for Logistics Execution. To improve understanding of the process shown throughout the course, it might be helpful to display the relevant Customizing table.

Task:

In Customizing, check the assignment of your warehouse number **1xx** (key: **140** + group number **##**, for example 145 for group 05) to a plant-storage location combination. Search for the combination of plant **1200** and your group-specific storage location **01xx** (key: **0140** + group number **##**).

1. Call up the assignment table in Customizing.



Hint: You only have display authorization for Customizing. To display the table, confirm the system message with *Enter*.

2. Could you assign your plant/storage location combination to another warehouse number **as well?**

Solution 3: Assignment of Warehouse Numbers to Plant-Storage Location Combinations

Task:

In Customizing, check the assignment of your warehouse number **1xx** (key: **140** + group number **##**, for example 145 for group 05) to a plant-storage location combination. Search for the combination of plant **1200** and your group-specific storage location **01xx** (key: **0140** + group number **##**).

1. Call up the assignment table in Customizing.



Hint: You only have display authorization for Customizing. To display the table, confirm the system message with *Enter*.

- a) Go to *Tools* → *Customizing* → *IMG* → *Execute Project*
To access the **Implementation Guide (IMG)**, choose *SAP Reference IMG*.
 - b) In the Implementation Guide, choose *Enterprise Structure* → *Assignment* → *Logistics Execution* → *Assign Warehouse Number to Plant/Storage Location*.
To perform the *IMG Activity*, choose *Execute*
 - c) Choose *Position* to find the combination of plant **1200** and storage location **01xx** (**0140** + group number **##**).
2. Could you assign your plant/storage location combination to another warehouse number **as well?**

Answer: No. Multiple assignment of the same plant/storage location combination is not possible.



Lesson Summary

You should now be able to:

- Name the central organizational units in Logistics Execution and describe their basic functions
- Explain the organizational subdivision of warehouse numbers
- Position the organizational units specific to Logistics Execution within the overall system of logistics organizational units

Lesson: Storage Bins and Quants

Lesson Overview

In the Warehouse Management System, storage bins are master data that are created from the user menu or from Customizing. The stock overviews in the Warehouse Management System give you information about the current storage bin stocks for a material, in addition to information about various material movements to and from a storage bin.



Lesson Objectives

After completing this lesson, you will be able to:

- Explain the structure of a storage bin master record
- Define the term “quant”
- Create storage bins
- Check warehouse stocks at storage bin level

Business Example

If you want to manage material stocks at storage bin level, you must create storage bins as master data in SAP ECC. In this context, you must also decide whether bin stocks should be mixed or non-mixed storage, and whether existing bin stocks can be increased.

Constructing a Storage Bin Master Record

Storage bins are always created within **storage sections**. Storage sections divide up the area of a **storage type** according to various features, such as the inventory turnover of the stocks or the warehouse temperature. Within the entire warehouse complex (defined by the **warehouse number**), the storage type itself represents a storage space that should be separated in SAP ECC, at organizational level and usually also at a spatial level, from other storage spaces, such as high rack storage, fixed bin storage, and bulk storage.

You can assign a storage bin type when you create a **storage bin type**. This is particularly useful if the storage bins within a storage section have different dimensions. Bin types are categories that you define for each warehouse number in Customizing for Warehouse Management to specify the rough dimensions of storage bins, for example, “bin width 1m”.

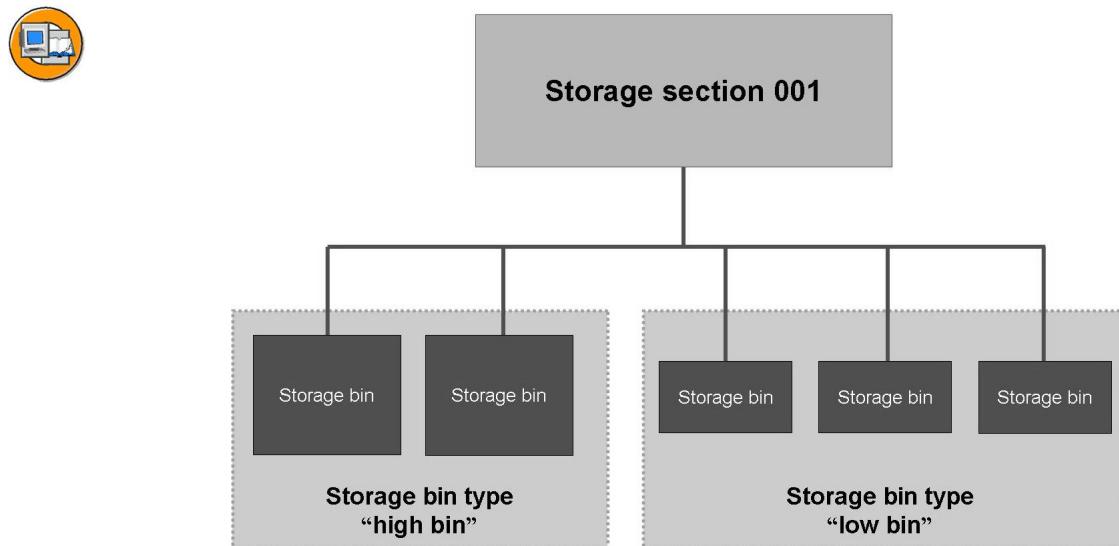


Figure 12: Storage Bin Types

Depending on the settings at storage type level, the system can take storage bin types into account during putaway. This means that you can avoid occupying storage bins with unsuitable load carriers. You also have the option of assigning the storage bins to be created to a picking area.

You can enter values for the maximum weight that can be placed on a storage bin, and can also use a neutral key figure as an abstract representation of the total capacity of the storage bin. However, the system only takes these into account if you have activated the relevant capacity check method in Customizing at storage type level.

You can block storage bins where necessary. You can add this block - separately for putaway and stock removal - to a single storage bin master record or to a storage bin list. The system cannot access blocked storage bins during putaway, stock removals, and stock transfers.

The Quant

In SAP ECC, the contents of a storage bin is called a **quant**. A quant is a material quantity in a storage bin. In the SAP ECC Warehouse Management system, materials can be viewed and moved in quants only. The actual material number is irrelevant, as is the unit of measure. However, there are default **criteria**, which the Warehouse Management system uses in putaways and stock removals to decide which material quantity forms a quant in a storage bin. The criteria are as follows:

- Material number
- Stock category
- Special stock assignment
- Plant and storage location assignment of the material

and if necessary

- Batch number

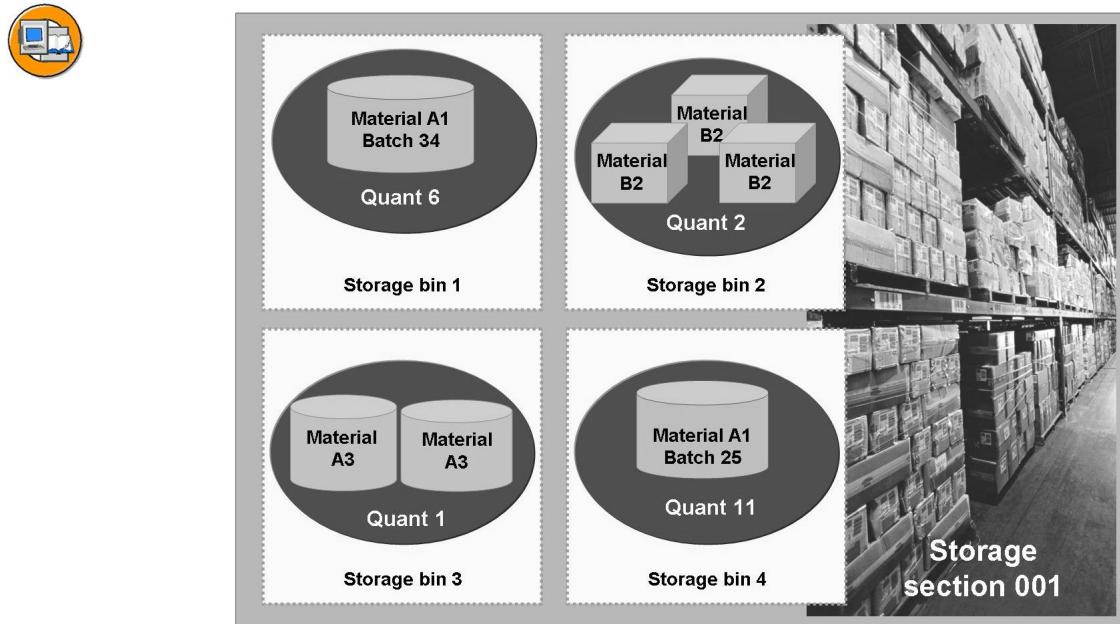


Figure 13: Quant

The criteria for stock type, special stock assignment, and plant and storage location assignment are inventory management information for the material. Inventory Management usually decides at posting which **stock type** the material quantity belongs to. This means that at goods receipt, you can post part of the material quantity into the unrestricted-use stock, and another part into quality inspection stock or blocked stock. The same applies to the **special stock assignment**: Partial quantities of a material can be flagged, for example, as project stock and others as customer consignment stock. If the inventory of a material is managed in various storage locations, for example, to map changes in ownership, the **plant/storage location assignment** of a specific material quantity is also important. Regardless of the decision Inventory Management has made via its postings, in the Warehouse Management system these characteristics must match for a material quantity if this quantity should form **one** quant in a storage bin. This means that if you want to put away the same material that was posted at goods receipt partially into the unrestricted-use stock and partially into quality inspection stock, at least two quants are always generated in Warehouse Management.

If you use Batch Management as a cross-component function, the **batch number** of a material quantity is also a quant characteristic. If you have activated the batch management requirement at material master level, you must enter the relevant

batch for each goods movement. In the Warehouse Management system, you should also be able to tell at any point which material quantity belongs to which batch. Quants are therefore always from the same batch.

Additions to Existing Stock and Mixed Storage

A storage bin that already contains a quant of a material can take on further material quantities of the same material if the remaining quant criteria match up (see above). The storage type containing the storage bin must permit **additions to existing stock**.

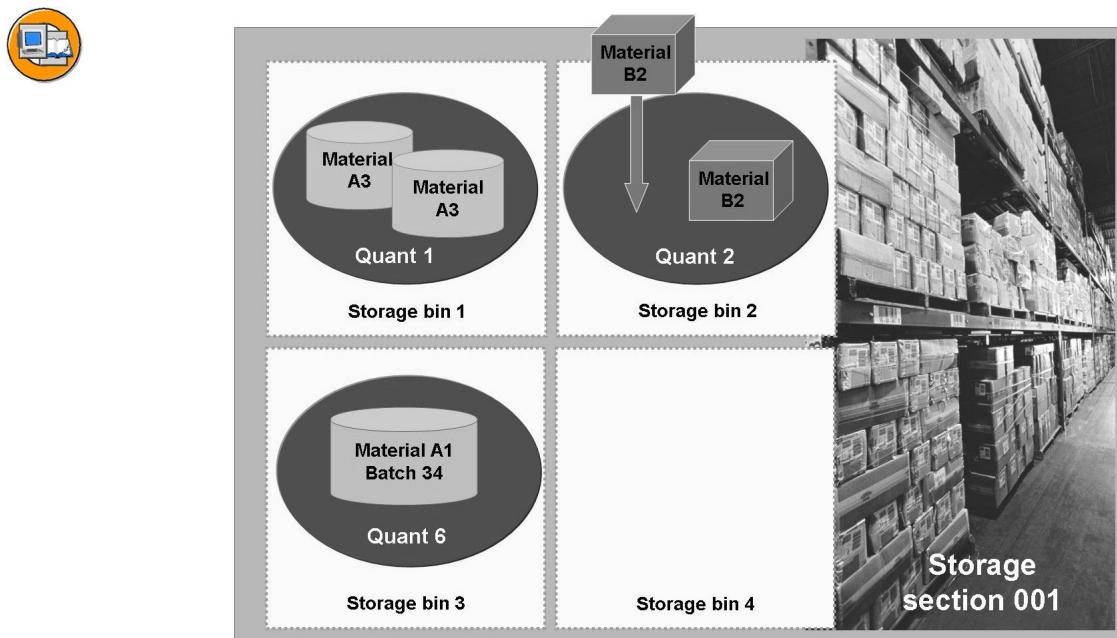


Figure 14: Addition to Existing Stock

A storage bin in a storage type that permits additions to existing stock can only ever contain one quant. However, the size of this quant can be increased and decreased by putaway and stock removal activities.



Caution: The goods receipt date of a material quantity is managed at quant level. If additions are made to existing stock, the goods receipt date of the new quant is lost. The quant always shows the oldest goods receipt date. If you want to perform stock removals according to the “first-in-first-out” (FIFO) principle, it is advisable to prohibit additions to existing stock.

If you want to store more than one quant in a storage bin, you must permit **mixed storage** in the storage type.

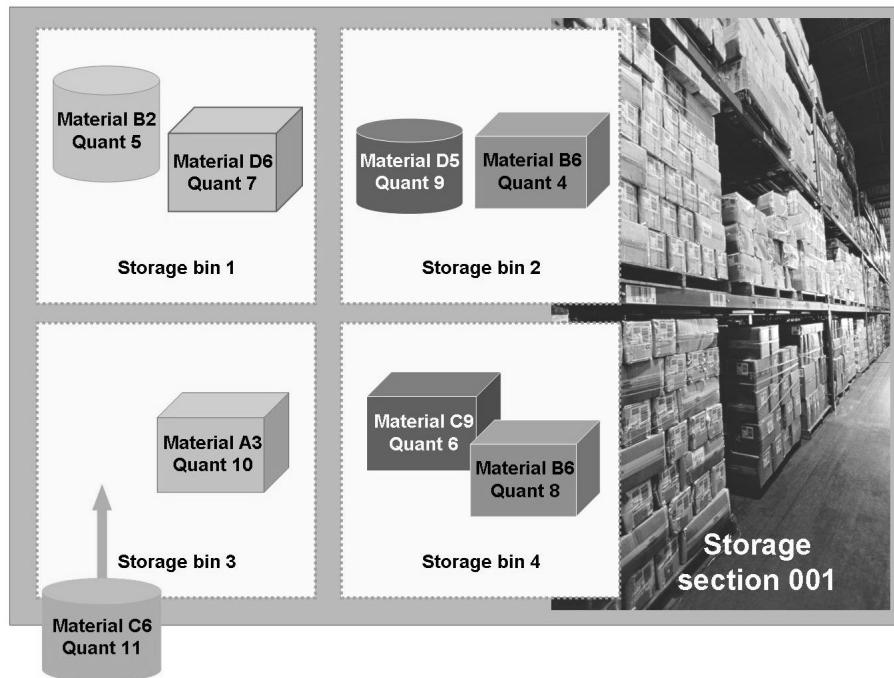


Figure 15: Mixed Storage

In mixed storage, you can store several materials and also, for example, several batches of the same material, in one storage bin. Various methods of capacity checking are available depending on storage type and putaway control. These can ensure that storage bins are not overloaded when additions are made to existing stock or for mixed storage.

During putaway and stock removal activities, quants are generated and some disappear. As long as a quant exists in the warehouse number (in other words, is contained in a storage bin) the quant has its own temporary data record. You can display this data record from the Warehouse Management stock overview. This data record contains essential inventory management information, such as the goods receipt date, shelf life expiration date, and batch number (where required), in addition to all storage-relevant information.

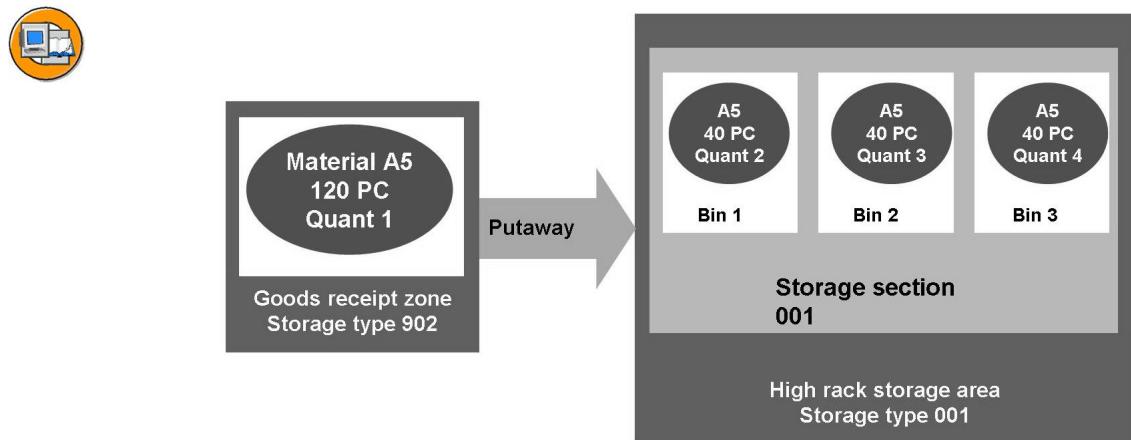


Figure 16: Quant Split

Example: After a goods receipt posting, a quant of 120 pieces of a material is in a storage bin in the goods receipt area. During putaway into the high rack storage area, the system splits this quant equally between three storage bins, according to various entries in the material master and Customizing. This means three new quants are generated that each consist of 40 pieces of the material. The original quant is deleted, as is its corresponding data record. In the goods issue process, quants “disappear” during stock removal.

Exercise 4: Storage Bins and Quants

Exercise Objectives

After completing this exercise, you will be able to:

- Create a storage bin
- Check storage bin stocks in the stock overview for Warehouse Management

Business Example

You want to create a new storage bin in the fixed bin storage area. You also want to check the stocks in your shelf storage area.

Task:

Create a new fixed bin with any description (for example, **BOX-##**), and block this bin for putaway.

1. Call up the transaction for creating single storage bins and enter the required data.
2. Block the new storage bin for putaway.
3. Unblock the bin.



Hint: You can remove the block directly in the master record of the storage bin. As an alternative, you can use a storage bin list, which you can find under *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Block*.

4. Display the storage bin stocks for your material, **LES02-##** in your warehouse number, **1xx**. Which storage type contains the material? The total quantity was split across how many storage bins?
5. Display the master record for one of the storage bins, and from there display the data record for the quant in the storage bin. Which storage section does the bin belong to? Determine the goods receipt date of the quant.

Solution 4: Storage Bins and Quants

Task:

Create a new fixed bin with any description (for example, **BOX-##**), and block this bin for putaway.

1. Call up the transaction for creating single storage bins and enter the required data.
 - a) Choose *Logistics* → *Logistics Execution* → *Master Data* → *Warehouse* → *Storage Bin* → *Create* → *Manually*
In the *Warehouse No.* field, enter your warehouse number **1xx** (140 + group number ##, for example, 145 for group 05), and use the input help to select storage type **005** (Fixed bin storage). In the *Storage Bin* field, enter a fixed storage bin description of your choice, for example, **BOX-00**.
 - b) Confirm with *Enter*. Other fields now become available. Use the input help in the *Storage Section* field to assign storage section **001**.
2. Block the new storage bin for putaway.
 - a) Set the indicator for the *Putaway block* and confirm with *Enter*. A symbol appears that means *Blocked for putaway*.
 - b) Use the input help to add a blocking reason. Save your entries. To exit the transaction, choose *Cancel* .

Continued on next page

3. Unblock the bin.



Hint: You can remove the block directly in the master record of the storage bin. As an alternative, you can use a storage bin list, which you can find under *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Block*.

- a) To check the new storage bin master record, call the record in display mode.

Choose *Logistics → Logistics Execution → Master Data → Warehouse → Storage Bin → Display*.

- b) Enter the warehouse number **1xx**, storage type **005**, and storage bin **BOX-##** and choose *Enter*: You will see the blocking indicator.
- c) To unblock your new storage bin, use the transaction *Block/Unblock Several Storage Bins Simultaneously*. Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Block → Storage Bin Selection*.
- d) Enter your warehouse number **1xx** and in the *Storage Type* field, enter **005**. To execute the selection, choose *Execute* Next to storage bin **BOX##**, the column *PB (Putaway Block)* now contains an **X**.
- e) Select the storage bin and choose *Unblock* . On the next screen, select the *Putaway Block* indicator and confirm with *Enter*. Save the changes.

4. Display the storage bin stocks for your material, **LES02-##** in your warehouse number, **1xx**. Which storage type contains the material? The total quantity was split across how many storage bins?

- a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.

Enter the key for your warehouse number and material **LES02-##**. Confirm with *Enter*. The material is in the shelf storage area (storage type **002**).

- b) Place the cursor on the plant/storage location stock highlighted in white, and choose *Bin Stocks*. The total quantity of the material is split equally across 10 storage bins.

Continued on next page

5. Display the master record for one of the storage bins, and from there display the data record for the quant in the storage bin. Which storage section does the bin belong to? Determine the goods receipt date of the quant.
 - a) To access the master record for a storage bin, click one of the storage bin coordinates. The storage bin belongs to storage section **001**.
 - b) Choose the *Stock* tab page. In the *Stock per Storage Bin* area, select the line containing the material and quantity and choose *Quant* (on the bottom left of the screen).



Hint: Each quant has a number for identifying its data record in the database. You can find this number in the storage data area, under the storage bin coordinates. This number does not have any effects on controlling putaway or stock removal processes.



Lesson Summary

You should now be able to:

- Explain the structure of a storage bin master record
- Define the term “quant”
- Create storage bins
- Check warehouse stocks at storage bin level

Lesson: Material Master and Customer Master

Lesson Overview

Material-specific settings have an immense effect on process control in Logistics Execution. At master data level, you can specify into which storage type material is put away, and from which storage type it is removed from stock. You can also enter the standard palletization data for a material in the material master, in order to enable automation of putaway activities. The customer master can contain default values for data that controls the shipping process.



Lesson Objectives

After completing this lesson, you will be able to:

- Create the Warehouse Management views in a material master record
- In these views, differentiate between warehouse-number-specific and storage-bin-specific fields
- Maintain the fields in the Sales view of a customer record, which are relevant for the delivery process

Business Example

IDES AG wants to manage its material stocks in storage bins. This means that all existing material master records now require Warehouse Management data. To simplify the delivery processes, the customer master records should contain default values for shipping processing.

The Warehouse Management Views

The master data for a material is divided into views. In most cases, these views correspond to specific departments or activity areas in a company, for example, Sales and Distribution, Purchasing, and Accounting. Each of these views contains a collection of fields that are usually either indicators for accessing Customizing tables, or values for specific applications. These values are often default values. Warehouse Management has two specific views in the material master. Both views must be created in order to put away the material.

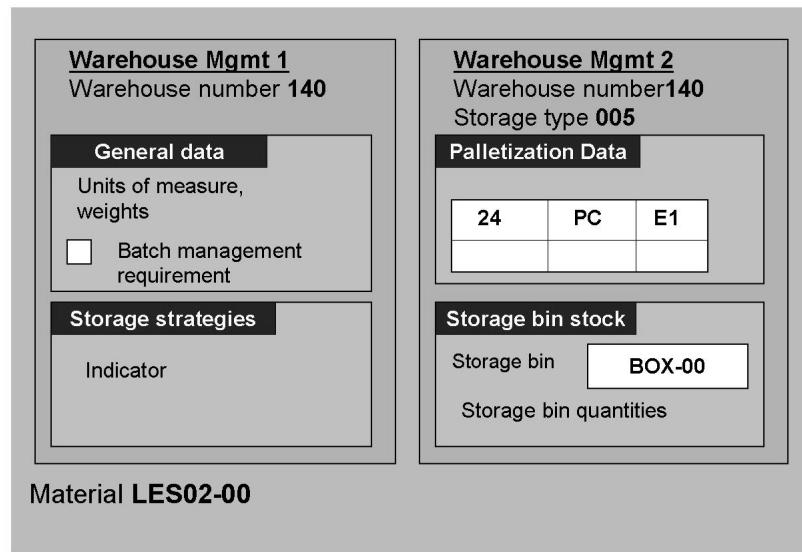


Figure 17: Warehouse Management Views

The first Warehouse Management view only contains fields whose entries are valid for a specific warehouse number. The second view also contains storage-type-specific information. When you create, change, and display the Warehouse Management views, you must always enter the warehouse number in which you want to store the material. If the material is used in more than one warehouse number, you must create the Warehouse Management views for each warehouse number.

You do not always have to enter values into the storage-type-specific fields in the second Warehouse Management view. These fields are mainly used for materials with fixed bins. Therefore, if you store a material in fixed bin storage, you must assign its fixed bin in this view, in the *Storage Bin* field. This means that during putaway, the Warehouse Management system can automatically assign the bin to the material, and can also find it for use during stock removal.



Hint: When you create, change, and display the second WM view, you can only see the storage-type-specific fields if you have previously defined a default storage type when selecting the organizational units.

Palletization Data

In the second WM view, you can store palletization data for the material. The data is valid for one warehouse number.



Warehouse Management 2		
Material	LES02-00	
Warehouse number	140	
Palletization data		
LE quantity	BUn	SU type
24	PC	E1

Figure 18: Palletization Data

If the material master contains palletization data, the Warehouse Management system adopts this as default values for each putaway operation. If a material is regularly palletized in a certain way from production or a vendor, the system can use the default values in the material master to automatically distribute the overall putaway quantity, and perform storage bin determination.

To enter palletization data in the material master, you must first create suitable **storage unit types** in Customizing. Storage unit types are structural aids for putaway. They group together loading equipment (such as europallets, wire baskets, or tanks) that have similar physical properties. In Customizing, europallets are defined as storage unit type “Europalett”, wire baskets as “Wire basket”, and so on, for each warehouse number. In the material master, the storage unit types are used to specify the distribution of a certain material quantity (**loading equipment quantity**). This means that in a standard case where 24 pieces of a material are always put away onto a europallet, this standard distribution can be stored in the material master using the storage unit type “Europallet.”



Hint: The palletization data is only used as default values. If, in individual cases, the palletization is different from the data stored in the material master, you can manually change the proposed data before you perform the putaway.

Customer Master

In contrast to the generally multilayered material master record, a customer master record usually consists of only three views: the general data view, the company code view, and the sales area data view. In the *Sales Area Data* view, you can store default values for delivery processing.

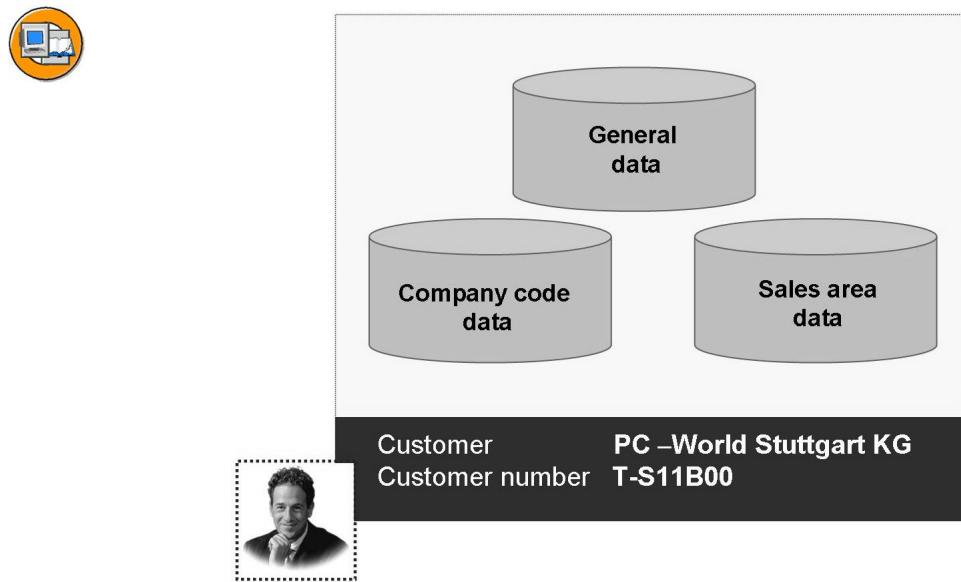


Figure 19: Customer Master

The general data view contains the customer's address, and also, for example, the customer's bank details. The company code view contains, among other things, terms of payment and any dunning procedures. The sales area data, in particular the subarea for delivery processing, can contain **shipping conditions** and **delivering plants** as default values for sales documents. You can also set indicators for order combination (during delivery creation) and complete delivery.

The system requires the issuing plant and the shipping condition in order to determine the **shipping point**. In Logistics Execution, the shipping point is the organizational unit required to map delivery processes. It is determined in the sales document for each document item. During delivery creation, the system can use the shipping point determined in this way, or a shipping point that was assigned manually. The shipping point is also a source of information for scheduling in the shipping process, which the system performs according to the settings in the sales document.

Exercise 5: Material Master and Customer Master

Exercise Objectives

After completing this exercise, you will be able to:

- Add the Warehouse Management views to the material master record
- Store default values for the outbound process in the customer master record

Business Example

In order to be able to put away the base **LES04-##** into your warehouse number at the next goods receipt, you need to add the two Warehouse Management views to its material master record. The flat screen monitor **LES02-##**, which is already stored in the shelf storage area, should, in the future, be stored in a fixed bin. Since both these materials are regularly sold from the stocks of plant **1200** to PC-World Stuttgart KG (customer number **T-S11B##**), you enter this plant as the delivering plant in the customer master record.

Task 1:

Create both Warehouse Management views for your warehouse number **1xx** for material **LES04-##**.

1. Call up transaction MM01 for creating material master data in order to add the required views to the master record for your material.
2. Select the two Warehouse Management views and confirm your selection by choosing *Enter*.
3. In the next step you specify the organizational levels to which the data to be created will refer: Your warehouse number **1xx**.
4. Create a standard palletization for the base **LES04-##**. 24 pieces of the material should be stored on a europallet of storage unit type **E1**.
5. Repeat steps 1 through 3 for material **LES02-##**. Then add data for the storage type **005**.
6. Assign the flat screen monitor **LES02-##** to its future fixed bin **BOX-##**, or use the input help to choose one of the other bins in storage type **005**.

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Task 2:

Enter plant **1200** as the delivering plant in the master record for customer **T-S11B##**.

1. Call up the sales area data in the customer master record for customer **T-S11B##** in change mode.



Hint: After you enter the customer number, you can display the sales areas that can be used for this customer by choosing *Customer's sales areas*. Place the cursor on the line containing the desired sales area, and confirm your selection with *Enter*.

2. Enter plant **1200** as the delivering plant in the master record for customer **T-S11B##**. Check the shipping condition. The description (text beside the field *Shipping condition*) should correspond to your group number ## (## Standard - SCM601)

Solution 5: Material Master and Customer Master

Task 1:

Create both Warehouse Management views for your warehouse number **1xx** for material **LES04-##**.

1. Call up transaction MM01 for creating material master data in order to add the required views to the master record for your material.
 - a) Choose *Logistics* → *Logistics Execution* → *Master Data* → *Material* → *Material* → *Create* → *Immediately*.
 - b) Enter material number **LES04-##** and confirm with *Enter*.



Hint: In the status line, the system informs you that it has copied the material type and industry from the existing master record for the material. Confirm this message to access the *View Selection*.

2. Select the two Warehouse Management views and confirm your selection by choosing *Enter*.
 - a) Both Warehouse Management views are directly underneath the views for *General Plant Data/Storage*.
 - b) Confirm your selection with *Enter*.
3. In the next step you specify the organizational levels to which the data to be created will refer: Your warehouse number **1xx**.
 - a) Enter your warehouse number **1xx**.
 - b) To return to the data screens for the Warehouse Management views, confirm your input with *Enter*.

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4. Create a standard palletization for the base **LES04-##**. 24 pieces of the material should be stored on a europallet of storage unit type **E1**.
 - a) Select the second Warehouse Management view.
 - b) Enter the palletization data as follows:

LE quantity (loading equipment)	24
Un (Unit of measure)	PC
SUT (Storage unit type)	E1

Save your input.

5. Repeat steps 1 through 3 for material **LES02-##**. Then add data for the storage type **005**.
 - a) Choose *Logistics* → *Logistics Execution* → *Master Data* → *Material* → *Material* → *Create* → *Immediately*.
 - b) Enter the material number **LES02-##** and confirm. Choose *Enter* again to confirm the system message telling you that the material type and industry will be copied from the existing material master.
 - c) Select the two Warehouse Management views and confirm your selection by choosing *Enter*.
 - d) On the *Organizational Levels* screen, enter the following data:

Warehouse number	1xx
Storage Type	005

Confirm your entries with *Enter*. The system informs you that the material already exists and data has been added.

6. Assign the flat screen monitor **LES02-##** to its future fixed bin **BOX-##**, or use the input help to choose one of the other bins in storage type **005**.
 - a) Select the second Warehouse Management view. Enter **BOX-##** in the *Storage Bin* field, and save your input.
 - b) Alternative: Call the input help for the *Storage Bin* field and choose one of the existing bins.

Continued on next page

Task 2:

Enter plant **1200** as the delivering plant in the master record for customer **T-S11B##**.

1. Call up the sales area data in the customer master record for customer **T-S11B##** in change mode.



Hint: After you enter the customer number, you can display the sales areas that can be used for this customer by choosing *Customer's sales areas*. Place the cursor on the line containing the desired sales area, and confirm your selection with *Enter*.

- a) Choose *Logistics → Logistics Execution → Master Data → Partner → Customer → Change → Sales and Distribution*.

Input values:

Customer	T-S11B##
Sales Organization	1000
Distribution Channel	12
Division	00

- b) To access the *Sales Area Data* view, confirm your input with *Enter*. Choose *Sales Area Data*.
2. Enter plant **1200** as the delivering plant in the master record for customer **T-S11B##**. Check the shipping condition. The description (text beside the field *Shipping condition*) should correspond to your group number ## (## Standard - SCM601)
 - a) Go to the *Shipping* tab page and enter plant **1200** as the delivering plant in the relevant field.
 - b) Save your input.



Lesson Summary

You should now be able to:

- Create the Warehouse Management views in a material master record
- In these views, differentiate between warehouse-number-specific and storage-bin-specific fields
- Maintain the fields in the Sales view of a customer record, which are relevant for the delivery process



Unit Summary

You should now be able to:

- Name the central organizational units in Logistics Execution and describe their basic functions
- Explain the organizational subdivision of warehouse numbers
- Position the organizational units specific to Logistics Execution within the overall system of logistics organizational units
- Explain the structure of a storage bin master record
- Define the term “quant”
- Create storage bins
- Check warehouse stocks at storage bin level
- Create the Warehouse Management views in a material master record
- In these views, differentiate between warehouse-number-specific and storage-bin-specific fields
- Maintain the fields in the Sales view of a customer record, which are relevant for the delivery process



Test Your Knowledge

1. Name three organizational units specific to Logistics Execution.

2. At least one storage section must be created for each storage type.

Determine whether this statement is true or false.

- True
- False

3. Which of the following elements does not belong to the Warehouse Management organizational structure?

Choose the correct answer(s).

- A The storage section
- B The picking area
- C The storage location
- D The storage type

4. Warehouse numbers are linked to plant-storage location combinations in Customizing. Which of the following assignments are possible?

Choose the correct answer(s).

- A Several different plant-storage location combinations to one warehouse number
- B One plant and several of its storage locations to one warehouse number
- C One plant-storage location combination to two warehouse numbers
- D One plant and each of its storage locations to a different warehouse number

5. Mixed storage and additions to existing stocks are permitted or prohibited for each warehouse number.

Determine whether this statement is true or false.

- True
- False

6. The batch number is a quant characteristic.

Determine whether this statement is true or false.

- True
- False

7. The shelf life expiration date is a quant characteristic.

Determine whether this statement is true or false.

- True
- False

8. What function does the palletization data have in the second Warehouse Management view of the material master record?

Choose the correct answer(s).

- A Material to put away must always be palletized according to this palletization data.
- B The palletization data consists of default values for putting away the material.
- C Palletization data enables you to automate putaway.
- D The palletization data consists of default values for removing the material from storage.

9. Why do you need to maintain storage-type-specific fields in the material master?

Choose the correct answer(s).

- A To assign a fixed bin to the material
- B To store palletization proposals
- C To specify the minimum quantity for controlling replenishment
- D To set a storage type indicator

10. Which default values can you store in the customer master that relate to the shipping process?

Choose the correct answer(s).

- A The shipping point
- B The delivering plant
- C The shipping condition
- D The picking location



Answers

1. Name three organizational units specific to Logistics Execution.

Answer: Transportation planning point, shipping point, warehouse number

2. At least one storage section must be created for each storage type.

Answer: True

This statement is correct.

3. Which of the following elements does not belong to the Warehouse Management organizational structure?

Answer: C

The storage location is the organizational unit for quantity-based inventory management.

4. Warehouse numbers are linked to plant-storage location combinations in Customizing. Which of the following assignments are possible?

Answer: A, B, D

A plant-storage location combination can only be linked to **one** warehouse number.

5. Mixed storage and additions to existing stocks are permitted or prohibited for each warehouse number.

Answer: False

You make a decision about mixed storage and additions to existing stocks at storage type level.

6. The batch number is a quant characteristic.

Answer: True

This statement is correct.

7. The shelf life expiration date is a quant characteristic.

Answer: False

The shelf life expiration date is not a quant characteristic, but can be displayed at quant level.

8. What function does the palletization data have in the second Warehouse Management view of the material master record?

Answer: B, C

The palletization data in the second WM view in the material master are default values for putaway. It enables you to almost completely automate putaway.

9. Why do you need to maintain storage-type-specific fields in the material master?

Answer: A, C

The storage-type-specific fields must be maintained for all fixed bin materials. At storage type level, you can also store quantities for regular replenishment of a fixed bin. In contrast, you assign storage type indicators and palletization proposals for each warehouse number.

10. Which default values can you store in the customer master that relate to the shipping process?

Answer: B, C

In the customer master, you can store the delivering plant and the shipping condition as default values for the shipping process.

Unit 3

Goods Receipt Processes

Unit Overview

Logistics Execution offers you two basic forms of goods receipt process, which will be explained in this unit.

- Goods receipt for purchase order with subsequent putaway
- Inbound delivery for purchase order, putaway for inbound delivery, and subsequent goods receipt posting for the inbound delivery



Unit Objectives

After completing this unit, you will be able to:

- Explain the technical posting process of a goods receipt for a purchase order, with subsequent putaway
- Create a purchase order in Purchasing
- Post a goods receipt for this purchase order in Inventory Management
- Display the transfer requirement generated by the goods receipt posting, and interpret its contents
- Explain the function of transfer orders
- Create a transfer order with reference to a transfer requirement
- Confirm a transfer order
- Track the putaway process in the stock overview
- Describe the flow of the goods receipt process using inbound deliveries
- Explain the function of inbound deliveries
- Create an inbound delivery for a purchase order
- Call up and interpret the data relevant for putaway in the inbound delivery document
- Create and confirm a transfer order for an inbound delivery
- Use the inbound delivery monitor
- Post the goods receipt for an inbound delivery
- Trace the putaway steps in the stock overview

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Lesson: Goods Receipt Posting for Purchase Orders

Lesson Overview

This lesson is part of the “Goods Receipt Processes” unit, which outlines the two basic forms of goods receipt processing in SAP ECC. In the procedure described in this and the subsequent lesson, we post the receipt of the material in Inventory Management and then perform the putaway.



Lesson Objectives

After completing this lesson, you will be able to:

- Explain the technical posting process of a goods receipt for a purchase order, with subsequent putaway
- Create a purchase order in Purchasing
- Post a goods receipt for this purchase order in Inventory Management
- Display the transfer requirement generated by the goods receipt posting, and interpret its contents

Business Example

IDES AG procures materials from various vendors. After the goods receipt is posted, delivered goods are placed into the goods receipt zone.

Process Flow: Purchase Order and Goods Receipt Posting

Purchasing from vendors and from other plants within your own company is handled in SAP ECC using documents. Employees can report requirements for externally-procured materials to the Purchasing department using **purchase requisitions**. For one-time transactions or for new contacts, Purchasing can first create a **request for quotation** and enter a corresponding **quotation** at a later date. The system supports the buyer in comparing quotations from various vendors. A **purchase order** can refer to a quotation, but also directly to a requirement coverage request.

Master data plays a particularly important role in this context; goods procured externally have a separate Purchasing view in their **master data**. Vendors usually receive a **vendor master record** that contains address data, accounting data, and default values for purchase order processing (such as delivery conditions). If the same material is procured regularly from a specific vendor with fixed conditions (prices, purchase quantities, delivery times), you can create a **purchasing information record** for the relevant combination of material and vendor. The system accesses this master data when purchasing documents are created, and enters data in the relevant fields.

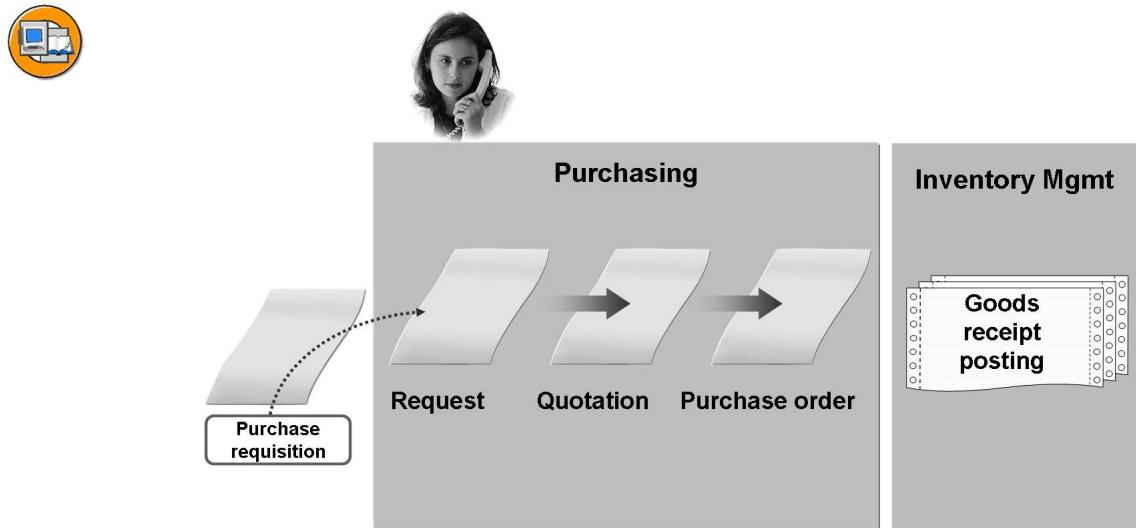


Figure 20: Purchasing Documents

If, after the goods have arrived, the goods receipt is posted for the purchase order in Inventory Management, the system copies the data from the relevant reference document. The purchase order contains information for each item about the receiving plant and the receiving storage location, if already fixed. If the storage location is missing from the purchase order, or if the goods receipt should be posted in a different storage location than entered in the purchase order, you enter or change the relevant item in the detail data. Depending on your system settings, partial goods receipts are also possible.

During a goods receipt posting, you also decide whether the delivered material should be immediately posted into the **unrestricted-use** stock, or first into **quality inspection** or **blocked** stock. Any increases to the material stocks are documented in a **material document**. Any value-based changes are documented in (at least) one **accounting document**.

Goods Receipt Posting and Transfer Requirements

During a goods receipt posting, the system checks each PO item to see whether the plant-storage location combination in the PO or GR is warehouse-managed, and therefore whether it is assigned to a warehouse number. If it is, an additional tab page appears at item level, *WM* (Warehouse Management).

If the goods receipt is posted into a warehouse-managed storage location, the system determines the assigned warehouse number and generates a **transfer requirement** in addition to the material and accounting documents. This document is the basis for the subsequent putaway. At the same time, the system posts the new material quantity into the **goods receipt zone for external receipts**, which is an **interim storage area** in the receiving warehouse. This material quantity

is shown as a **quant** in the interim storage type. (If the goods receipt posting includes different materials or batches, or if a partial quantity was posted into special stock or blocked stock, for example, then several quants are generated.)

→ **Note:** The interim storage area “goods receipt zone for external receipts” is preconfigured in SAP ECC with the key **902**.

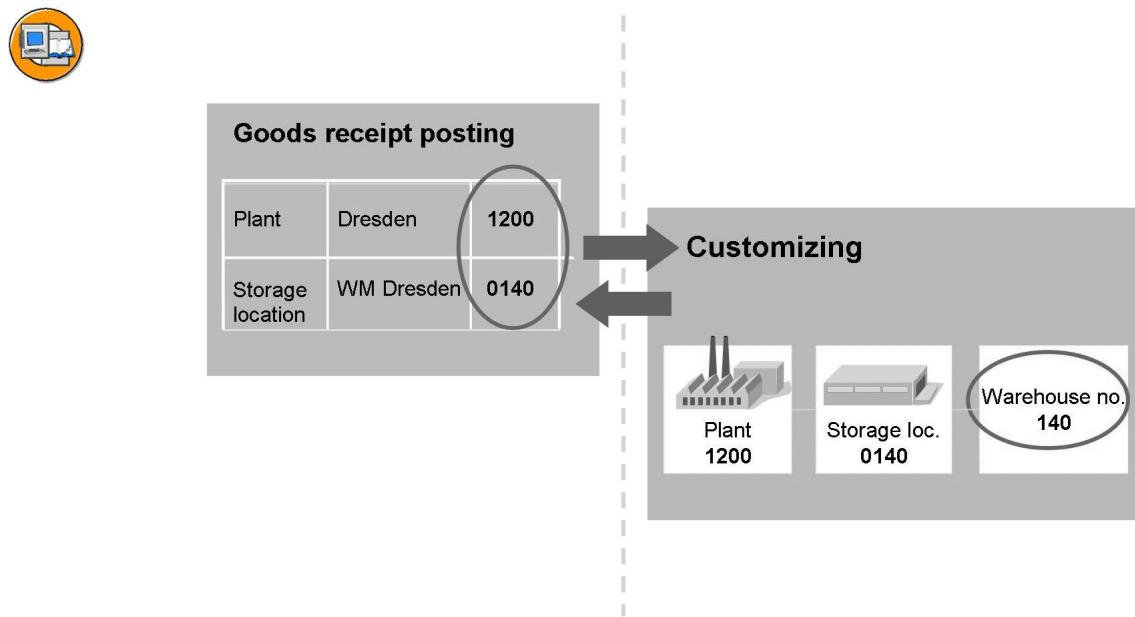


Figure 21: Goods Receipt Posting Into Warehouse-Managed Storage Location

In both Inventory Management and Warehouse Management, the flow of the goods receipt process is controlled using **movement types**. The Warehouse Management system has its own set of movement types that are linked to their Inventory Management counterparts in Customizing tables. The document header of a transfer requirement shows both movement types.

→ **Note:** A movement type is a set of Customizing parameters that control a goods movement. Each movement type is given a three-character numerical key. Movement type **101**, for example, controls goods receipts for various preceding documents in Inventory Management. In many cases, the key for the Warehouse Management movement type is the same as the “partner movement type” in Inventory Management. In other cases, different Inventory Management movement types are summarized into a single movement type in the Warehouse Management system (for example, stock transfers), or several Warehouse Management movement types are assigned to one Inventory Management movement type.

Warehouse Management movement type 101 (goods receipt for purchase order), is assigned in Customizing to interim storage area 902 (Goods receipt zone for external receipts). During a goods receipt posting for a purchase order, the system is able to use the links described above to map the material quantities as quants in this storage type. The **transfer order**, which is used in the Warehouse Management system to actually perform putaway, refers to the transfer requirement.

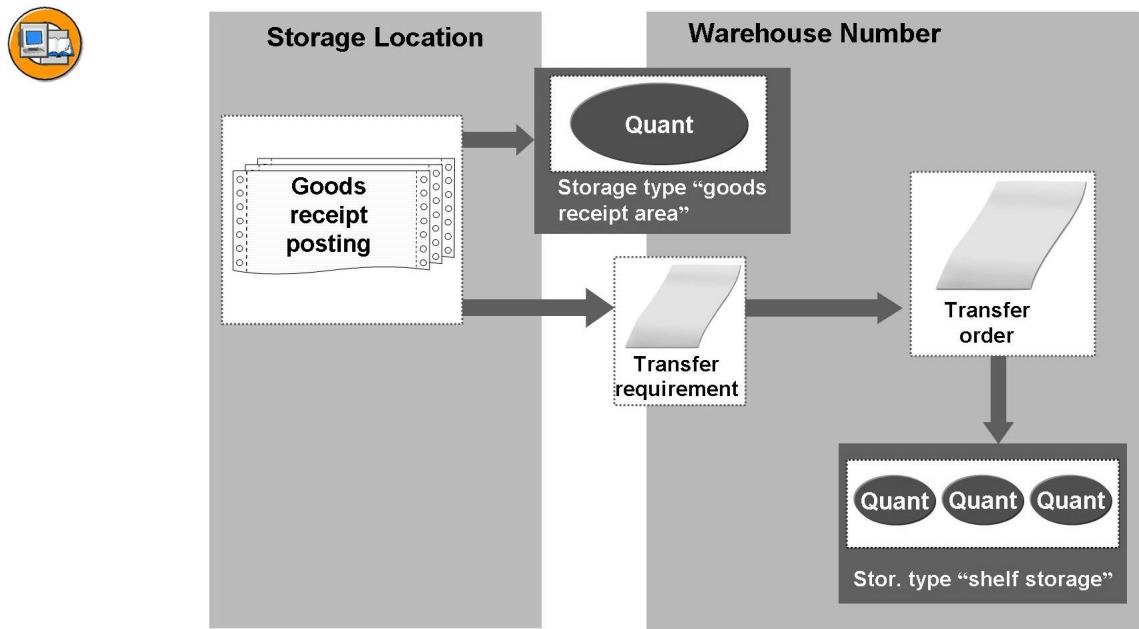


Figure 22: Transfer Requirement and Goods Receipt Zone

Interim storage areas also have storage bins. These can be created permanently, but can also be generated by the system for specific transactions. In SAP ECC, these storage bins are called **dynamic** storage bins because they are always generated in connection with a goods receipt or goods issue process, and only continue to exist until the process is complete. The storage bin coordinate is usually the document number of the reference document used for the Inventory Management posting, such as the purchase order number or the number of the work order.

Exercise 6: Goods Receipt Posting for Purchase Orders In a Warehouse-Managed Storage Location

Exercise Objectives

After completing this exercise, you will be able to:

- Post a goods receipt for a purchase order and check this process step in the Warehouse Management system

Business Example

The vendor C.E.B Berlin orders 120 pieces of base **LES04-##**. The ordered goods have arrived and are posted into the unrestricted-use stock in a warehouse-managed storage location in the Dresden plant.

Task:

In Inventory Management, post the goods receipt to an existing purchase order for 120 pieces of material **LES04-##**. Check this material stock in your warehouse number, **1xx**, before and after the goods receipt posting.

- Check the stocks of material **LES04-##** in your warehouse number **1xx**.
- Post the goods receipt for a purchase order, which was created for you before the course, for 120 pieces of material **LES04-##**. Before you do this, check whether the purchase order contains the correct storage location **01xx** (0140 + group number ##).



Hint: To find your purchase order quickly using your material number **LES04-##**, choose the simplified search help *Search for PO H*. You can also use the input help for the document number field.

- Check the stock overview for your material **LES04-##**. Which storage type and which storage bin contain the quant?
- Display the transfer requirement generated by the goods receipt posting.

Solution 6: Goods Receipt Posting for Purchase Orders In a Warehouse-Managed Storage Location

Task:

In Inventory Management, post the goods receipt to an existing purchase order for 120 pieces of material **LES04-##**. Check this material stock in your warehouse number, **1xx**, before and after the goods receipt posting.

1. Check the stocks of material **LES04-##** in your warehouse number **1xx**.
 - a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.
Enter your warehouse number **1xx** and the material number **LES04-##**, and confirm with *Enter*.
 - b) The system informs you that *no quants were selected*. This means that there is no stock of this material in your warehouse number.

Continued on next page

2. Post the goods receipt for a purchase order, which was created for you before the course, for 120 pieces of material **LES04-##**. Before you do this, check whether the purchase order contains the correct storage location **01xx** (0140 + group number ##).



Hint: To find your purchase order quickly using your material number **LES04-##**, choose the simplified search help *Search for PO* . You can also use the input help for the document number field.

- a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order; Order; Other Transactions → Enter Goods Receipt for Purchase Order*.
- b) To find your purchase order using your material number **LES04-##**, choose the simplified search help *Search for PO* . Enter the material number in the *Material Number* field and choose *Find*. Two purchase orders are displayed in the lower third of the screen. To perform the goods receipt posting, double-click on the first purchase order to display it. To close the document display, choose *Close Search Results* .
- c) If you have not yet opened the detail view, choose *Detail data*. On the *Where* tab page, you should see the following data:

Plant	Dresden	1200
Storage location	LE Dresden ##	01xx (0140 + group number ##)

- d) Set the *Item OK* indicator (lower edge of the screen) and save your entries.



Hint: When you close the detail data, the box appears next to the material description.

Continued on next page

3. Check the stock overview for your material **LES04-##**. Which storage type and which storage bin contain the quant?
 - a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.
 - b) In the goods receipt zone (storage type **902**) the system now shows 120 pieces of the material as *Available Stock*.
 - c) In the stock overview, select the line with the plant/storage location stock, and choose *Bin Stocks*. The bin coordinate is the purchase order number. To display the (temporary) storage bin master record, place the cursor on the coordinate and left-click.
4. Display the transfer requirement generated by the goods receipt posting.
 - a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Create Transfer Order → For Material*.
 - b) Input values (usually proposed by the system):

Warehouse Number	1xx
Material	LES04-##

Confirm your entries with *Enter*.

- c) Place the cursor on the transfer requirement document number and left-click.
- d) To display the document header, choose *Header* .



Lesson Summary

You should now be able to:

- Explain the technical posting process of a goods receipt for a purchase order, with subsequent putaway
- Create a purchase order in Purchasing
- Post a goods receipt for this purchase order in Inventory Management
- Display the transfer requirement generated by the goods receipt posting, and interpret its contents

Lesson: Putaway with Transfer Orders

Lesson Overview

This lesson deals with the function of the transfer order in the goods receipt process (inbound process), and also discusses the display for putaway operations in the Warehouse Management stock overview.



Lesson Objectives

After completing this lesson, you will be able to:

- Explain the function of transfer orders
- Create a transfer order with reference to a transfer requirement
- Confirm a transfer order
- Track the putaway process in the stock overview

Business Example

The delivered goods that were placed into the goods receipt zone should be moved into the warehouse and put away using the Warehouse Management system.

Putaway Process with Transfer Orders

A goods receipt posting for a purchase order in a storage location with Warehouse Management generates a **transfer requirement** for planning the subsequent putaway. At the same time, the received material quantity is posted as **quant(s)** into the goods receipt zone, which is an interim storage area in the receiving warehouse number. From there, the material to put away is posted into the warehouse itself using a **transfer order**. The transfer order, a type of “instruction” for the warehouse employee, refers to the transfer requirement and copies various essential information from the requirement. The employee reports the end of the operation to the system by **confirming** the transfer order.

→ **Note:** Confirmation of the transfer order might not be necessary, depending on your Customizing settings at storage type level.

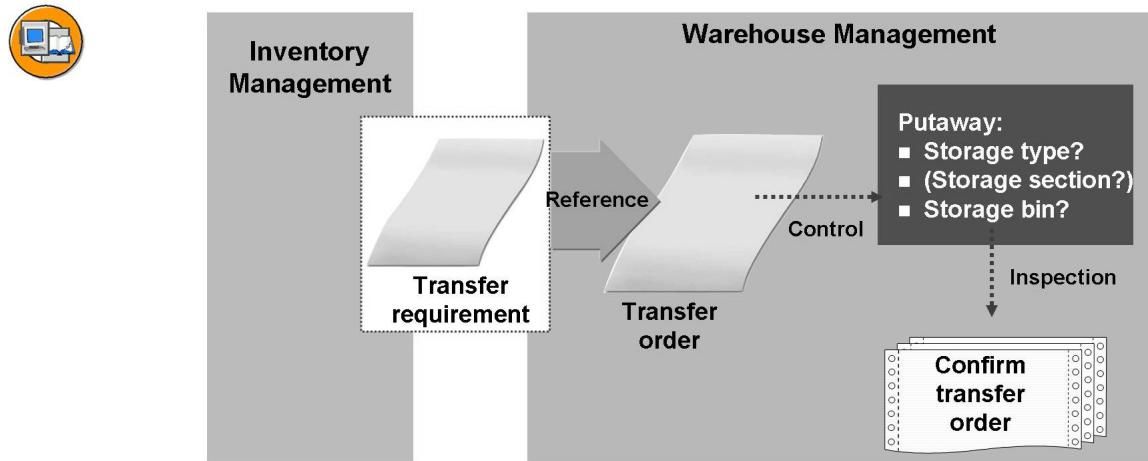


Figure 23: Putaway Process with Transfer Orders for Transfer Requirements

If quantity differences arise (breakages, theft) or are only recognized at putaway (underdelivery), these must be noted when the transfer order is confirmed. The storage location stocks are then corrected.

Transfer Order for Putaway

In SAP ECC, all warehouse movements (putaways, stock removals, and stock transfers) are performed using **transfer orders**.

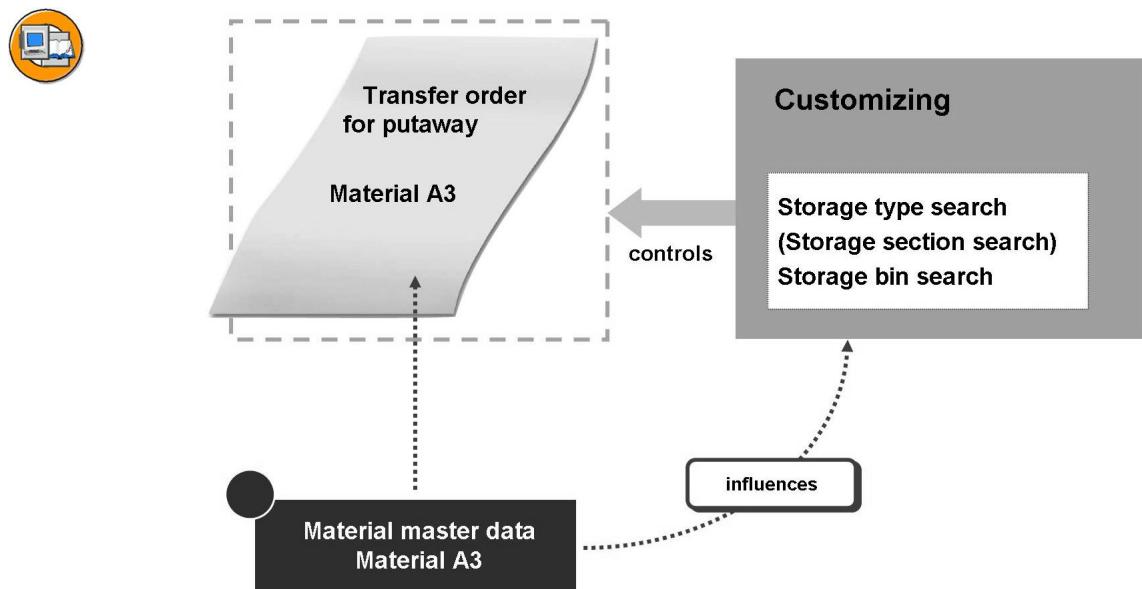


Figure 24: Controlling Putaway

In a putaway operation, the system first determines the target **storage type**. If a material should regularly be put away into a specific storage type, you set the relevant indicator in the *Warehouse Management* view of the master record. During each putaway, the system checks the master data of the materials involved to see whether this indicator is set, and targets the relevant storage types. The stock type and special stock assignment can similarly influence storage type determination.

If, during configuration of the determined storage type, you set that the **storage sections** are checked during each putaway, the system also performs a storage section determination. This means that the system searches for a suitable storage section within the storage type. Here, too, you can set an indicator in the master record of the material to put away that has an effect on the determination.

The last step is always determination of a suitable **storage bin**. This is dependent on the putaway strategy, which was assigned in Customizing to the storage type determined in the first step. In this way, for example, the fixed bin specified in the material master or the next empty bin for random putaway, can be selected and recommended for putaway.

 **Note:** You can only assign one putaway strategy for each storage type. You can also check whether the **storage unit type** for the load carrier to which the material will be put away is permitted in the storage type determined, and whether the storage unit type is suitable for the storage bins in this storage type.

The data, determined in this sequence, is mainly only default values. If you want to put a material away into a different storage type, storage section, or storage bin than those planned according to the Customizing settings, you can change the default data in the transfer order manually.

Stock Split in Transfer Orders

Before the Warehouse Management system determines storage types, storage sections, and storage bins for the material quantities to put away, it first checks in the second WM view of the relevant master record to see whether there is any **palletization data** for the warehouse number. If the material master contains entries for the distribution of loading equipment quantities to storage unit types, the system displays the data on the initial screen of the transfer order as a proposal for palletization of the total quantity.

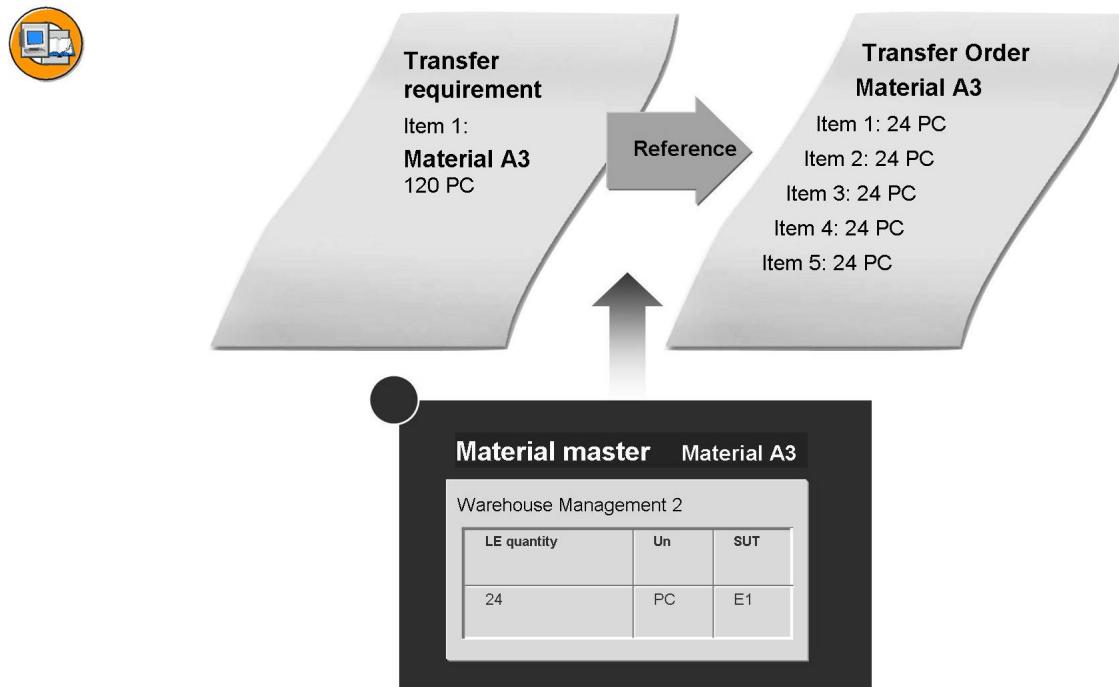


Figure 25: Palletization of the Material to Put Away

If, as in the example, the material master specifies that 24 pieces of a material should be put away onto a europallet with storage unit type **E1**, then the total quantity of 120 pieces is split across five storage units. The system generates one transfer order item for each storage unit. If the transfer order is created in the **foreground**, you can make changes to both the palletization and the bin determination for this document item.

→ **Note:** If an error message occurs, choose *Environment* to call up a *Bin Determination Log*. You can then see the point at which the determination process failed.

Complete Customizing settings and palletization data in the material master allow you to automate the putaway processes to a large degree.

→ **Note:** The transfer order can be created in the background **immediately after** the goods receipt posting with reference to the transfer requirement. However, it is also possible to generate transfer orders **automatically** for transfer requirements, using a report (RLAUTA10).

After the transfer order is created, the stock in the goods receipt zone is no longer **available**, but instead is being moved. This means that in the stock overview for Warehouse Management, it is always displayed as **stock to be removed from storage** for the goods receipt zone, and as **stock to putaway** for the receiving

storage type. You can therefore see immediately that the putaway operation is not yet complete. A transfer order for stock removal cannot access the quantities that are being moved.

Exercise 7: Putaway with Transfer Orders

Exercise Objectives

After completing this exercise, you will be able to:

- Create and confirm a transfer order with reference to a transfer requirement

Business Example

The goods receipt zone of your warehouse contains 120 bases for flat screen monitors, which you ordered from vendor C.E.B. Berlin. The goods receipt for this purchase order has already been posted, and now the delivered goods must be put away.

Task:

Create a transfer order to put away the bases, and confirm the order once putaway is complete.

1. Check the stocks of material **LES04-##** in your warehouse number **1xx**.
2. Find the transfer requirement for the stock of material **LES04-##**.
3. From the list, create a transfer order directly for the transfer requirement. Where does the palletization proposal that appears on the initial screen come from?
4. Check the stocks of your material **LES04-##**. Are you able to remove this stock (or a partial quantity of the stock) from storage?
5. Confirm the transfer order.
6. Check the stocks again.

Solution 7: Putaway with Transfer Orders

Task:

Create a transfer order to put away the bases, and confirm the order once putaway is complete.

1. Check the stocks of material **LES04-##** in your warehouse number **1xx**.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Warehouse Management)*.
Enter your warehouse number **1xx** and the material number **LES04-##**, and confirm with *Enter*.
 - b) The goods receipt zone (interim storage area **902**) contains 120 pieces of the material.
2. Find the transfer requirement for the stock of material **LES04-##**.
 - a) Choose *Logistics* → *Logistics Execution* → *Inbound Process* → *Goods Receipt for Purchase Order, Order, Other Transactions* → *Putaway* → *Create Transfer Order* → *For Material*.
 - b) Enter the following data:

Warehouse Number	1xx
Material	LES04-##

Confirm your entries by choosing *Enter*.

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3. From the list, create a transfer order directly for the transfer requirement. Where does the palletization proposal that appears on the initial screen come from?
 - a) Select your transfer requirement and choose *TO in Foregr.* from the application toolbar.
 - b) The system finds the palletization data in the material master in the second Warehouse Management view.



Hint: To find this data, go to *Logistics → Logistics Execution → Master Data → Material → Material → Display → Display Current Status.*

Enter your material number **LES04-##**. In the next step, *Select Views*, choose the *Warehouse Management 2* view. In the screen area for organizational areas, add your warehouse number **1xx**.

- c) On the initial screen, choose *Putaway Foreground*
 - d) Choose *Enter* to confirm the warning message *Check your entries*. The system proposes the next *TO work item* and issues the same warning message. Confirm again with *Enter* and repeat for the remaining document items. The initial screen appears again.

Note: The warning message in the status line is there to inform you that the *destination* data highlighted in red is only proposed data, and that you can overwrite it at this point.
 - e) Create the transfer order by saving.
4. Check the stocks of your material **LES04-##**. Are you able to remove this stock (or a partial quantity of the stock) from storage?
 - a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*. If you still have your stock overview open in a separate session, you can update the display by choosing *Refresh*
 - b) The material is now being moved, and is shown as both *stock to remove from storage* for the goods receipt zone, and as *stock to put away* for the shelf storage area.
 - c) As long as putaway is not complete, you cannot access these stocks. This means you still need to confirm the transfer order.

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5. Confirm the transfer order.
 - a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Confirm Transfer Order → Single Document → In One Step.*
To call up the transfer order for editing, choose *Enter*.
 - b) To confirm the transfer order, save your data.
6. Check the stocks again.
 - a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.
 - b) The 120 bases are now in the shelf storage area.

Exercise 8: Putaway with Differences (Optional)

Exercise Objectives

After completing this exercise, you will be able to:

- Report differences at putaway, and clear them in Inventory Management

Business Example

During putaway, one of the bases falls off the forklift and breaks. You must report this loss when you confirm the transfer order, and then clear it.

Task:

Create a purchase order, post the goods receipt for the purchase order, and put the material away using a transfer order. Report the difference when you confirm the transfer order. Clear the shortfall quantity in Inventory Management.

- Create a purchase order for 72 pieces of material **LES02-##** for plant **1200** and your storage location **01xx**. Post the goods receipt for this purchase order. Make a note of the document number: _____

Enter the following data at header level:

Vendor	1000
Purchasing Org.	1000
Purch. Group	000
Company Code	1000

- Put away the bases using a transfer order in your warehouse number **1xx**. When you confirm the transfer order, you report a difference of one piece.
- Check the stocks of material **LES02-##** in your warehouse number **1xx**.
- Clear the difference in Inventory Management, and check the results in the stock overview for your warehouse number.



Hint: You must clear the difference that occurred during putaway in the same way that you would clear inventory differences.

Solution 8: Putaway with Differences (Optional)

Task:

Create a purchase order, post the goods receipt for the purchase order, and put the material away using a transfer order. Report the difference when you confirm the transfer order. Clear the shortfall quantity in Inventory Management.

1. Create a purchase order for 72 pieces of material **LES02-##** for plant **1200** and your storage location **01xx**. Post the goods receipt for this purchase order. Make a note of the document number: _____

Enter the following data at header level:

Vendor	1000
Purchasing Org.	1000
Purch. Group	000
Company Code	1000

- a) Choose (Create purchase order) *Logistics → Materials Management → Purchasing → Purchase Order → Create → Vendor/Supplying Plant Known*. At item level, enter your material number **LES02-##**, the order quantity **72**, the plant **1200**, and storage location **01xx** (0140 + group number ##). To create the purchase order, save your data.
- b) For the goods receipt posting, go to *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Enter Goods Receipt for Purchase Order*.
- c) Enter the document number of your purchase order from step a) in the field to the right of the field with the entry *Purchase order* and choose *Execute* 
- d) Set the *Item OK* indicator and post the goods receipt by saving your entries.

Continued on next page

2. Put away the bases using a transfer order in your warehouse number **1xx**. When you confirm the transfer order, you report a difference of one piece.
 - a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Create Transfer Order → For Material.*
 - b) Enter your warehouse number **1xx**, material **LES02-##**, and choose *Enter*.
 - c) Choose *TO Backgrnd* to create the transfer order in the background.
 - d) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Confirm Transfer Order → Single Document → In One Step.*

Choose foreground processing.

 - e) In the *Dest.Dif.Quantity* field (difference quantity destination bin), enter the shortfall quantity and confirm this entry by choosing *Enter*. The system corrects the actual quantity automatically.
 - f) Save your input. To confirm the message concerning the difference, choose *Confirm Difference*.
3. Check the stocks of material **LES02-##** in your warehouse number **1xx**.
 - a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management).*
 - b) Enter your warehouse number **1xx**, material **LES02-##**, and choose *Enter*.
 - c) For the shortfall quantity, the system has generated a quant for one piece of the material in the interim storage area **999 (Differences)**.

Continued on next page

4. Clear the difference in Inventory Management, and check the results in the stock overview for your warehouse number.



Hint: You must clear the difference that occurred during putaway in the same way that you would clear inventory differences.

- a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Physical Inventory → In Warehouse Management → Clear Differences → Inventory Management*.
- b) Enter your warehouse number **1xx** and the interim storage area **999**. To execute the selection, choose *Execute* : The system displays the quant to be cleared.
- c) Choose *Clear* to clear the shortfall quantity from your storage location, **01xx**. The system informs you that a material document was created by the posting.
- d) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.
- e) Enter your warehouse number **1xx**, material **LES02-##**, and choose *Enter*. The difference is cleared.



Lesson Summary

You should now be able to:

- Explain the function of transfer orders
- Create a transfer order with reference to a transfer requirement
- Confirm a transfer order
- Track the putaway process in the stock overview

Lesson: Inbound Deliveries for Purchase Orders

Lesson Overview

As of SAP R/3 4.5A, **inbound deliveries** are available as a document. In Logistics Execution, this document is used to map goods receipt processes where the putaway for materials procured externally must take place before the goods receipt is posted in Inventory Management.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the flow of the goods receipt process using inbound deliveries
- Explain the function of inbound deliveries
- Create an inbound delivery for a purchase order
- Call up and interpret the data relevant for putaway in the inbound delivery document

Business Example

IDES AG is investigating an alternative to the previous goods receipt process for externally procured materials. The incoming goods should be put away before the goods receipt is posted in Inventory Management.

Goods Receipt with Inbound Deliveries: Process Flow

The goods receipt process using inbound deliveries realistically maps standard processes in many companies. If the vendor announces the goods receipt with a **shipping notification**, the inbound delivery can be created either manually or automatically on the basis of the shipping notification. It contains information transmitted by the vendor concerning the expected delivery times and quantities, as well as any information about packaging. It is also the reference document for the subsequent putaway using a **transfer order**. If you also use the transportation function as part of Logistics Execution, you can summarize inbound deliveries into **inbound shipments**.

→ **Note:** Up to SAP R/3 4.5A, the term “shipping notification” was used in Materials Management to refer to both the message and the document. As of SAP R/3 4.5B, “shipping notification” now refers to the **message** and “inbound delivery” to the **document**.

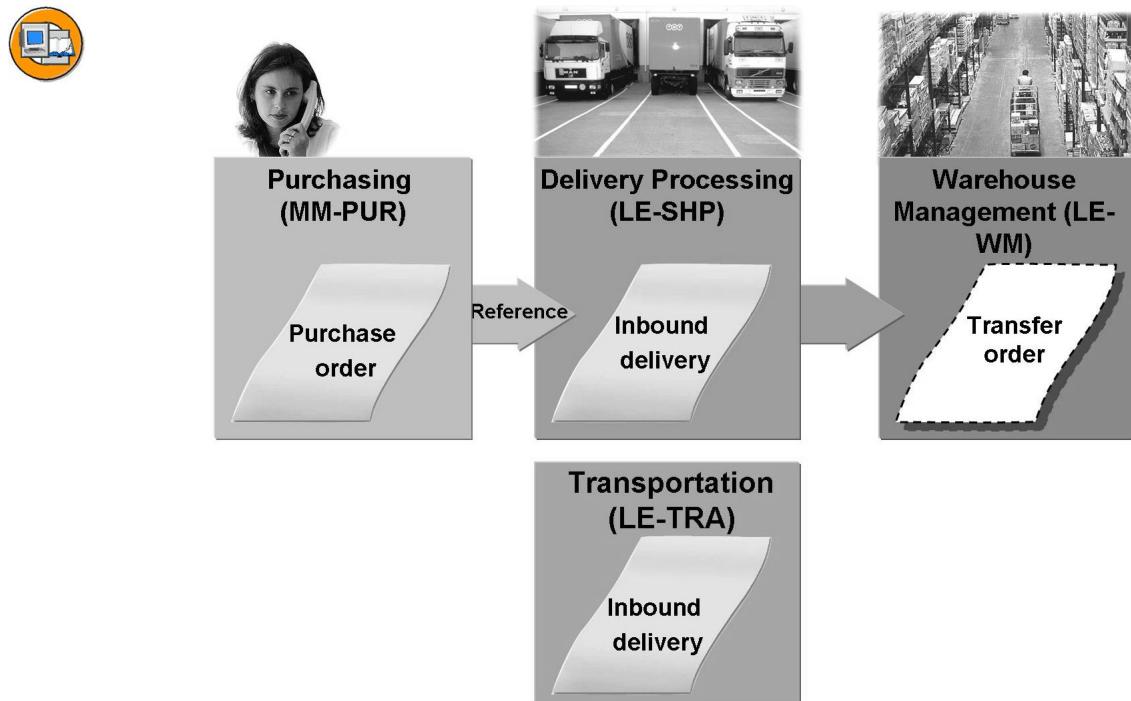


Figure 26: Goods Receipt Process with Inbound Deliveries: Process Flow

If you have an EDI connection to the vendor, the vendor's shipping notification can generate an inbound delivery. The purchasing document is always the reference document.

→ **Note:** SAP ECC uses the UN/EDIFACT message type DESADV to map these processes with Intermediate Documents (IDocs).

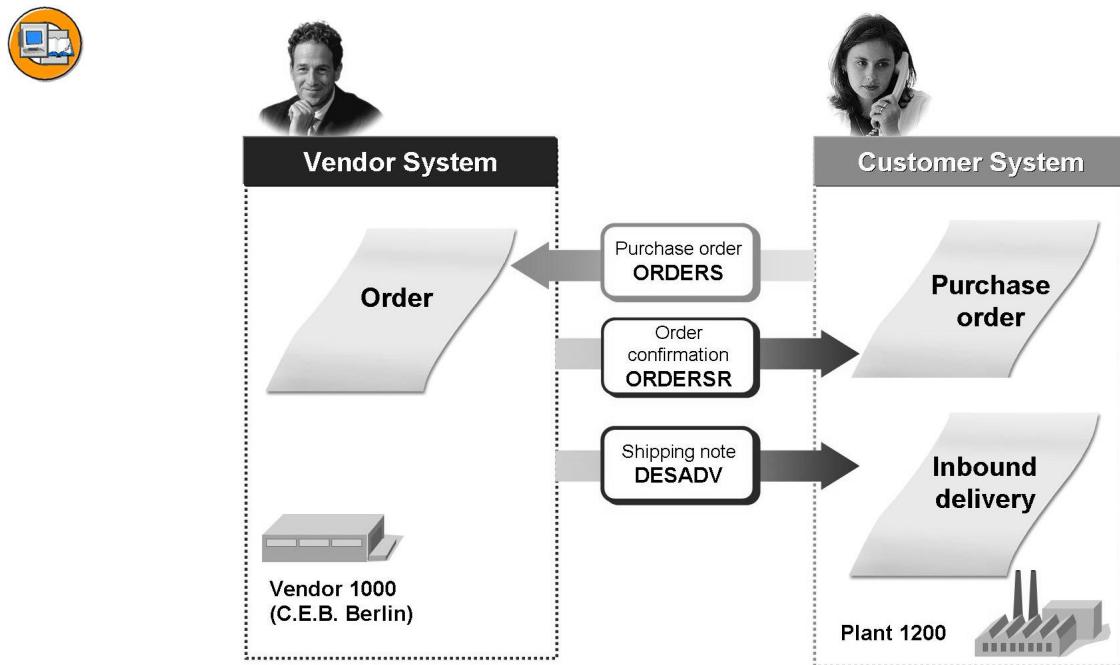


Figure 27: Creating an Inbound Delivery Using an EDI Connection

Confirmations

The decision on the further process flow is made in the purchasing document. If you want to work with inbound deliveries, this has to be defined for each item in the purchase order. A **confirmation control key** is used, which you define in Customizing for Purchasing. A confirmation control key in the purchase order specifies that the orderer is expecting a confirmation from the vendor for the selected item. This can be either an order confirmation or a shipping notification. The inbound delivery is also categorized as a type of order confirmation.

Customizing links the confirmation control key *Inbound Delivery* with the delivery type (**EL**) that was preconfigured for the document “inbound delivery”. If the confirmation control key *Inbound Delivery* is assigned to a purchase order item, this also means that you can no longer post a goods receipt with reference to the purchase order. You must post the goods receipt with reference to the inbound delivery. If you are using the Warehouse Management System, you usually perform a putaway with a transfer order before the goods receipt can be posted for the inbound delivery. Accordingly, you can only create an inbound delivery for purchase order items with the relevant confirmation control key.

→ **Note:** In the vendor master and/or purchasing information record, you can specify a default confirmation control key in the purchasing organization data. In Customizing for Shipping, you can also assign suitable default values for combinations of plant, storage type, purchasing document category, and purchase order category.

The Inbound Delivery

The document for the inbound delivery is essentially structured in the same way as the outbound delivery, that is, the SAP ECC document, which is the basis of shipping processing in the goods issue process. The inbound delivery also has a document header containing the data valid for the entire transaction (vendor, goods receiving point, delivery date) and document items for the included materials. For each of these items, the system attempts to determine the receiving plant and storage location from the purchase order. You can change the storage location manually before putaway, or add a storage location if it is missing in the purchase order. The system uses the storage location to decide whether the material is put away. If the receiving plant and storage location are assigned to one warehouse number in Customizing, the system displays this warehouse number as the target in the inbound delivery. Also, the system enters an overall status for the putaway and a status for the transfer order processing, which is updated in the course of the goods receipt process.

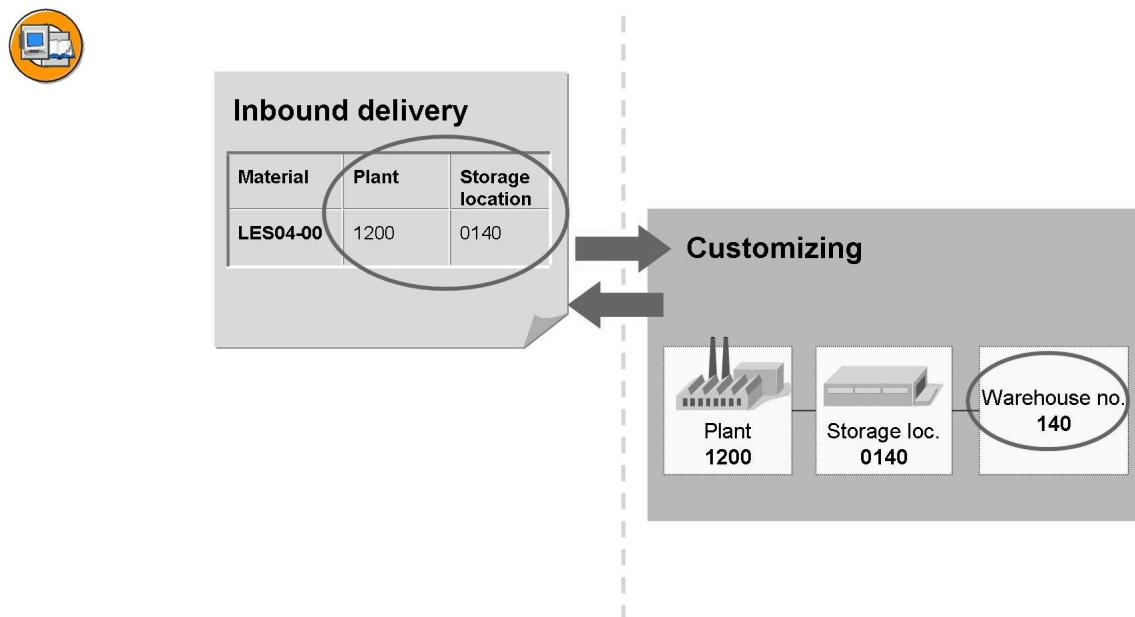


Figure 28: Determining Warehouse Numbers

In the inbound delivery, the system uses the warehouse management movement type for goods receipts for externally procured materials to determine the issuing storage type for each document item (in other words, the interim storage area goods receipt zone, and the issuing storage bin, which is usually a dynamic storage bin with the number of the purchase order as its bin coordinates).

→ **Note:** The system displays this data for each item on the *Putaway* tab page.

A main advantage of the goods receipt process using inbound deliveries, is that in Inventory Management and Sales and Distribution, you can only see those *unrestricted-use* receipts that have already been put away. The storage location stocks used in the availability check are only increased at the end of the process.

If you use **Handling Unit Management** (a system for managing packages in SAP ECC that can be implemented at any point in the logistics process), you must map the goods receipts process with inbound deliveries, since only the inbound delivery allows packing or packages to be accepted from the vendor. The same applies if you use the **decentralized Warehouse Management System**. The central Enterprise Resource Planning system (ERP system) and the decentralized Warehouse Management System exchange process data exclusively via inbound and outbound deliveries. If, however, you want to use **Quality Management** (QM) in SAP ECC, you cannot process goods receipts with inbound deliveries, unless you are also using Handling Unit Management.

Exercise 9: Creating an Inbound Delivery for a Purchase Order

Exercise Objectives

After completing this exercise, you will be able to:

- Create an inbound delivery for a purchase order

Business Example

You order 48 bases for flat screen monitors from vendor C.E.B. Berlin. The vendor informs you of an expected delivery date.

Task:

Create a purchase order for 48 bases for flat screen monitors, and specify in the purchase order that you want to create an inbound delivery for this purchase order.

1. Order 48 pieces of material **LES04-##** from vendor **1000** for plant **1200** and storage location **01xx**. Enter a delivery date of your choice.

Enter the following data at header level:

Vendor	1000
Purchasing Org.	1000
Purch. Group	000
Company Code	1000

2. In your purchase order, specify that further processing will use an inbound delivery.



Hint: There is a **confirmation control key ANLI** (*Inbound Delivery ECC*) on the *Confirmations* tab page at item level.

3. Call up the transaction for creating an inbound delivery for a purchase order (VL31N). On the initial *Create Inbound Delivery* screen, enter the delivery date from the vendor (such as the delivery date you entered in the purchase order).

Continued on next page

4. Go to the *Stock Placement* tab page.



Hint: If, when you save, the system issues a warning message *Acknowledgement for PO item x contains date variance*. Confirm the message by choosing *Enter*.

5. Check whether the system has updated the creation of the inbound delivery in the purchase order.

Solution 9: Creating an Inbound Delivery for a Purchase Order

Task:

Create a purchase order for 48 bases for flat screen monitors, and specify in the purchase order that you want to create an inbound delivery for this purchase order.

1. Order 48 pieces of material **LES04-##** from vendor **1000** for plant **1200** and storage location **01xx**. Enter a delivery date of your choice.

Enter the following data at header level:

Vendor	1000
Purchasing Org.	1000
Purch. Group	000
Company Code	1000

- a) Choose *Logistics → Materials Management → Purchasing → Purchase Order → Create → Vendor/Supplying Plant Known*.

Enter the following data at header level:

Vendor	1000
Purchasing organization	1000
Purchasing group	000
Company code	1000

Confirm your entries by choosing *Enter*.

- b) Enter material **LES04-##**, the required quantity (**48** pieces), the plant **1200**, and the storage location **01xx**. Confirm your entries with *Enter*.
2. In your purchase order, specify that further processing will use an inbound delivery.



Hint: There is a **confirmation control key ANLI (Inbound Delivery ECC)** on the *Confirmations* tab page at item level.

- a) At item level, select the *Confirmations* tab page and assign the confirmation control key *Inbound Delivery* to the item.
- b) Choose *Save* to create the purchase order.

Continued on next page

3. Call up the transaction for creating an inbound delivery for a purchase order (VL31N). On the initial *Create Inbound Delivery* screen, enter the delivery date from the vendor (such as the delivery date you entered in the purchase order).
 - a) Choose *Logistics* → *Logistics Execution* → *Inbound Process* → *Goods Receipt for Inbound Delivery* → *Inbound Delivery* → *Create* → *Single Documents*.
 - b) If necessary, enter the number of your purchase order and the delivery date. Choose *Enter*. The overview screen for the inbound delivery appears.
4. Go to the *Stock Placement* tab page.



Hint: If, when you save, the system issues a warning message *Acknowledgement for PO item x contains date variance*. Confirm the message by choosing *Enter*.

- a) Choose the *Stock Placement* tab page.
 - b) If the *Warehouse Number* field is empty, check the storage location in your delivery item. If necessary, manually enter your storage location **01##**.
- Hint:** The storage location for the item is copied from the purchase order. If you do not enter a storage location, you must enter it later in the inbound delivery.

 - c) Create the inbound delivery by saving your data. The initial screen appears and the system shows a document number in the status line.
5. Check whether the system has updated the creation of the inbound delivery in the purchase order.
 - a) Call your purchase order in display mode. Choose *Logistics* → *Materials Management* → *Purchasing* → *Purchase Order* → *Display*.
 - b) At item level, go to the *Confirmations* tab page. The document number and notified delivery date are shown in a list.



Lesson Summary

You should now be able to:

- Describe the flow of the goods receipt process using inbound deliveries
- Explain the function of inbound deliveries
- Create an inbound delivery for a purchase order
- Call up and interpret the data relevant for putaway in the inbound delivery document

Lesson: Putaway and Goods Receipt Posting

Lesson Overview

This lesson explains the technical posting process for putaway with reference to the inbound delivery.



Lesson Objectives

After completing this lesson, you will be able to:

- Create and confirm a transfer order for an inbound delivery
- Use the inbound delivery monitor
- Post the goods receipt for an inbound delivery
- Trace the putaway steps in the stock overview

Business Example

Vendor C.E.B. Berlin has delivered bases for flat screen monitors, as per a purchase order. The goods are brought from the goods receipt zone into the warehouse itself. Afterwards, the goods receipt is posted in the Inventory Management system.

Putaway Process for Inbound Deliveries

A transfer order is required to put away the delivered goods. This refers to the inbound delivery, and adopts essential data from the delivery for further processing (such as the issuing storage type and issuing storage bin). When you create the transfer order, the system uses master data and Customizing settings to determine storage types, storage sections, and storage bins for putaway. The goods receipt posting in Inventory Management, which also refers to the inbound delivery, completes the process.

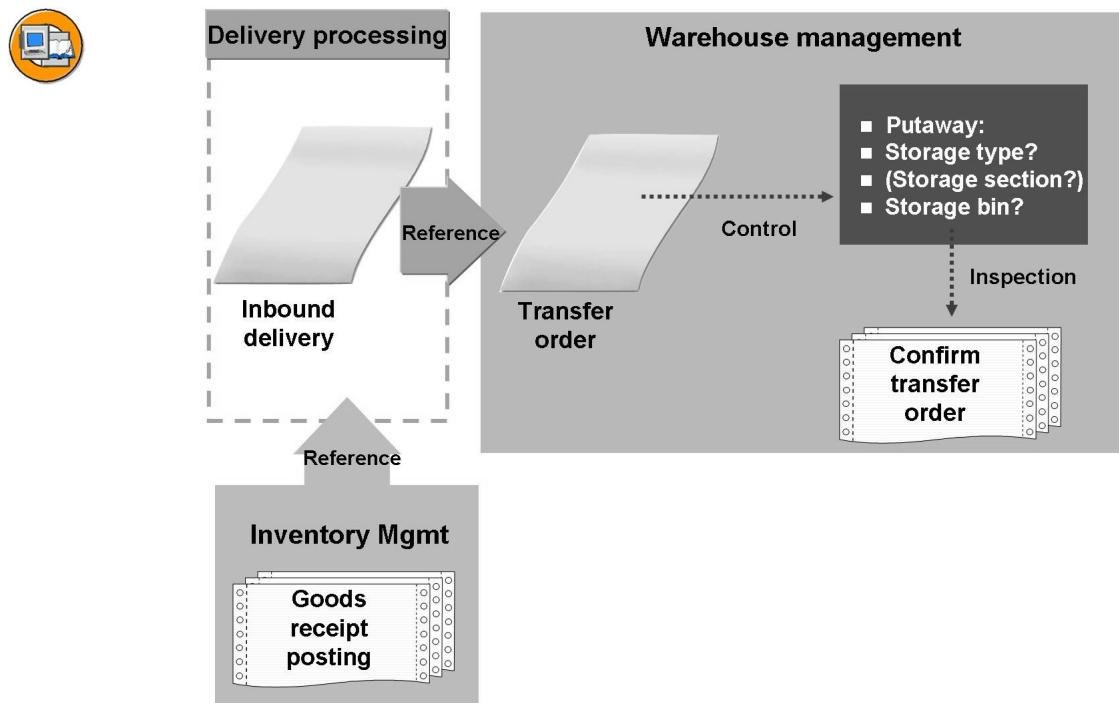


Figure 29: Putaway Process for Inbound Deliveries

Mapping the Putaway Operation

In the inbound delivery, the system determines a putaway storage location for each delivery item from either the purchase order or the Customizing settings. If the plant and storage location are linked to a warehouse number in Customizing, the system displays this warehouse number in the inbound delivery. The relevance for Warehouse Management is flagged with an overall putaway status and a transfer order status. This status shows you the progress of the putaway. In the transfer order for the putaway, the system copies palletization data - where present - from the material master.

When you create a transfer order for an inbound delivery, this causes the system to update at least one of the **negative quants** in the **interim storage area** goods receipt zone.

→ **Note:** The delivery items and quantities define the number of quants in the goods receipt zone. For example, if more than one material was delivered, the system generates at least one quant for each material. If individual materials are subject to batch management, the system generates at least one quant for each batch.



Figure 30: Negative Quant

This negative quant is a constructed object that ensures that at each point in the process, the stocks in Warehouse Management and Inventory Management **have the same total**. In the example, the transfer order for putaway refers to an inbound delivery for 24 pieces of a material. The putaway itself takes place before the transaction is posted in Inventory Management. This means that temporarily, 144 pieces of the material already exist in the warehouse. However, Inventory Management shows only 120 pieces in the stock overview. The quantity of the negative quant in the goods receipt zone (-24 pieces) is subtracted from the total stock in the warehouse number, so that the stock overview in Warehouse Management also shows a total of 120 pieces of the material.

The goods receipt posting always refers to the inbound delivery. You can only post the goods receipt once the putaway is complete for all items. Both delivery statuses must be set to **C**.

- **Note:** When you put away partial quantities, it results in the overall status **B**. If the transfer order for putaway has not yet been confirmed, the transfer order status is **B**.

The goods receipt posting increases the storage location stocks. The negative quant in the interim storage area has therefore served its purpose, and is cleared by the stock increase. Only now can the user see the putaway received goods in Sales and Distribution.

- **Note:** You report differences that arise or are noticed at putaway when you confirm the transfer order. The shortfall quantity is posted through the interim storage area assigned in Customizing.

As of SAP R/3 Enterprise, you can post a **partial goods receipt** for an inbound delivery. If several transfer orders are required to put away the total delivered quantity, you can post the partial quantity with reference to the inbound delivery

after you have posted **one** transfer order for the goods receipt. The same applies if the transfer order contains several items, and putaway is only confirmed for some of the items.

Exercise 10: Putaway for Inbound Deliveries Using Transfer Orders

Exercise Objectives

After completing this exercise, you will be able to:

- Create a transfer order and post the goods receipt for an inbound delivery

Business Example

Vendor C.E.B. Berlin has delivered 48 bases for flat screen monitors. The goods should be brought from the goods receipt zone into the warehouse itself. After putaway is complete, the goods receipt should be posted in Inventory Management.

Task:

Create the transfer order for the inbound delivery. Put away the delivered goods and post the goods receipt for the inbound delivery.

1. Check the stocks of material **LES04-##** in your warehouse number **1xx** and your storage location **01xx**.
2. Find the inbound delivery for your material **LES04-##**. Use the inbound delivery monitor (transaction VL06I).



Hint: Select using your warehouse number **1xx**.

3. Display your inbound delivery and check the two putaway statuses.
4. From the monitor, create a transfer order in the foreground.
5. Check the stock overview again.
6. Confirm your transfer order in the background.
7. After confirmation, check your stocks.
8. Post the goods receipt for your inbound delivery. Before you do this, look at the status update. Both delivery statuses should now be set to **C**.
9. Check the stocks again for your warehouse number and your storage location.

Solution 10: Putaway for Inbound Deliveries Using Transfer Orders

Task:

Create the transfer order for the inbound delivery. Put away the delivered goods and post the goods receipt for the inbound delivery.

1. Check the stocks of material **LES04-##** in your warehouse number **1xx** and your storage location **01xx**.
 - a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.
 - b) Enter your warehouse number **1xx** and the material number **LES04-##**, and confirm with *Enter*. There are currently 120 pieces of material in the shelf storage area (storage type**002**).
 - c) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Inventory Management)*.
 - d) Enter material number **LES04-##** and choose *Execute* .



Hint: Leave the remaining fields empty.

Continued on next page

2. Find the inbound delivery for your material **LES04-##**. Use the inbound delivery monitor (transaction VL06I).



Hint: Select using your warehouse number **1xx**.

- a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Inbound Delivery → Inbound Delivery → Lists → Inbound Delivery Monitor*.
- b) Choose *For Putaway*.



Hint: The putaway is the next step for processing your inbound delivery. You can choose to search for your document using the *Delivery List for Inbound Deliveries*. The advantage of the procedure in b), is that you can create a transfer order directly from the document list.

- c) Select your inbound delivery using your warehouse number, **1xx**. To perform the search, choose *Execute* . The document number of your inbound delivery appears in the list of *Inbound Deliveries for Putaway*.
3. Display your inbound delivery and check the two putaway statuses.
 - a) Select your inbound delivery and choose *Subsequent Functions → Display Inbound Deliveries*.
 - b) Choose the *Stock Placement* tab page. The *Overall Putaway Status* and the *Overall Status WM* are set to **A**. The putaway must occur before the goods receipt can be posted in the inventory management.
 - c) Go back to the inbound delivery monitor by choosing *Back*.

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4. From the monitor, create a transfer order in the foreground.
 - a) Select your inbound delivery and choose *TO in Foregr.*
 - b) Check the data on the initial screen of transaction. Are the warehouse number and document number correct? If they are correct, confirm with *Enter*.

 **Hint:** The *System-Guided* option takes you to foreground processing of the transfer order.

 - c) Check the palletization for the total quantity and choose *Putaway Background* .
 - d) Confirm the default values with *Enter* and create the transfer order by saving.
5. Check the stock overview again.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Warehouse Management)*.
 - b) The 48 pieces of material to put away are shown as both stock to put away into the shelf storage area, and as stock to remove from storage in the goods receipt zone. There is also remaining negative stock in the goods receipt zone.
6. Confirm your transfer order in the background.
 - a) Choose *Logistics* → *Logistics Execution* → *Inbound Process* → *Goods Receipt for Inbound Delivery* → *Putaway* → *Confirm Transfer Order* → *Single Document* → *In One Step*.
 - b) In the *Control* block, choose the *Background* processing option and confirm your selection by choosing *Enter*. The system confirms the transfer order in the background.
7. After confirmation, check your stocks.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Warehouse Management)* or *Refresh*  if you opened the stock overview in another session.
 - b) You have now put away the delivered material. Because the goods receipt has not yet been posted in Inventory Management, the negative quant remains in the goods receipt zone.

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8. Post the goods receipt for your inbound delivery. Before you do this, look at the status update. Both delivery statuses should now be set to C.
 - a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Inbound Delivery → Post Goods Receipt → Inbound Delivery Individual Document.*
 - b) If the system does not propose your inbound delivery, enter the document number in the *Inbound Delivery* field, and confirm with *Enter*.
 - c) On the overview screen, choose the *Stock Placement* tab page and check the status values.
 - d) To post the goods receipt, choose *Post Goods Receipt*.
9. Check the stocks again for your warehouse number and your storage location.
 - a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)* or Refresh 
 - b) Then choose *MM stock figures* to display the storage location stocks.

Exercise 11: Partial Putaway with Subsequent Goods Receipt Posting (Optional)

Exercise Objectives

After completing this exercise, you will be able to:

- Process a partial putaway with a subsequent goods receipt posting for the inbound delivery

Business Example

It is not always possible to put away the entire delivered quantity immediately. However, the partial quantity should be available as soon after putaway as possible.

Task:

Create a purchase order, enter an inbound delivery for the order, and put away only a partial quantity. The system should post the goods receipt for this partial quantity as soon as the transfer order is confirmed.

- As in the first exercise, create a purchase order from vendor C.E.B. Berlin for 120 pieces of material **LES04-##** for plant **1200** and storage location **01xx**. In the purchase order, indicate that you want to continue processing using an inbound delivery. Make a note of the document number: _____

Input values:

Vendor	1000
Purchasing organization	1000
Purchasing group	000
Company code	1000

- Create an inbound delivery for your purchase order, and check the putaway status. Make a note of the document number: _____
- Create two transfer orders for the inbound delivery by dividing up the total quantity to put away. For the first transfer order, choose foreground processing.

Continued on next page

4. Confirm the first transfer order in the background. Before you do this, specify that the partial quantity goods receipt should be posted directly after the confirmation.



Hint: Select option 4 (*Do not take putaway qty as delivery qty, but post GR*) as the value for the *Adopt Putaway Quantity* field.

5. Finally, check the document flow for your inbound delivery. Was the goods receipt for the partial quantity posted?
6. Confirm the second transfer order in the background. As for the first transfer order, specify that the goods receipt should be posted directly after confirmation.

Solution 11: Partial Putaway with Subsequent Goods Receipt Posting (Optional)

Task:

Create a purchase order, enter an inbound delivery for the order, and put away only a partial quantity. The system should post the goods receipt for this partial quantity as soon as the transfer order is confirmed.

1. As in the first exercise, create a purchase order from vendor C.E.B. Berlin for 120 pieces of material **LES04-##** for plant **1200** and storage location **01xx**. In the purchase order, indicate that you want to continue processing using an inbound delivery. Make a note of the document number: _____

Input values:

Vendor	1000
Purchasing organization	1000
Purchasing group	000
Company code	1000

- a) Choose *Logistics → Materials Management → Purchasing → Purchase Order → Create → Vendor/Supplying Plant Known*.
- b) At header level, enter the data listed in the table. At item level, add the material **LES04-##**, the quantity **120**, the plant **1200** and storage location **01xx**.
- c) At item level, select the *Confirmations* tab page and the confirmation control key *Inbound Delivery*. Choose *Save* to create the purchase order.
2. Create an inbound delivery for your purchase order, and check the putaway status. Make a note of the document number: _____
 - a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Inbound Delivery → Inbound Delivery → Create → Single Documents*.
 - b) If it is not already entered as a default value, enter the document number of your purchase order from the first task and choose *Enter*.
 - c) On the *Stock Placement* tab page, you can see the transfer order status **A** and your (target) warehouse number, **1xx**.
 - d) Create the inbound delivery by saving.

Continued on next page

3. Create two transfer orders for the inbound delivery by dividing up the total quantity to put away. For the first transfer order, choose foreground processing.
 - a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Inbound Delivery → Putaway → Create Transfer Order → For Inbound Delivery.*
 - b) Enter your warehouse number **1xx** and the document number of your inbound delivery from step 2 and choose *Enter*.
 - c) Reduce the number of storage units (SU) from five to three and choose *Edit → Putaway → Background*. Save your entries. Confirm the query *Requested quantity x% fulfilled - Created items sufficient?* by choosing *Yes*. Save your entries to create the transfer order.
 - d) Create the second transfer order using the remaining quantity in background processing by repeating step b), but first select the indicator *Background* in the field *Foreground/Backgrnd*.
4. Confirm the first transfer order in the background. Before you do this, specify that the partial quantity goods receipt should be posted directly after the confirmation.



Hint: Select option **4 (Do not take putaway qty as delivery qty, but post GR)** as the value for the *Adopt Putaway Quantity* field.

- a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Inbound Delivery → Putaway → Confirm Transfer Order → Single Document → In One Step*.
 - b) In the *Adopt Putaway Quantity* field in the initial screen, choose option **4**, and in the *Foreground/Backgrnd* field, set the *Background* indicator. Choose *Enter* to confirm your entries.
5. Finally, check the document flow for your inbound delivery. Was the goods receipt for the partial quantity posted?
 - a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Inbound Delivery → Inbound Delivery → Display → Single Documents*.
 - b) From the menu, choose *Environment → Document Flow*. The goods receipt posting for the quantity put away in the last step is shown in the document flow. The second transfer order has the overall processing status *Open*.

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6. Confirm the second transfer order in the background. As for the first transfer order, specify that the goods receipt should be posted directly after confirmation.
 - a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Inbound Delivery → Putaway → Confirm Transfer Order → Single Document → In One Step.*
 - b) In the *Foreground/Backgrnd* field, set the *Background* indicator, and in the *Adopt Putaway Quantity* field choose option 4. To confirm the transfer order, choose *Enter*.



Lesson Summary

You should now be able to:

- Create and confirm a transfer order for an inbound delivery
- Use the inbound delivery monitor
- Post the goods receipt for an inbound delivery
- Trace the putaway steps in the stock overview



Unit Summary

You should now be able to:

- Explain the technical posting process of a goods receipt for a purchase order, with subsequent putaway
- Create a purchase order in Purchasing
- Post a goods receipt for this purchase order in Inventory Management
- Display the transfer requirement generated by the goods receipt posting, and interpret its contents
- Explain the function of transfer orders
- Create a transfer order with reference to a transfer requirement
- Confirm a transfer order
- Track the putaway process in the stock overview
- Describe the flow of the goods receipt process using inbound deliveries
- Explain the function of inbound deliveries
- Create an inbound delivery for a purchase order
- Call up and interpret the data relevant for putaway in the inbound delivery document
- Create and confirm a transfer order for an inbound delivery
- Use the inbound delivery monitor
- Post the goods receipt for an inbound delivery
- Trace the putaway steps in the stock overview



Test Your Knowledge

1. *Available Stock* in the Warehouse Management stock overview means:
Choose the correct answer(s).
 - A “Available” in the context of the availability check
 - B “Unrestricted-use” in the sense of the Inventory Management stock overview
 - C “Not being moved in the warehouse”
 - D “Can be removed from stock” as long as the storage bin has not been blocked
2. What is a “dynamic” storage bin?

3. Which storage types can contain dynamic storage bins?

4. How does the system determine a storage bin for putaway?

5. In transfer order creation, what do the terms “direct” and “automatic” mean?

Direct:	
Automatic:	

6. If you have assigned the confirmation control key *Inbound Delivery* to a purchase order item, you cannot post a goods receipt for the purchase order.
Determine whether this statement is true or false.
 - True
 - False

7. At which points in the system can you define a confirmation control key as a default value for the purchase order?

8. At what point in the putaway process is a negative quant generated in the interim storage area goods receipt zone?

9. In SAP R/3 Enterprise, you can post a goods receipt for the inbound delivery of a partial quantity after it has been putaway.

Determine whether this statement is true or false.

- True
- False



Answers

1. *Available Stock* in the Warehouse Management stock overview means:

Answer: C, D

Available Stock in the Warehouse Management stock overview means “not being moved in the warehouse.” *Available Stock* is contained in the storage bins, and can be removed from stock as long as the storage bin has not been blocked.

2. What is a “dynamic” storage bin?

Answer: A “dynamic” storage bin is a storage bin generated by the system for a specific transaction, and which only exists for the duration of the transaction.

3. Which storage types can contain dynamic storage bins?

Answer: Only interim storage areas can contain dynamic storage bins.

4. How does the system determine a storage bin for putaway?

Answer: It first determines the **target storage type**. If you have set, in Customizing for storage types, that the system should check the **storage section** at putaway, the next step is that the system searches for a storage section. The system then performs **storage bin** determination in this storage section, according to the putaway strategy of the destination storage type.

5. In transfer order creation, what do the terms “direct” and “automatic” mean?

Direct:	
Automatic:	

In **direct** transfer order creation, the document is created directly after the previous posting. In comparison, **automatic** transfer order creation uses a report (RLAUTA10). The documents are therefore created with a time delay.

6. If you have assigned the confirmation control key *Inbound Delivery* to a purchase order item, you cannot post a goods receipt for the purchase order.

Answer: True

If you have assigned the confirmation control key *Inbound Delivery* to a purchase order item, you cannot post a goods receipt for the purchase order.

7. At which points in the system can you define a confirmation control key as a default value for the purchase order?

Answer: You can store the confirmation control key as a default value in the purchasing information record, and in Customizing for the delivery.

8. At what point in the putaway process is a negative quant generated in the interim storage area goods receipt zone?

Answer: The negative quant is generated when you create the transfer order for the inbound delivery.

9. In SAP R/3 Enterprise, you can post a goods receipt for the inbound delivery of a partial quantity after it has been putaway.

Answer: True

This statement is correct. This is a new option that is available in SAP R/3 Enterprise.

Unit 4

Goods Issue Processes

Unit Overview

The goods issue process also has two basic forms in Logistics Execution, which you will learn about in this unit:

- Goods issue posting (for example, for a work order or a cost center) and subsequent stock removal
- Outbound delivery for sales order, stock removal for outbound delivery, and subsequent goods issue posting for the outbound delivery

You will also receive an overview of transportation control as a subfunction of Logistics Execution.



Unit Objectives

After completing this unit, you will be able to:

- Explain the technical posting process of a goods issue for a cost center with subsequent stock removal
- Post a goods issue for a cost center in Inventory Management
- Display the transfer requirement generated by the goods issue posting
- Interpret the stock overview
- Create a transfer order for a transfer requirement
- Confirm the transfer order
- Track the stock removal in the stock overview
- Describe the goods issue process with outbound deliveries
- Create a sales order
- Check the scheduling of the shipping process
- Create an outbound delivery for a sales order
- Call up and interpret document data that is relevant for the stock removal
- Create and confirm a transfer order for an outbound delivery
- Post the goods issue for an outbound delivery
- Use the outbound delivery monitor

- Name the options available for collective processing and automated processing
- Name the range of functions within transportation planning
- Explain the fundamental control parameters for the shipment type
- Create a shipment document
- Use this document to map transportation processing in SAP ECC

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Lesson: Goods Issue Posting for Cost Centers

Lesson Overview

This lesson deals with how to post a goods issue for a cost center from a warehouse-managed storage location, in order to determine the effects of this kind of withdrawal posting in Warehouse Management.



Lesson Objectives

After completing this lesson, you will be able to:

- Explain the technical posting process of a goods issue for a cost center with subsequent stock removal
- Post a goods issue for a cost center in Inventory Management
- Display the transfer requirement generated by the goods issue posting
- Interpret the stock overview

Business Example

For test purposes, the “Research and Development” department needs a few pieces of a material that has been put away. In Inventory Management, a goods issue is posted to the department's cost center.

Withdrawal for Cost Center: Process Flow

When withdrawing warehouse materials to be debited to a cost center, the goods issue in Inventory Management is the start of the process. If the issuing storage location is linked to a warehouse number in Customizing, a **transfer requirement** is generated for the material quantity to be withdrawn, in addition to the material and accounting document(s). At the same time, this quantity is mapped as a **negative quant** in the **interim storage area** goods issue zone.

→ **Note:** Standard SAP ECC systems contain a preconfigured “goods issue area for cost center” with the storage key type **911**.

The material is removed from storage using a **transfer order**, which refers to and adopts the destination data from the transfer requirement (receiving storage type and storage bin). Confirmation of the transfer order completes the goods issue process. The material is now available for the department that requested it.

→ **Note:** Depending on your Customizing settings, you can skip confirmation of the transfer order. This requirement for confirmation is dependent on the storage type.

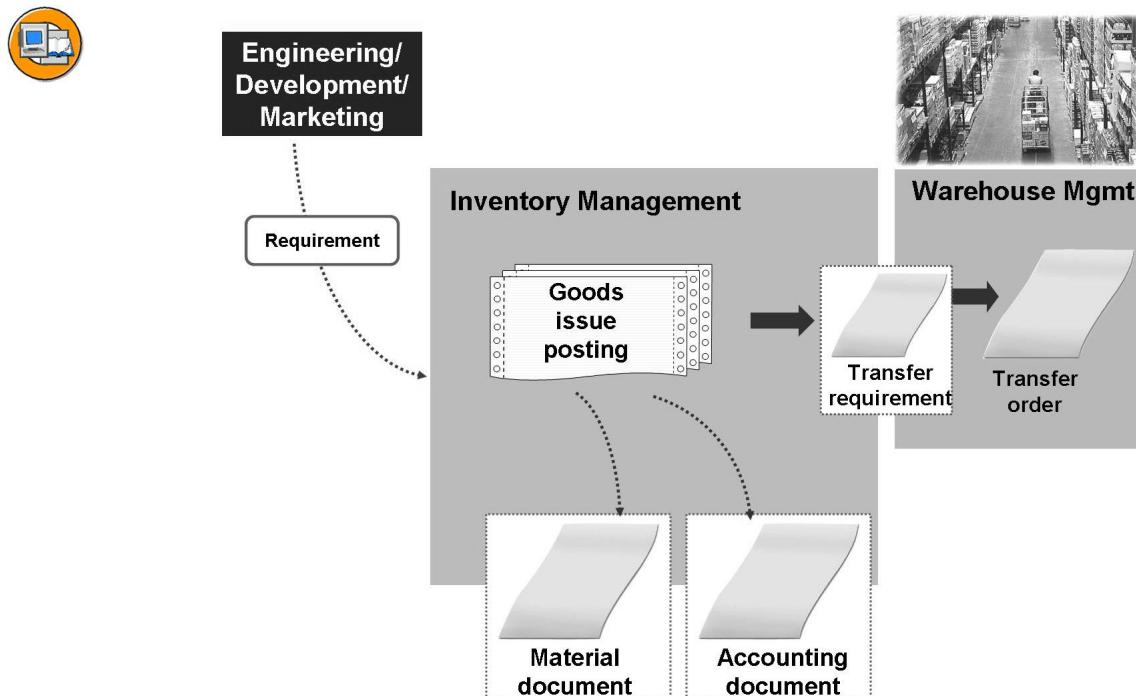


Figure 31: Withdrawal for Cost Center: Process Flow

Negative Quants in the Goods Issue Area

A goods issue posting in Inventory Management reduces the **storage location stock** of the material involved. However, the stock in the assigned **warehouse number** remains unchanged until the stock removal is complete. To display the same total material quantities in both Inventory Management and Warehouse Management, the system generates a negative interim storage area stock when the goods issue is posted. This is then subtracted from the warehouse number total stock during the stock removal operation for the material to remove from storage.

Note: This procedure is comparable to the goods receipt process with inbound deliveries. Here, the system uses negative interim storage type stocks to note the fact that quantities have been received in the warehouse number that have not yet been posted at storage location level. The subsequent goods receipt posting for the inbound delivery balances the negative stock.

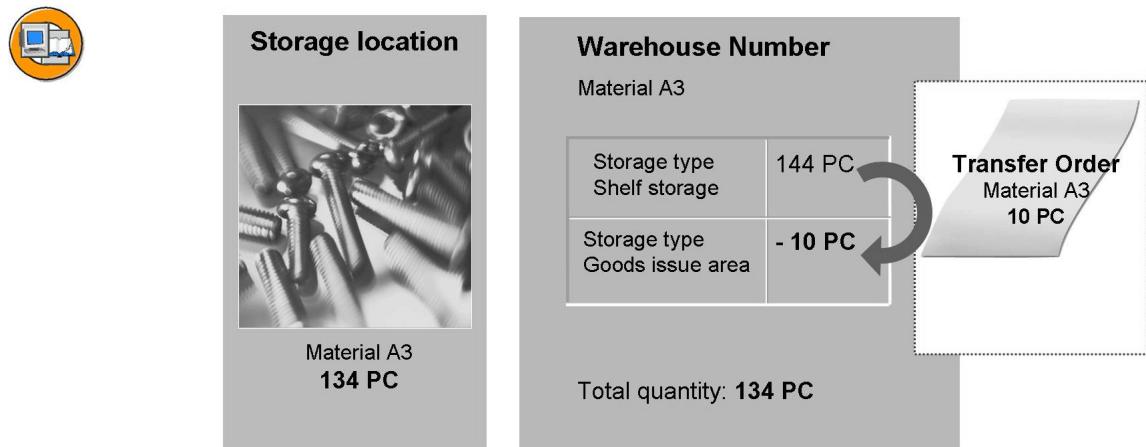


Figure 32: Negative Quant

The “putaway” of the requested quantity into the *Goods Issue Area* interim storage area balances the positive and negative quants. Stock removal is complete.

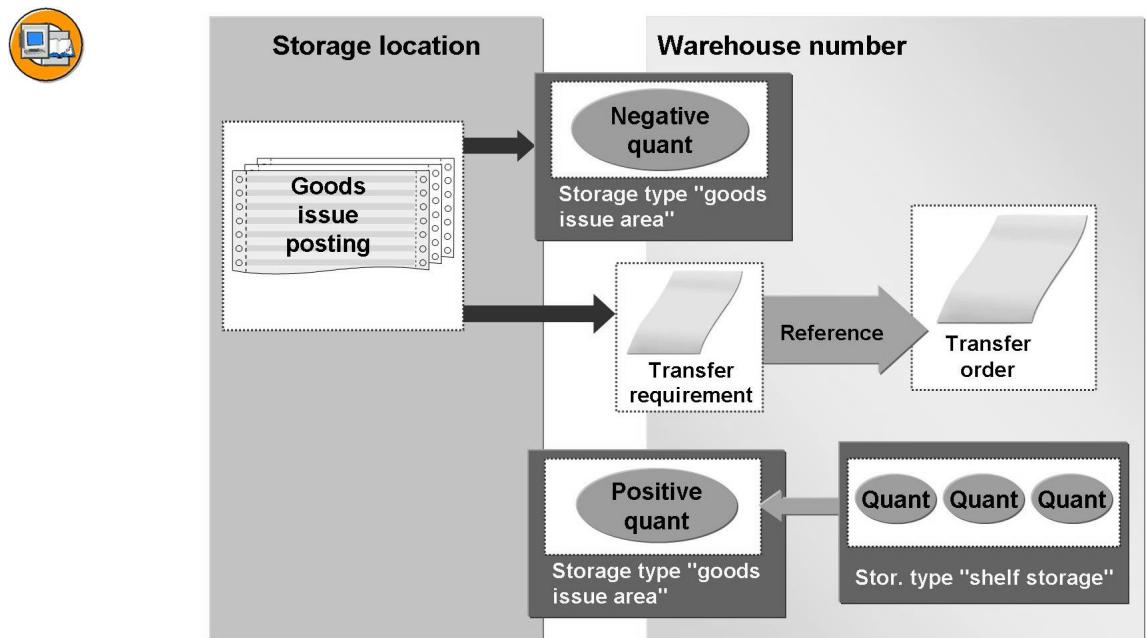


Figure 33: Stock Removal After Withdrawal Posting

A material withdrawal for a work order for production is mapped in the same way, as long as you are not using the **WM-PP interface**. This means that a goods issue is posted for the work order in Inventory Management (in the standard system, with movement type **261**). This posting generates negative quants in the goods

issue area for work orders (in the standard system, interim storage area **914**), and a transfer requirement for all components requiring removal from storage as defined in the order. Confirmation of the transfer order also completes this process.

- **Note:** Using the preconfigured interface between Production Planning and Warehouse Management (WM-PP interface) allows you to perform staging targeted at specific storage bins, using **production supply areas** from shop floor control. Here, stock removal is controlled using **control cycles**. Control cycles are master data in Warehouse Management in which you define which material is staged, in which storage bin, and in which form.

Exercise 12: Withdrawals for Cost Centers

Exercise Objectives

After completing this exercise, you will be able to:

- Post a goods issue for a cost center, and explain the effects of this posting in Warehouse Management

Business Example

For test purposes, the “Research and Development” department needs a few pieces of a material that has been put away. In Inventory Management, a goods issue is posted to the department’s cost center.

Task:

Post a goods issue for the cost center. Check your stocks in Warehouse Management, and check the transfer requirement that the system generated for the subsequent stock removal.

- Display the stocks of your material **LES02-##** in warehouse number **1xx** and storage location **01xx**.
- Post the goods issue for cost center **1000** for 10 pieces of your material **LES02-##**. The material should be withdrawn from storage location **01xx**.



Hint: In the *Logistics Execution* area menu, you only have the option of transaction MB1A (*Enter Goods Issue*). If you want to use transaction MIGO, choose *Logistics → Materials Management → Inventory Management → Goods Movement → Goods Issue (MIGO)*.

- Check the stock overview for your material in both Warehouse Management and Inventory Management.
- Display the transfer requirement generated by the goods issue posting.

Solution 12: Withdrawals for Cost Centers

Task:

Post a goods issue for the cost center. Check your stocks in Warehouse Management, and check the transfer requirement that the system generated for the subsequent stock removal.

1. Display the stocks of your material **LES02-##** in warehouse number **1xx** and storage location **01xx**.
 - a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.
Enter your warehouse number **1xx** and the material number **LES02-##**, and confirm with *Enter*.
 - b) Go from this overview to Inventory Management by choosing *MM Stocks*.

Continued on next page

2. Post the goods issue for cost center **1000** for 10 pieces of your material **LES02-##**. The material should be withdrawn from storage location **01xx**.



Hint: In the *Logistics Execution* area menu, you only have the option of transaction MB1A (*Enter Goods Issue*). If you want to use transaction MIGO, choose *Logistics → Materials Management → Inventory Management → Goods Movement → Goods Issue (MIGO)*.

- a) Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions → Enter Goods Issue*.
- b) Input data:

Movement type	201
Plant	1200
Storage location	01xx
- c) Confirm your entries with *Enter*. On the following screen, enter *Cost Center 1000*, material number **LES02-##**, and in the *Quantity* field, enter the required number of pieces. Choose *Enter* to confirm your entries.
- d) Post the goods issue by saving your input. The system shows the material document number in the status line.
- e) If you use transaction MIGO, select the entry *Others* in the field to the right of *Goods Issue*. The system proposes the movement type **201 (GI for cost center)**.
- f) Enter your material number **LES02-##** at item level of the *Material* tab page. Select the *Quantity* tab page and enter the quantity **10**. On the *Where* tab page, add the plant **1200** and the storage location **01xx**. Finally, on the *Account Assignment* tab page, enter the cost center **1000**.
- g) Post the goods issue by saving your entries.

Continued on next page

3. Check the stock overview for your material in both Warehouse Management and Inventory Management.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Warehouse Management)*.
 - b) In the interim storage area **911** (*GI area cost center*) you can see a negative stock for the withdrawal quantity (10 pieces).
 - c) To check the storage location stocks, choose *MM Stocks*.
4. Display the transfer requirement generated by the goods issue posting.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Transfer Requirement* → *Display* → *For Material* and confirm your entries by choosing *Enter*.
 - b) If the system does not propose values, enter your warehouse number **1xx** and material number **LES02-##** and confirm with *Enter*. To display your transfer requirement, place the cursor on the document number and left-click.



Lesson Summary

You should now be able to:

- Explain the technical posting process of a goods issue for a cost center with subsequent stock removal
- Post a goods issue for a cost center in Inventory Management
- Display the transfer requirement generated by the goods issue posting
- Interpret the stock overview

Lesson: Stock Removal with Transfer Orders

Lesson Overview

A goods issue posting to a storage location that was assigned to a warehouse number in Customizing generates a transfer requirement. In this lesson, we will focus on stock removal using a transfer order that refers to this transfer requirement.



Lesson Objectives

After completing this lesson, you will be able to:

- Create a transfer order for a transfer requirement
- Confirm the transfer order
- Track the stock removal in the stock overview

Business Example

Material requested for test purposes is removed from storage in the shelf storage area, and is made available to the department that submitted the request.

Stock Removal with Transfer Orders: Process

The transfer order for removing the requested material from storage is created with reference to the transfer requirement. The goods issue posting for the cost center has also generated a negative stock in the **interim storage area** goods issue area. This ensures that both the storage location and the warehouse number always show the same material stock. The “putaway” of the requested material into the goods issue area balances the negative stock. The goods issue process is complete.

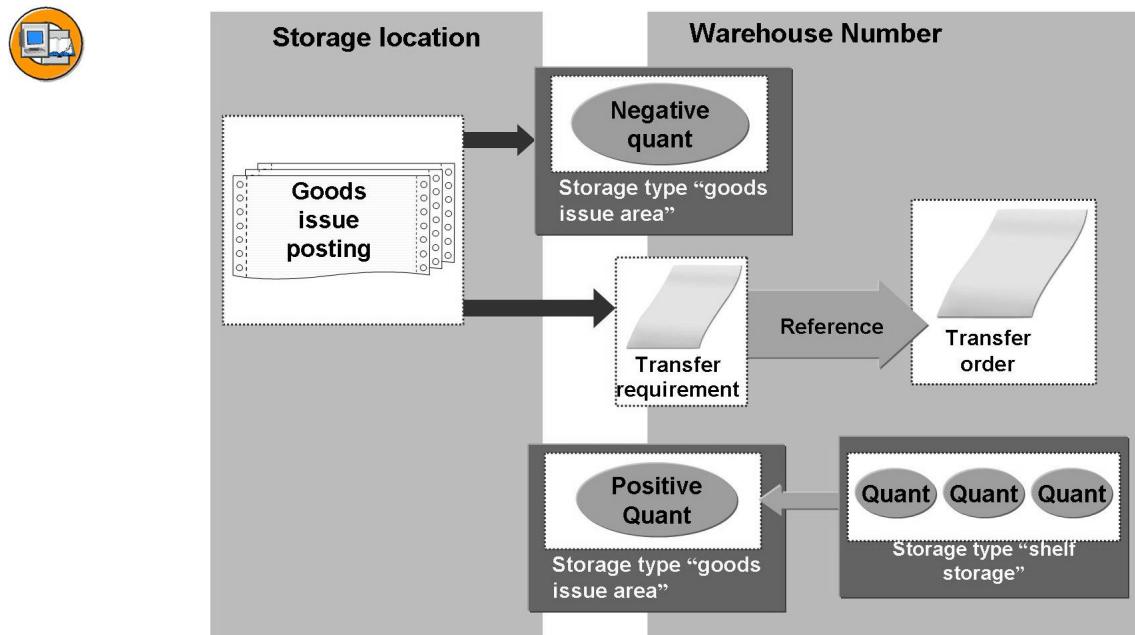


Figure 34: Stock Removal with Transfer Orders: Process

Transfer Order for Stock Removal

When you create a transfer order, the system checks master data and Customizing tables to find suitable storage bin stocks for removal from storage.

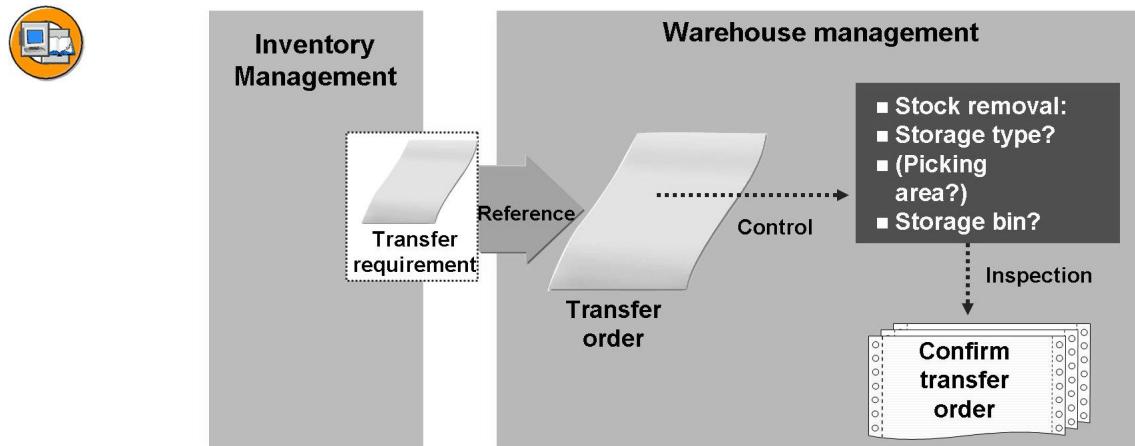


Figure 35: Transfer Order for Stock Removal

The system first looks for an **issuing storage type** (*source storage type*). In Customizing for Warehouse Management, you define a default storage type search sequence for stock removals for each warehouse number. The system works through all storage types in the sequence in which it should search for stock that can be removed from storage. You can use indicators to influence access to the

table that controls the search sequence. For example, you can use an indicator in the material master to define that a certain material (**storage type indicator**) is specifically removed from the shelf storage area.

→ **Note:** Both the stock type and whether the stock is special stock can define the storage type search. The prerequisite is that a corresponding entry is made in the table for the storage type search sequence.

In Customizing for the issuing storage type, the system finds the **stock removal strategy** that specifies how the **issuing storage bin** (*source storage bin*) should be determined in that storage type. The “first-in-first-out” (FIFO) strategy is often used, which means that the oldest quant is always removed from stock first. In the standard system however, there are other strategies available for storage bin determination.

→ **Note:** You can only assign one stock removal strategy to each storage type.

If there are **picking areas** in the issuing storage type, you can use these to optimize the stock removal.

- You print out a cross-transfer-order picking list that contains the material quantities to be removed from storage. These quantities are sorted by picking area.
- The transfer order is divided up according to picking areas (**transfer order split**). This means that more than one transfer order is created for each reference document.



Creating a Transfer Order for a Transfer Requirement

Prerequisites

A transfer requirement is usually generated as a result of an inventory management posting, such as a goods issue posting for a cost center.

Procedure

1. In one of the transfer requirement lists, find the transfer requirement for which you want to create a transfer order. You have a choice of transactions for selection by storage type, material, or requirement type.



Hint: The requirement type specifies the cause of the material movement, such as a withdrawal for a cost center (requirement type K).

Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Other Transactions* → *Picking* → *Create Transfer Order* → *For Storage Type/For Material/For Requirement*. Enter values for your selection and confirm with *Enter*.

2. If you want to display a transfer requirement shown in one of the lists, position the cursor on the document number and left-click.
3. To create a transfer order, select the relevant transfer requirement and choose either *TO in Foreground* or *TO in Background*.



Hint: In foreground processing, you create the transfer order interactively. You can therefore make changes. In background processing, the system generates the transfer order in the background, and displays the document number in the status line.

4. Confirm the transfer order. If you want to enter differences, you should choose foreground processing (choose *Foreground/Backgrnd* on the initial screen). Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Other Transactions* → *Picking* → *Confirm Transfer Order* → *Single Document* → *In One Step*.

Exercise 13: Stock Removal with Transfer Orders

Exercise Objectives

After completing this exercise, you will be able to:

- Create a transfer order for a transfer requirement in order to remove material from storage

Business Example

For test purposes, the “Research and Development” department requested a few pieces of a material that has been put away. In Inventory Management, the goods issue was posted to the department’s cost center. The material must now be removed from storage.

Task:

Use a transfer order to remove the requested material from storage.

1. Display the stock overview for material **LES02-##** in your warehouse number **1xx**.
2. Find the transfer requirement that was generated by the goods issue posting to the cost center. Use the transfer requirement list for your material **LES02-##**.
3. From the transfer requirement list, create a transfer order for your transfer requirement in the **foreground**. From which storage type does the system first attempt to remove the material from storage?
4. Call up the stock overview again for your material **LES02-##**.
5. Confirm the transfer order.
6. Check the stock overview again.

Solution 13: Stock Removal with Transfer Orders

Task:

Use a transfer order to remove the requested material from storage.

1. Display the stock overview for material **LES02-##** in your warehouse number **1xx**.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Warehouse Management)*.
Enter your warehouse number **1xx** and the material number **LES02-##**, and confirm with *Enter*.
 - b) In interim storage area **911** you can see a negative stock. This is the direct result of the goods issue posting to the cost center.
2. Find the transfer requirement that was generated by the goods issue posting to the cost center. Use the transfer requirement list for your material **LES02-##**.
 - a) Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Other Transactions* → *Picking* → *Create Transfer Order* → *For Material*.
 - b) If the system does not propose the required values, enter your warehouse number **1xx** and the material number **LES02-##**, and confirm with *Enter*.
 - c) If you want to look at the transfer requirement, position the cursor on the document number and left-click. Go back to the list of *Transfer Requirements for Material*.
3. From the transfer requirement list, create a transfer order for your transfer requirement in the **foreground**. From which storage type does the system first attempt to remove the material from storage?
 - a) Select your transfer requirement in the list and choose *TO in Foreground*.
 - b) In the *Storage Type Search* block, you can see a selection from the Customizing table for the storage type search sequence. The system will search first in storage type **005** (fixed bin storage) for stock of material **LES02-##** that can be removed from storage.
 - c) Choose *Stock Removal Foreground* , check the system default value and confirm with *Enter*.
 - d) Create the transfer order by saving.

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4. Call up the stock overview again for your material **LES02-##**.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Warehouse Management)* or *Refresh*  if you have opened the stock overview in another session.
 - b) The transfer order quantity is shown as both a *stock to remove from storage* in the fixed bin storage area, and as a *stock to put away* in the goods issue area.
5. Confirm the transfer order.
 - a) Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Other Transactions* → *Picking* → *Confirm Transfer Order* → *Single Document* → *In One Step*.
 - b) You can choose again between foreground and background processing. Confirmation in the foreground is usually only necessary if differences have occurred.
6. Check the stock overview again.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Warehouse Management)*.
 - b) The negative stock in the goods issue area is balanced.



Lesson Summary

You should now be able to:

- Create a transfer order for a transfer requirement
- Confirm the transfer order
- Track the stock removal in the stock overview

Lesson: Outbound Deliveries for Sales Orders

Lesson Overview

In this lesson you will learn about the connection between Logistics Execution and Sales and Distribution. Particularly important is the outbound delivery (the document), which is the central focus of this goods issue process.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the goods issue process with outbound deliveries
- Create a sales order
- Check the scheduling of the shipping process
- Create an outbound delivery for a sales order
- Call up and interpret document data that is relevant for the stock removal

Business Example

Customers from the model company will receive deliveries of stock materials. Warehouse Management should be used to pick the goods.

Goods Issue Process with Outbound Deliveries: Process Flow

The following overview outlines the technical postings involved in an outbound delivery process involving Warehouse Management.

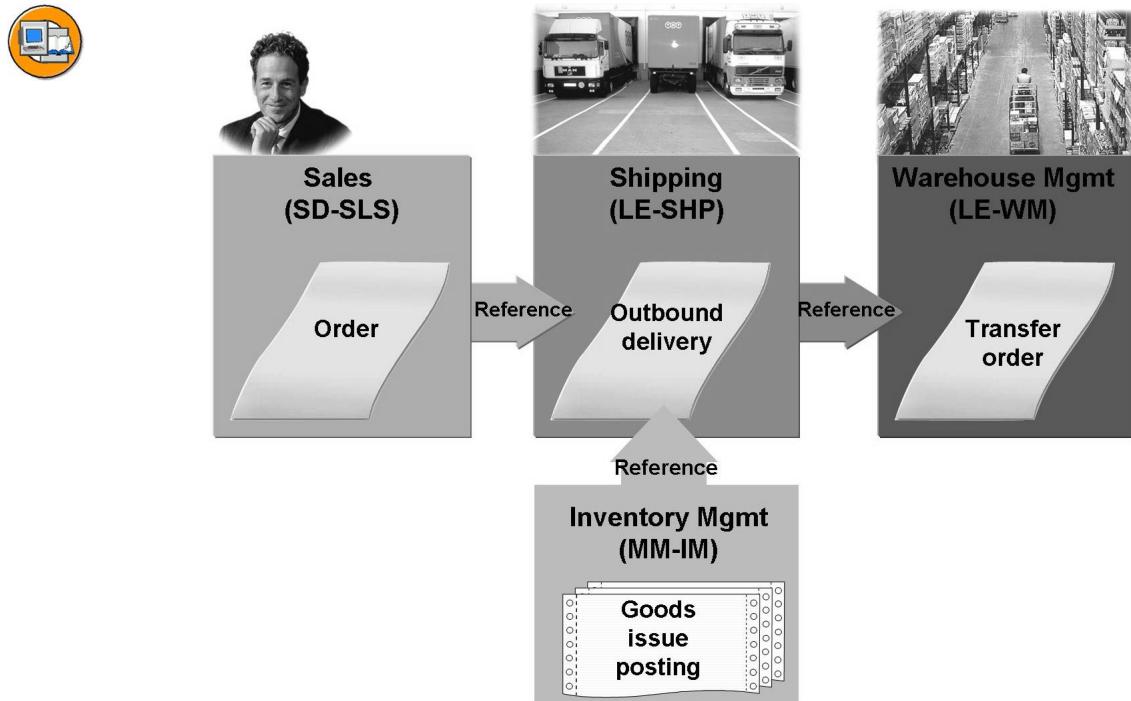


Figure 36: Goods Issue Process with Outbound Deliveries: Process Flow

In SAP ECC, sales orders are created and monitored in Sales Order Management. The standard system contains a selection of **sales document types**, which are mainly used to summarize orders according to their function. You make essential Customizing settings for controlling SD processes in the sales document type.

→ **Note:** There are some preconfigured settings, such as a “standard order” for normal SD processing and a “rush order” for urgent orders.

When you create a sales order, the shipping process is **scheduled** according to the Customizing settings. This means that time limits are calculated for certain steps in the process (for example, loading the goods). This calculation is made for each document item.

→ **Note:** Shipment scheduling is dependent on the sales document type selected by the sales employee.

The central document in Logistics Execution, the **outbound delivery**, is created with reference to the order. You have the choice between various forms of collective processing. The outbound delivery adopts the main data from the order, including the planned dates for the follow-on process. In the outbound delivery, the system also determines a **picking location** for each document item. If the system determines that this storage location has been assigned to a **warehouse number** in Customizing, it displays this warehouse number in the outbound

delivery. The system also assigns an overall picking status and a stock removal status. The user can then see immediately whether the subsequent stock removal must be performed using a **transfer order**.

You create the transfer order for the stock removal with reference to the outbound delivery. The master data and Customizing settings for Warehouse Management define which storage bin stocks are picked. The **goods issue** can only be posted in Inventory Management once the stock removal is complete. The reference document is the outbound delivery again.

→ **Note:** Status management in the document prevents the goods issue from being posted before picking has been completed. It is only possible to post the goods issue once both statuses are set to **C**.

Packing of the goods can also be mapped in the outbound delivery. If you are using the Warehouse Management System, you can choose to pack the picked material in connection with confirmation of the transfer order (**pick and pack**).

Shipment Scheduling in Sales Orders

When you create a sales order, the system first determines a **requested delivery date** and displays it in the document overview. The system calculates this requested delivery date based on the lead time defined in Customizing for the sales document type. The system adds this number of days to the current date.

After you enter the sold-to party's customer number, the ship-to party's customer number (where these are different), and the material numbers, the system performs **shipping point determination** and **route determination** for each document item. Shipping points are **organizational units** within Logistics Execution.

→ **Note:** When you create an outbound delivery, you must enter a shipping point. You can only use the shipping points determined in the order. Every outbound delivery is processed by one shipping point. If different shipping points were found for individual items in the order, a **delivery split** takes place. The system creates the relevant number of outbound deliveries for the order.

Routes are master data in Logistics Execution. A route describes a distance from A to B. The data record can contain information on the service provider, the distribution channel, and the transit time.

→ **Note:** You can make specific entries for the point of departure and the destination (for example, "Hamburg - Munich"). However, you can also enter a more vague description (for example, "East Coast USA").

The shipping point and route are the two sources for the **time limits** that the system uses for shipment scheduling. The more exact you want scheduling to be, the more detail you need to enter for the routes. For example, this would mean that the route “Hamburg - Munich” could have separate routes for shipping by post, by truck, and by plane.

- **Note:** You can also use the route as a selection criteria for collective processing of orders due for delivery.

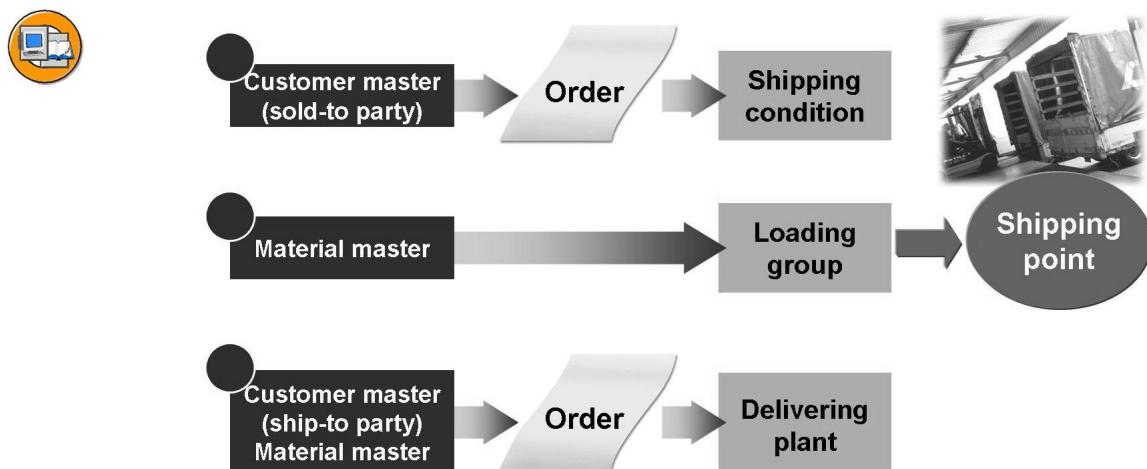


Figure 37: Determining the Shipping Point

The three factors that define shipping point determination are the **shipping condition** valid for the order, the **delivering plant**, and the **loading group** of the material in the delivering plant. You can set the shipping condition and delivering plant as default values in the customer master record. However, you can also make manual entries and changes in the order. A loading group groups together materials according to their loading attributes. Shipping conditions and loading groups are freely definable in Customizing, so that they can be easily assigned at master data level. You can also enter a delivering plant in the material master as a default value (first Sales and Distribution view). The third possible source for the delivering plant value in the order is a **customer-material information record**, which contains specific agreements as the master data for Sales and Distribution.

- **Note:** If this type of customer-material information record exists, it takes priority during plant determination. The system next checks the ship-to party's customer master, and then the material master where necessary. If no default value stored anywhere, the user has to enter the delivering plant manually for the item.

The system determines the route using specific data from the customer master, material master, and shipping point. Route determination therefore depends on a successful shipping point determination.

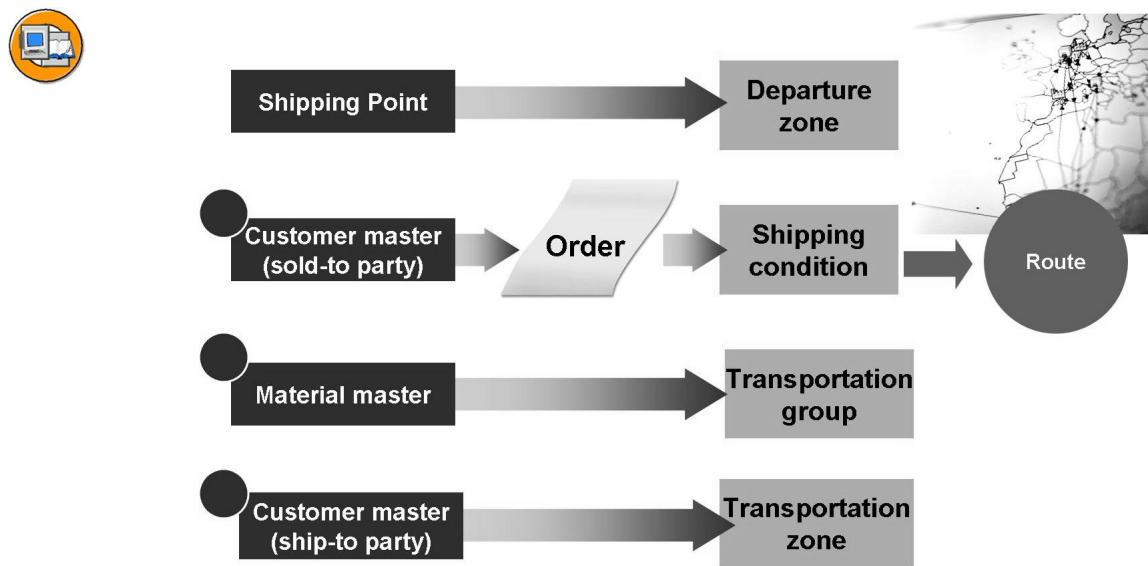


Figure 38: Determining the Route

The system adopts the **departure zone** for the outbound delivery from the shipping point. As in shipping point determination, the **shipping condition** comes from the customer master of the ordering party. You can change this manually in the order.

→ **Note:** If you change the shipping condition in the order, the system repeats shipping point determination and route determination. You can also manually assign a route in the order.

You first define the material **transportation group** in Customizing. Then assign the transportation group to the material master in the *Sales: Gen./Plant Data* view. Transportation groups group together materials according to their transportation attributes (for example, on pallets, in containers).

The system searches for the **transportation zone**, in other words the regional destination of the outbound delivery, in the customer master for the ship-to party. You define transportation zones in Customizing in the same way as transportation groups.

On the basis of values from the shipping point and route in the order, the system proposes **dates** for the following shipping activities:

- Staging (picking, packing, creating shipping documents)
- Loading
- Transportation planning (booking freight space, and so on)
- Goods issue

The system adopts the **pick/pack time** from the shipping point in order to calculate the material availability date. For the loading date, the system adopts the **loading time**. The route is the source for the **transportation lead time** and the **transit time** that are needed to calculate the transportation planning date and/or goods issue date.

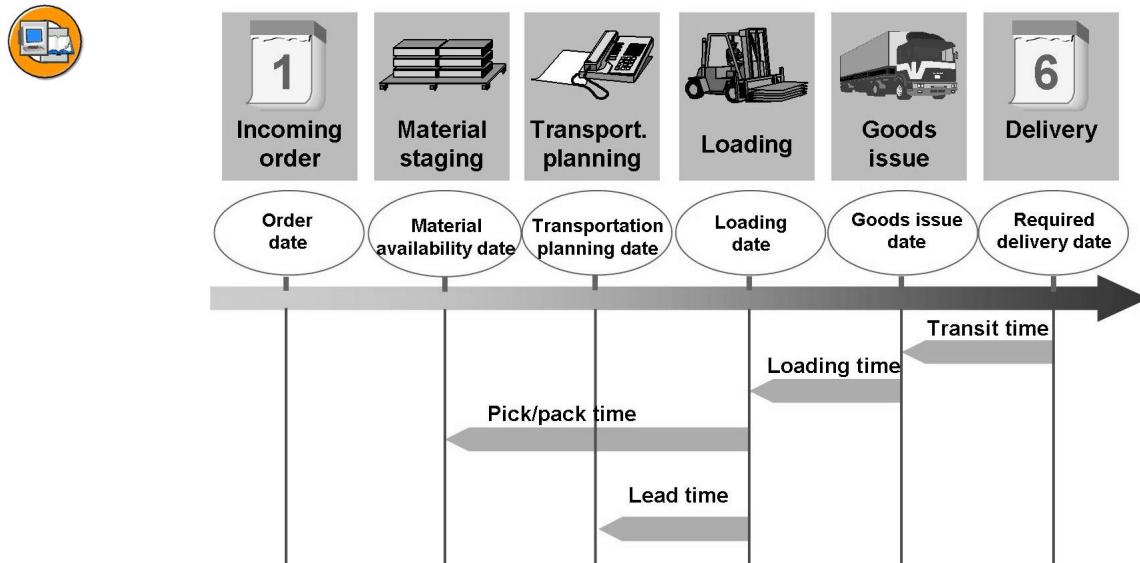


Figure 39: Shipment Scheduling

Starting from the requested delivery date, the system calculates the four planned dates by subtracting the time limits adopted from the shipping point and the route. The transit time is subtracted from the requested delivery date in order to determine the goods issue date. The goods issue date minus the loading time gives us the loading date. The pick/pack time and transportation lead time are subtracted from the loading date to calculate the material availability date and the transportation planning date (**backwards scheduling**).

→ **Note:** The latest creation date for the outbound delivery date is either the material availability date or the transportation planning date, depending which date is earlier.

When you create the outbound delivery, these dates are copied to the document header, because the shipping point and route are consistent for each outbound delivery.

→ **Note:** During outbound delivery creation, the shipping point and route are **split criteria**. If the system determines more than one shipping point or route in the order, then the relevant number of outbound deliveries are created (see above).

If the system has a problem during shipment scheduling when calculating backwards from the requested delivery date, for example, because there is no available material stock, then it tries to propose a realistic staging date (earliest material availability). It then adds four time limits to this that divide up the shipping process, in order to reach a new delivery date (**forwards scheduling**).

For certain transactions, it is advisable to avoid shipment scheduling. The sales document type “rush order”, delivered with the standard system, does not require scheduling since all required steps should be performed as quickly as possible one after the other.

Item Categories in the Outbound Delivery

Like almost all Logistics documents in SAP ECC, the outbound delivery also has a **header level** and an **item level**. Data at header level always applies to the entire document (for example, ship-to party, shipping point, route, and dates for shipping processing). Delivery items are usually mapped for the material quantities ordered by the customer. However, there can also be document items for packaging materials, or texts.

The **item category** shows you the type of the delivery item. You define delivery item categories in Customizing for Shipping. They are identified by three-character or four-character keys (for example, **TAN** for a *standard item* or **TATX** for a *text item*). When you create an outbound delivery for a sales order, the system copies the relevant key for the item category from the order into the outbound delivery. Delivery-relevant order item categories and their corresponding delivery item categories must also have the same key. If there are non-order-dependent items in the outbound delivery (such as for packaging material), or if the outbound delivery is created without reference to a sales order, the system must perform an **item category determination**.

→ **Note:** This determination is also based on Customizing settings. The vendor types and item category groups for the materials to deliver are linked in a table containing delivery item categories.

In Customizing for the delivery item category, you specify if and how the system should check the quantities for a delivery item (for example, for over- and underdeliveries) to see whether the item is relevant for picking and whether it can or must be packed.

Exercise 14: Outbound Deliveries for Sales Orders

Exercise Objectives

After completing this exercise, you will be able to:

- Create and deliver an order

Business Example

Your customer, PC-World Stuttgart KG, orders five bases **LES04-##**.

Task:

Create an order, and then create an outbound delivery for the order.

1. Create a standard order for ordering party **T-S11B##** for five pieces of material **LES04-##**. The customer manages this order under the purchase order number **SCM601-##**.
2. Check the shipping point determination and route determination for the document item.
3. Display the shipment scheduling for the document item (material **LES04-##**) and create the order. Make a note of the document number:

4. Call up your order in change mode. From the order, go to the customer master record. This is the source for the delivering plant, shipping condition, and transportation zone.
5. From the order, display the loading group and transportation group for material **LES04-##** in the material master record.
6. Try to create an outbound delivery with reference to your order. Use today's date as the selection date. Your shipping point has the key **X0##**. What happens?
7. If you cannot remember the material availability date from your order, call up the order in display mode to find the date.
8. Try to create the outbound delivery for your order again. To do this, change the default selection date to the material availability date from your order.
9. Check the shipping deadlines in the outbound delivery and save your data.

Solution 14: Outbound Deliveries for Sales Orders

Task:

Create an order, and then create an outbound delivery for the order.

1. Create a standard order for ordering party **T-S11B##** for five pieces of material **LES04-##**. The customer manages this order under the purchase order number **SCM601-##**.
 - a) Choose *Logistics → Sales and Distribution → Sales → Order → Create*.
 - b) Select order type **OR (Standard Order)** and confirm your entries by choosing *Enter*.



Hint: You do not need to enter data in any other fields. In the next step, the system will determine the sales area data from the customer master record.

- c) Enter the following data, then confirm by choosing *Enter*.

Sold-to party	T-S11B##
PO Number	SCM601-##
Material	LES04-##
Order quantity	5

Continued on next page

2. Check the shipping point determination and route determination for the document item.
 - a) Select the item and choose *Goto → Item → Shipping*.
 - b) You should see the following data:

Plant	1200
Shipping Point	X0##
Route	R00125



Caution: Make sure that the system uses shipping point **X0##**. If the system has found a different shipping point, check the shipping condition in the document header and change this where necessary to your group-specific shipping condition (50 + group number ##). (Choose *Goto → Header → Shipping*).

3. Display the shipment scheduling for the document item (material **LES04-##**) and create the order. Make a note of the document number:

-
- a) Select the item and choose *Goto → Item → Schedule lines*. Then choose *Shipping*.
 - b) Under the requested delivery date, the system displays the four key dates:
 - Goods issue date
 - Loading date
 - Material availability date
 - Transportation planning date

To create the order, return to the overview screen and save your entries. The document number is displayed in the status line.

Continued on next page

4. Call up your order in change mode. From the order, go to the customer master record. This is the source for the delivering plant, shipping condition, and transportation zone.
 - a) Choose *Logistics → Sales and Distribution → Sales → Order → Change*.
 - b) If it does not appear as a default, enter the order number and confirm your entry with *Enter*. Then choose *Display Sold-To Party*  to return to the customer master record.
 - c) Choose *Sales Area Data*.
 - d) Choose the *Shipping* tab page. You should see the following data:

Shipping conditions	Group-specific key (50 + group number ##)
Delivering plant	1200
Transportation zone	D000070000



Hint: If the *Delivering Plant* field in your customer master record is empty, the system has used the plant from the material master in the *Sales: Sales Organization* view.

Go back to the order.

5. From the order, display the loading group and transportation group for material **LES04-##** in the material master record.
 - a) Select the document item for material **LES04-##** and choose *Environment → Display Material*.
 - b) Go to the *Sales: general/plant* tab page. You should see the following data:

Transportation group	0001
Loading group	0002

Go back to the order.

Continued on next page

6. Try to create an outbound delivery with reference to your order. Use today's date as the selection date. Your shipping point has the key **X0##**. What happens?
 - a) Go to *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Outbound Delivery* → *Outbound Delivery* → *Create* → *Single Document* → *With Reference to Sales Order*.
 - b) Enter your shipping point **X0##** and your order number. Confirm your entries with *Enter*.



Hint: The system usually proposes this data.

- c) You receive an error log: *No schedule lines due for delivery up to selected date*. In the status line, the following message is displayed: *The order cannot be delivered*.
7. If you cannot remember the material availability date from your order, call up the order in display mode to find the date.
 - a) Choose *Logistics* → *Sales and Distribution* → *Sales* → *Order* → *Display*. Enter your order number from exercise 3 and choose *Enter*.
 - b) Select the document item and in the menu choose *Goto* → *Item* → *Schedule lines*. On the *Schedule Lines* tab page, choose *Shipping*.
8. Try to create the outbound delivery for your order again. To do this, change the default selection date to the material availability date from your order.
 - a) Go to *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Outbound Delivery* → *Outbound Delivery* → *Create* → *Single Document* → *With Reference to Sales Order*.
 - b) Use the material availability date from your order as the selection date and choose *Enter*.



Hint: You can call up a calendar using the input help for the *Selection Date* field.

9. Check the shipping deadlines in the outbound delivery and save your data.
 - a) Choose *Goto* → *Header* → *Processing*.
 - b) The shipping data is now valid for the entire document. Create the outbound delivery by choosing *Save*.



Lesson Summary

You should now be able to:

- Describe the goods issue process with outbound deliveries
- Create a sales order
- Check the scheduling of the shipping process
- Create an outbound delivery for a sales order
- Call up and interpret document data that is relevant for the stock removal

Lesson: Stock Removal and Goods Issue Posting

Lesson Overview

If you are using the Warehouse Management System, picking for the outbound delivery is always performed using a transfer order. The goods issue posting in Inventory Management completes the process.



Lesson Objectives

After completing this lesson, you will be able to:

- Create and confirm a transfer order for an outbound delivery
- Post the goods issue for an outbound delivery
- Use the outbound delivery monitor
- Name the options available for collective processing and automated processing

Business Example

Goods to be delivered are removed from storage and are placed in the goods issue area. Afterwards, the goods issue is posted in Inventory Management.

Stock Removal for Outbound Deliveries

At the start of the goods issue process using outbound deliveries, there is usually an **order** or sales document that is created in the Sales and Distribution area menu. The **outbound delivery**, which is central to this process, is created with reference to the order. The subsequent stock removal of the goods to deliver uses the **transfer order**, which in turn refers to the outbound delivery. Completion of the picking transaction is reported to the system when the transfer order is confirmed. Only then is it possible to post the **goods issue** for the outbound delivery in Inventory Management.

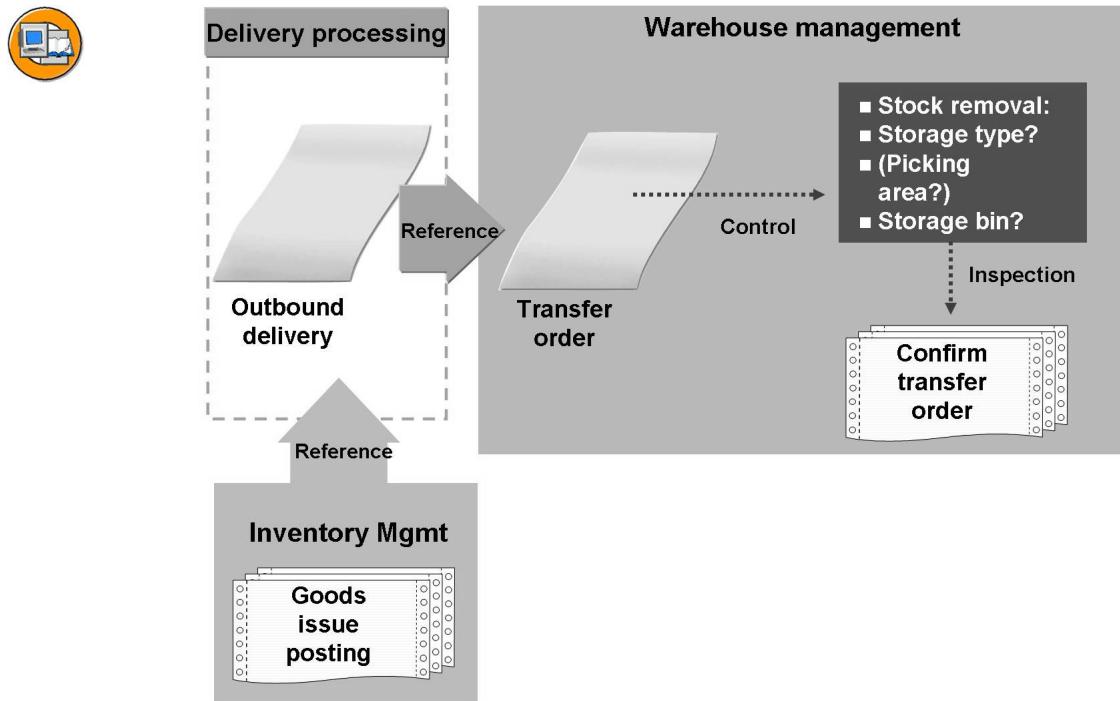


Figure 40: Goods Issue Process with Outbound Deliveries: Overview

When you create the outbound delivery, the system attempts to determine a **picking storage location** for each document item. You make the settings for picking location determination in Customizing for Shipping. The prerequisite for this is that you have activated the function for the relevant delivery item category. During determination, the system takes the following factors into account:

- The shipping point
- The delivering plant
- The storage condition of the material

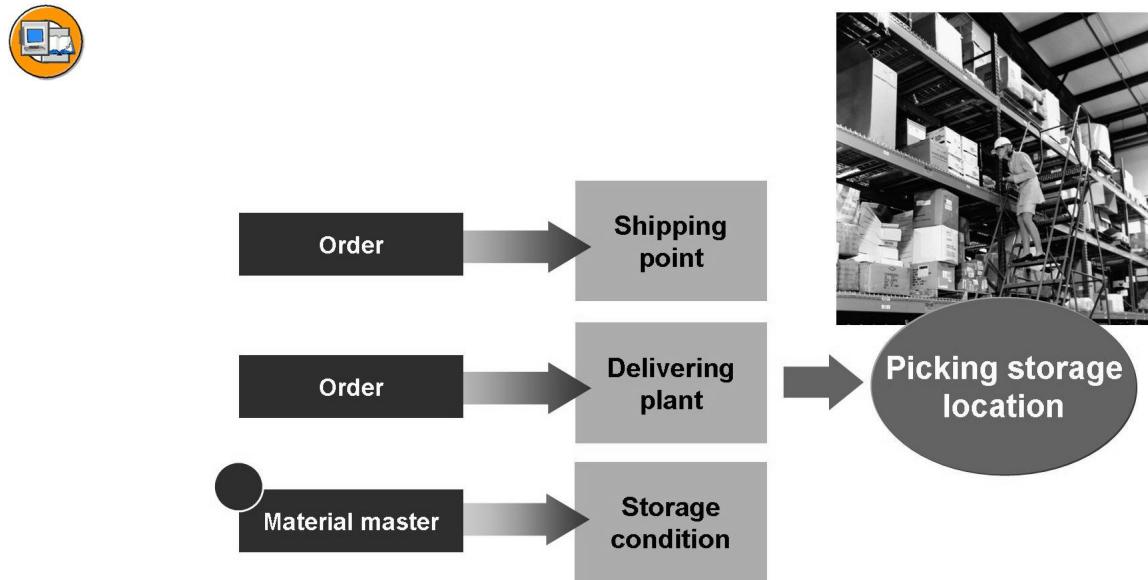


Figure 41: Picking Storage Location Determination

The system adopts the **shipping point** and **delivering plant** from the order. The **storage condition** of the material is stored in the *General Plant Data/Storage 1* view of the material master, and is copied into the outbound delivery. You define storage conditions in Customizing for Shipping, in order to roughly indicate the requirements for the storage of a material. They are only used in storage location determination.

→ **Note:** Storage location determination does not have to run for a specific material. This allows the system to limit its search to the shipping point and delivering plant.

Before picking, users can manually change the storage location proposed by the system in the outbound delivery.

In connection with picking storage location determination, the system also checks whether the storage location determined in Customizing has been assigned to a **warehouse number**. If an assignment has been made, you must create a transfer order in order to remove the material from stock.

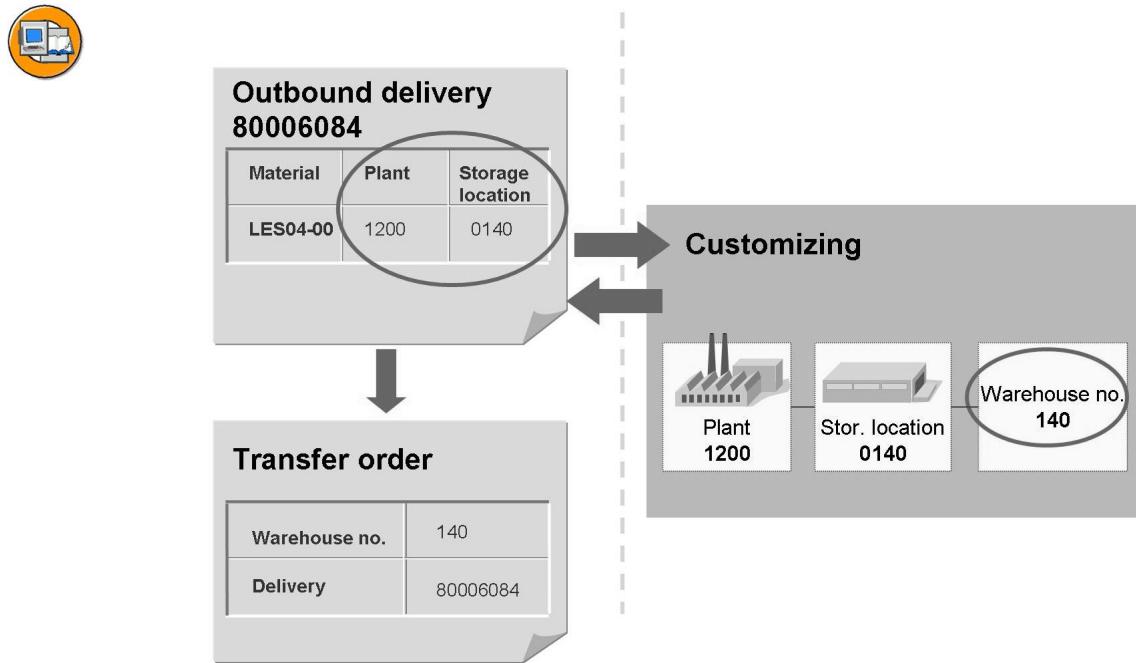


Figure 42: Determining the Warehouse Number

As well as the warehouse number, the system shows two statuses in the outbound delivery:

- An overall status of picking
 - An overall status of the transfer order
- **Note:** In Customizing, you can set the warehouse number for each delivery type as a split criterion at delivery creation. The deliveries then always “have identical warehouse numbers”.

Lean Warehouse Management

Not every company requires a Warehouse Management System, and sometimes putaway and stock removal are performed in highly-specialized, almost completely automated systems that are controlled by separate software. If storage bin management is not required in the SAP system, **Lean Warehouse Management (Lean WM)** can be used as of SAP R/3 4.0, instead of the “actual” Warehouse Management System. Here, the stocks are only managed at **storage location level**. However, the **transfer order** is still used for picking. In contrast to SAP Warehouse Management, the transfer order in Lean WM does not have a

controlling function. It can either be printed as a picking sheet or used as a means of communication between SAP ECC and an external system such as a warehouse control unit. Therefore there are few Customizing settings to be made.

→ **Note:** You require only one warehouse number and two storage types (fixed bin storage and a goods issue area). This data is only similar in form to the organizational units from Warehouse Management; they do not have any control functions. Their only task is to enable creation of transfer orders for outbound deliveries. The lean warehouse number is connected to a plant-storage location combination in Customizing for the Enterprise Structure, in the same way as a “real” warehouse number. Using indicators that are set in Customizing for Shipping, the system can, at any time, identify a warehouse number as a lean warehouse number.

Collective Processing of Outbound Deliveries

Alongside manual creation of single transfer orders for a single outbound delivery, there are several options for collective processing:



- Automatic creation of transfer orders using report RLAUTA20
- Group formation in the outbound delivery monitor, and subsequent transfer order creation for the group
- Two-step picking

The prerequisite for using program **RLAUTA20** is that message type **WMTA** (*Automatic Transfer Order*) is determined in the outbound delivery. This message type is used to create a transfer order for the outbound delivery in the background. Depending on your settings for message determination, a message of type WMTA is determined in the outbound delivery under certain conditions, such as when a particular delivery type is combined with a particular shipping condition. This message is processed using the program **RSNAST00**. This program calls up RLAUTA20 to create a transfer order for the outbound delivery.



Hint: The system creates one transfer order for each outbound delivery regularly. In SAP R/3 Enterprise, you can now create a single transfer order for a group of outbound deliveries.

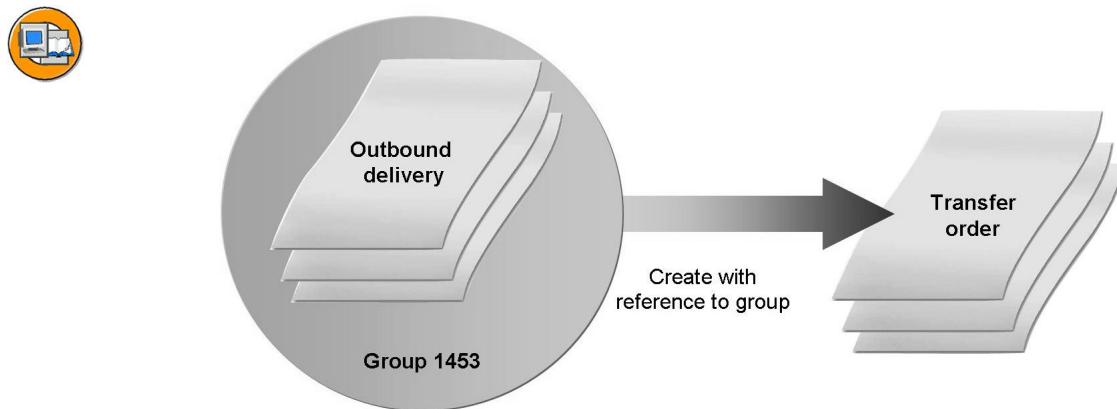


Figure 43: Collective Processing of Outbound Deliveries

Using the **outbound delivery monitor**, you can summarize outbound deliveries according to various criteria into **groups**, in order to process them collectively during the subsequent picking. The outbound delivery monitor also enables you to perform the remaining steps of the outbound process from a single screen. Even without forming groups, in the outbound delivery monitor you can always process several outbound deliveries collectively.

→ **Note:** A main advantage of the outbound delivery monitor is its many selection options. The monitor therefore allows you access to specific outbound deliveries. For example, this means you can collectively process all outbound deliveries that you want to deliver to the customer using a specific forwarding agent.

The **wave pick** is a special form of collective processing during transfer order creation. Outbound deliveries are again summarized into groups for further processing. However, time-based criteria take priority in the selection, for example, a joint goods issue time.

→ **Note:** In Customizing for Shipping, you specify when picking occurs during the course of a working day. You also specify the compare time for each warehouse number, which should be used when selecting outbound deliveries. You can use wave pick profiles to specify weight and volume limits, and also a maximum processing time for each wave.

Two-step picking is also a special form of collective processing of outbound deliveries. In this procedure, stock is removed from storage in two steps; one withdrawal and one allocation step. The prerequisite for this is that outbound deliveries have been summarized into groups. In the withdrawal step, you create a single transfer order to remove all materials of the group from storage. The cumulated material quantities are placed into interim storage in a separate storage

type. In the subsequent allocation to the outbound deliveries involved, the system generates one transfer order for each outbound delivery. The material is transported from the interim storage type to the goods issue area.

Exercise 15: Outbound Delivery Process: Stock Removal with Transfer Order and Goods Issue Posting

Exercise Objectives

After completing this exercise, you will be able to:

- Create a transfer order for outbound deliveries, confirm it, and then post the goods issue for the outbound delivery

Business Example

Your customer, PC-World Stuttgart KG, ordered five bases **LES04-##**. You trigger removal of the material from stock and it is moved to the goods issue area. The goods leave your company from this area.

Task:

Create a transfer order for the outbound delivery, confirm it, and post the goods issue for the delivery.

1. In the outbound delivery monitor, find an outbound delivery where the material item from your warehouse number **1xx** should be picked.



Hint: Select your outbound delivery using the material number **LES04-##**. To do this, choose *Item View* in order to see the material items to be delivered.

2. Call up the outbound delivery from the *Daily Pick List* in display mode, and check the two picking statuses.
3. In the outbound delivery, display the destination data (storage type and storage bin) for the stock removal of your material **LES04-##**.
4. Go back to the outbound delivery monitor and create the transfer order in the foreground.
5. Remove material **LES04-##** from storage. Again, you can choose between foreground and background processing. Save your data.



Hint: Use background processing if you do not want to change the system proposals for the issuing storage type and issuing storage bin.

Continued on next page

6. Confirm the transfer order from the *Logistics Execution* area menu and then check the stocks of your material.
7. Post the goods issue for the outbound delivery. Before you post, check the overall picking status and the status of transfer order processing.
8. Check the stock overview **LES04-##** in your warehouse number **1xx**.

Solution 15: Outbound Delivery Process: Stock Removal with Transfer Order and Goods Issue Posting

Task:

Create a transfer order for the outbound delivery, confirm it, and post the goods issue for the delivery.

1. In the outbound delivery monitor, find an outbound delivery where the material item from your warehouse number **1xx** should be picked.



Hint: Select your outbound delivery using the material number **LES04-##**. To do this, choose *Item View* in order to see the material items to be delivered.

- a) Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Outbound Delivery* → *Outbound Delivery* → *Lists and Logs* → *Outbound Delivery Monitor*.
 - b) Choose *For Picking* and enter your warehouse number **1xx**. To execute the selection, choose *Execute* . The system displays the document numbers of four outbound deliveries in the status line.
 - c) Choose *Item View* and select the outbound delivery that contains **LES04-##**.
2. Call up the outbound delivery from the *Daily Pick List* in display mode, and check the two picking statuses.
 - a) To display the outbound delivery, double-click the document number.
 - b) Select the *Picking* tab page. Before picking begins, the status is **A** for each.
 3. In the outbound delivery, display the destination data (storage type and storage bin) for the stock removal of your material **LES04-##**.
 - a) Select the material item and choose *Goto* → *Item* → *Picking*.
 - b) The destination data is the interim storage area **916** (shipping zone deliveries) and a dynamic storage bin with the document number of the outbound delivery as its coordinates.

Continued on next page

4. Go back to the outbound delivery monitor and create the transfer order in the foreground.
 - a) Choose *Back* 
 - b) Select your outbound delivery and choose *TO in Foregr.*. This brings you to the initial screen of transaction LT03 (*Create Transfer Order for Delivery Note*). Confirm your entries with *Enter*.
 - c) On the next screen, choose *Storage Type Search Sequence* to access the *Preparation for Stock Removal* screen.
5. Remove material **LES04-##** from storage. Again, you can choose between foreground and background processing. Save your data.



Hint: Use background processing if you do not want to change the system proposals for the issuing storage type and issuing storage bin.

- a) Choose *Stock removal foreground* , for example. Confirm the warning message for the document item by choosing *Enter*.
 - b) Choose *Generate and Next Material* to return to the tab page overview. You have the option to save now and therefore create the transfer order.
 - c) To leave the outbound delivery monitor, choose *Back* 
6. Confirm the transfer order from the *Logistics Execution* area menu and then check the stocks of your material.
 - a) Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Outbound Delivery* → *Picking* → *Confirm Transfer Order* → *Single Document* → *In One Step*.
 - b) You can confirm the transfer order in the background. In the *Control* screen area, select the *Background* indicator in the *Process* field, and confirm your selection with *Enter*.
 - c) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Warehouse Management)*.
 - d) Enter your warehouse number **1xx** and the material number **LES04-##**, and confirm your entries by choosing *Enter*: The material quantity removed from stock can be found in the interim storage type **916**.

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7. Post the goods issue for the outbound delivery. Before you post, check the overall picking status and the status of transfer order processing.
 - a) Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Receipt for Outbound Delivery* → *Post Goods Issue* → *Outbound Delivery Single Document*.
 - b) If the system does not propose the document number of your outbound delivery, enter the number in the relevant field and choose *Enter*.
 - c) Select the *Picking* tab page. Both statuses must be flagged with **C** (*Completely Picked* or *WM-TO Confirmed*).
 - d) Choose *Post Goods Issue*.
8. Check the stock overview **LES04-##** in your warehouse number **1xx**.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Warehouse Management)* or *Refresh*  if you opened the stock overview in another session.
 - b) Enter your warehouse number **1xx** and the material number **LES04-##**, and confirm your entries by choosing *Enter*: The delivered quantity was cleared from the interim storage type **916**.

Exercise 16: Return Transfer for Outbound Delivery (Optional)

Exercise Objectives

After completing this exercise, you will be able to:

- Cancel a goods issue posting for an outbound delivery and return the picked materials to storage

Business Example

IT-Services AG in Frankfurt orders 20 flat screen monitors. The goods are already in the goods issue area when the company cancels the order. You must now reverse the goods issue posting and return the goods to storage.

Task:

Create a sales order, fulfill it, pick the goods and post the goods issue for the outbound delivery. Then cancel the goods issue posting and return the picked goods to storage.

- Create a sales order (order type **OR**) for 20 pieces of material **LES02-##** (ordering party **T-S11C##**). Deliver this order (shipping point **X0##**).
- Create the transfer order for the outbound delivery, and confirm it in the background.



Hint: To do this, from the outbound delivery, choose *Subsequent Functions* to switch to the transaction *Create Transfer Order for Delivery* (transaction code LT03).

- Post the goods issue for the outbound delivery.
- Now reverse this goods issue posting and check the stocks of your material **LES02-##**. There should be 20 pieces again in the interim storage type **916**, the goods issue area.
- Return the material quantity picked in step 2 to storage using transaction LT0G (*Return to stock for delivery*).
- Check the stocks of your material **LES02-##** and your outbound delivery. Check whether the system has reset the picking and transfer order status to **A**.

Solution 16: Return Transfer for Outbound Delivery (Optional)

Task:

Create a sales order, fulfill it, pick the goods and post the goods issue for the outbound delivery. Then cancel the goods issue posting and return the picked goods to storage.

1. Create a sales order (order type **OR**) for 20 pieces of material **LES02-##** (ordering party **T-S11C##**). Deliver this order (shipping point **X0##**).
 - a) Choose *Logistics → Sales and Distribution → Sales → Order → Create*.
 - b) After you enter the order data, choose *Sales Document → Deliver*. Use your shipping point **X0##**. If necessary, move the selection date forward by a week.
2. Create the transfer order for the outbound delivery, and confirm it in the background.



Hint: To do this, from the outbound delivery, choose *Subsequent Functions* to switch to the transaction *Create Transfer Order for Delivery* (transaction code LT03)).

- a) From the outbound delivery menu, choose *Subsequent Functions* to switch to the transaction *Create Transfer Order for Delivery*.
 - b) To confirm the transfer order, choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Confirm Transfer Order → Single Document → In One Step*.
In the *Fgrnd/Bgrnd* field, set the *Background* indicator.
3. Post the goods issue for the outbound delivery.
 - a) Choose *Logistics → Logistics Execution → Outbound Process → Goods Receipt for Outbound Delivery → Post Goods Issue → Outbound Delivery Single Document*.
 - b) Choose *Post Goods Issue*.

Continued on next page

4. Now reverse this goods issue posting and check the stocks of your material **LES02-##**. There should be 20 pieces again in the interim storage type **916**, the goods issue area.
 - a) Choose *Logistics → Logistics Execution → Outbound Process → Goods Receipt for Outbound Delivery → Post Goods Issue → Cancellation/Reversal*.
 - b) The system proposes the last outbound delivery processed for the reversal posting. To execute the selection, choose *Execute* .
 - c) Select your outbound delivery and choose *Cancel/reverse*. Confirm the confirmation prompt with *Enter*. You receive a log reporting the success of the posting. Exit the transaction.
 - d) To go to the stock overview, choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.
5. Return the material quantity picked in step 2 to storage using transaction LT0G (*Return to stock for delivery*).
 - a) Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Cancel Transfer Order → Return Transfer for Outbound Delivery*.
 - b) The system proposes warehouse number **1xx**, your outbound delivery, and Warehouse Management movement type **999** as default values. To execute the selection, choose *Execute* .
 - c) The system proposes the material that was just picked as the material for the return transfer. Select the transfer requirement and choose *Return to stock*.
 - d) Confirm the transfer order that the system created for the return transfer in the background. Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Confirm Transfer Order → Single Document → In One Step*.
6. Check the stocks of your material **LES02-##** and your outbound delivery. Check whether the system has reset the picking and transfer order status to **A**.
 - a) To go to the stock overview, choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.
 - b) Menu path for changing or displaying outbound deliveries: *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Change → Single Document* (or → *Display*).



Lesson Summary

You should now be able to:

- Create and confirm a transfer order for an outbound delivery
- Post the goods issue for an outbound delivery
- Use the outbound delivery monitor
- Name the options available for collective processing and automated processing

Lesson: Transportation Planning in SAP ECC

Lesson Overview

The “Transportation” function is the third part of Logistics Execution. It supports planning and requirements planning for transportation of inbound and outbound goods in SAP ECC. This lesson outlines the range of functions for transportation.



Lesson Objectives

After completing this lesson, you will be able to:

- Name the range of functions within transportation planning
- Explain the fundamental control parameters for the shipment type
- Create a shipment document
- Use this document to map transportation processing in SAP ECC

Business Example

IDES AG plans shipments used to send goods to customers in various locations.

Transportation: Positioning Within the Logistics Process

The transportation functions in SAP ECC are available in order to enhance three forms of the delivery process. These processes are:

- Goods receipts with inbound deliveries
- Goods issues with outbound deliveries
- Stock transport orders with deliveries

The basic principle is always the same: deliveries are summarized into groups according to various selection criteria. Further processing deals exclusively with the group. Process control references a separate document: the **shipment**, or more exactly, the **shipment document**, which is flagged with the number of the delivery group.

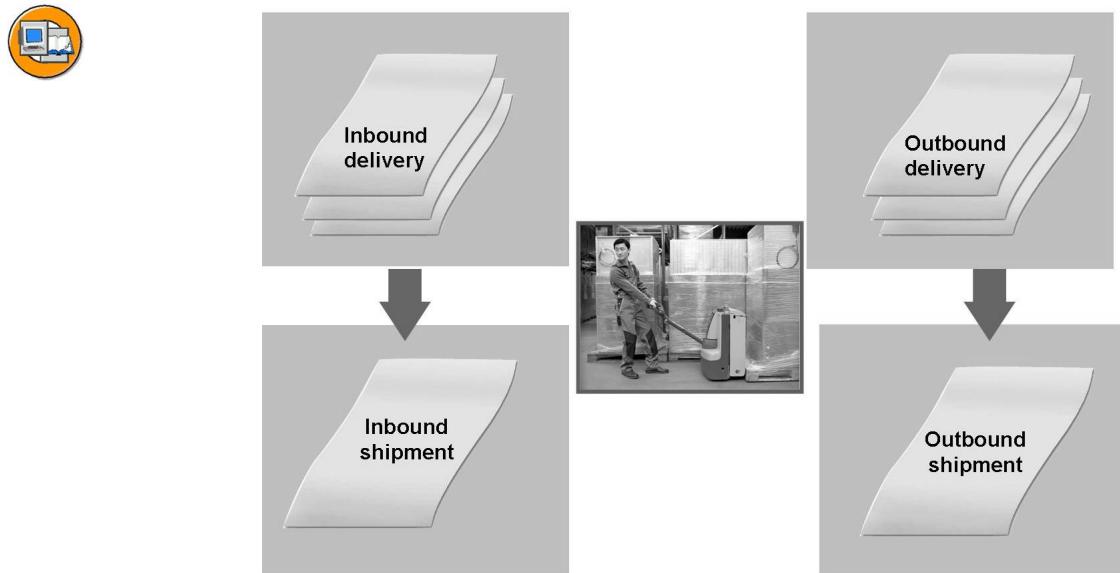


Figure 44: Transportation Function

The shipment document stores the data concerning planning and completion of the process substeps. You can create the document either before picking or after picking is complete. Using transportation functions does not change the process flow of the inbound or outbound process. Instead, it adds an extra step and a document. In connection with this document, you can also process **messages**. The standard system therefore contains preconfigured message types for bills of lading, shipping orders, and invoices accompanying goods. These can be printed, or sent by fax or EDI to the recipient. In the shipment, you can also perform **cross-delivery packing**: packages are either adopted from the delivery and then packed further, or initial packing occurs in the shipment.

An essential part of the transportation functions is **shipment cost calculation and settlement**, which works using **pricing** methods. You can use this subfunction to create detailed forecast estimates of costs that might arise in relation to transportation processing, and then forward this to accounting in order to generate appropriations or create credit memos. You can also invoice the customer for shipment costs in the billing document. A **shipment cost document** is used to calculate and settle shipment costs.

The Shipment Type

A **shipment type** is a collection of process-controlling parameters that you create in Customizing for Transportation. It decides the direction, combination, and mode of transport for a shipment, in addition to the transfer of data from preceding documents and message determination.



Figure 45: Shipment type

The preconfigured shipment types in the standard system can be copied and changed, or enhanced by adding new shipment types. When you create a shipment document, you must always enter a shipment type. The **completion type** of the selected shipment type decides the direction of the shipment; you use the indicator for **process control** to tell the system whether the shipment is a single shipment or a collective shipment. You can differentiate between shipments with one or more modes of transport.

→ **Note:** A **single shipment** always has exactly one point of departure and one destination, regardless of how many deliveries are included in the shipment. A **collective shipment** can have more than one point of departure and destination.

If you want to map a more complex form of transportation processing in the system (several points of departure or different modes of transport), you can create a **transportation chain**. Transportation chains consist of several shipments, each created with a different shipment type. This means that each partial run can be controlled separately.

Transportation chains consist of at least one preliminary leg, one main leg, and one subsequent leg.

→ **Note:** Shipment types that are used to process a “simple” single or collective shipment receive the leg indicator *Direct Leg*.

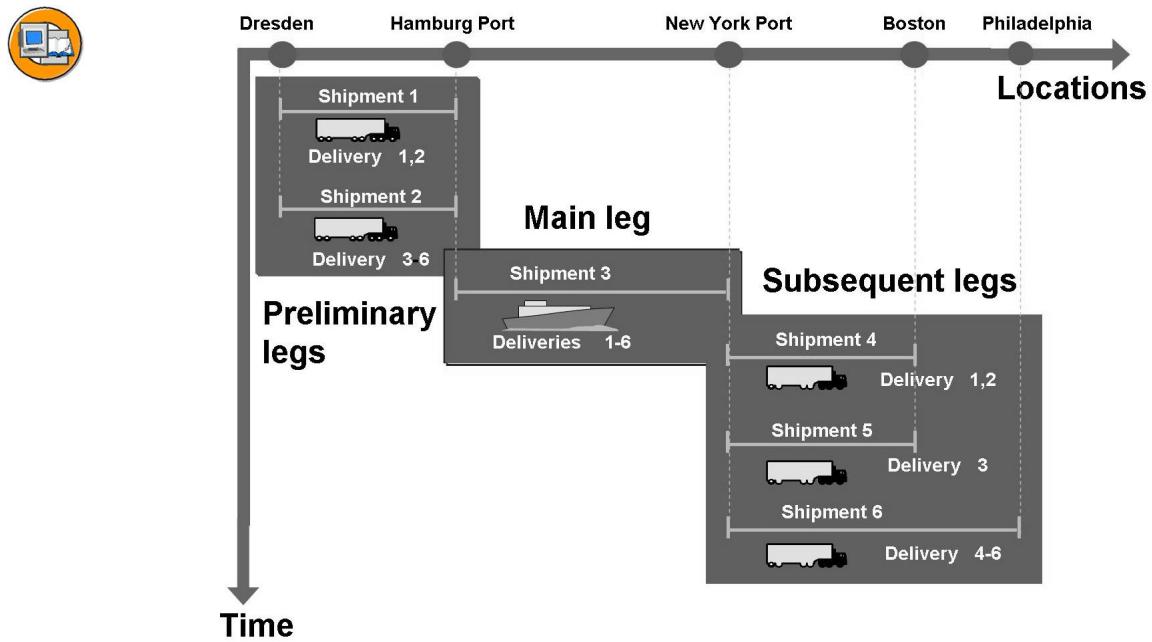


Figure 46: Transportation Chain

The shipment type's **run indicator** specifies the leg type. To be able to create a transportation chain, you need at least three shipment types that are flagged accordingly as *Preliminary*, *Main* or *Subsequent Leg*. If you create a shipment using a shipment type flagged as such, the system recognizes that it is linked to other shipments.

Shipment stages

The shipment type also defines the type of **leg determination**. A shipment can be divided into several stages. Shipments can be divided manually or automatically. SAP ECC contains three defined **shipment stages**:

- Legs
- Load transfer points
- Border crossing points

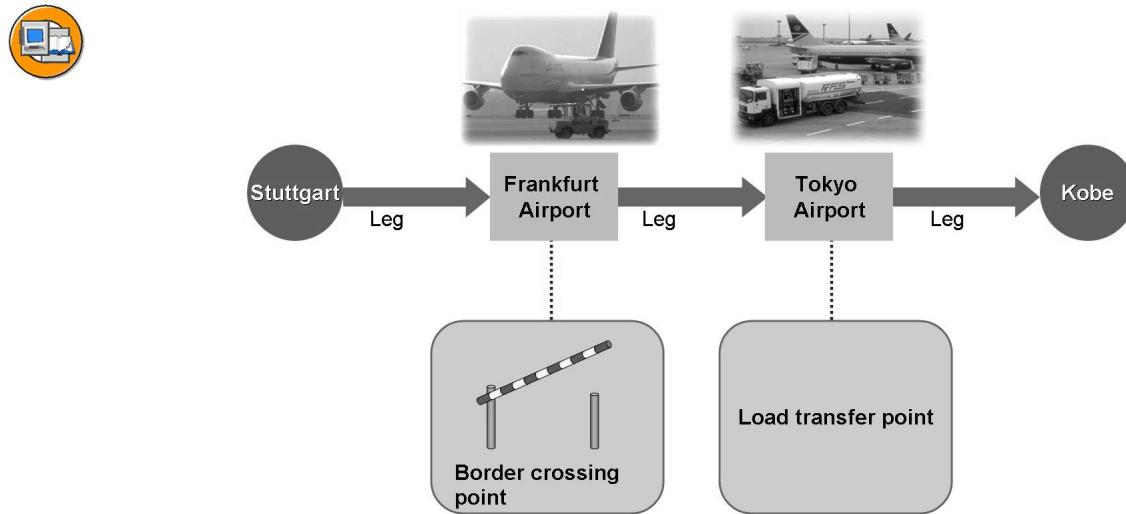


Figure 47: Shipment stages

A leg is a connection between a starting point and an end point (for example, shipping point, plant, customer, or vendor). The means of transport is switched at load transfer points. For example, the goods are loaded from a truck to a ship. Border crossing points are locations where shipments cross national boundaries. Each shipment stage can be linked to specific information (for example, a service provider, a shipment cost calculation, and a shipment schedule). When you create a shipment, this data is copied into the shipment document.

→ **Note:** Shipment stages can also be generated from **routes**. When you create a shipment and enter a route in the document header, the stages are copied from this route. However, you can also copy the route (and therefore its stages) from the delivery. The shipment type defines whether stages are copied from the route.

Leg determination according to the shipment type has an extremely simple structure. It is based on simple rules for determining a useful departure and arrival sequence. Tools for geographical optimization or for planning a vehicle load are not available in SAP ECC. For this reason, there is an interface (SD-TPS) that enables you to connect other transportation planning systems to SAP ECC. These external systems are specialized for specific industries or goods. The transportation planning function **Transportation Planning/Vehicle Scheduling** (TP/VS) in SAP APO is a separate SAP product for enhancing the range of functions for transportation processing in SAP ECC.

Shipment document

The shipment document is the basis for transportation planning. It is used to summarize deliveries into a group according to specific criteria. When you create a shipment, you can select deliveries according to data about the point of departure

or the destination, by time-related criteria (such as transportation planning date or goods issue date), or by other transportation-relevant criteria (such as forwarding agent, Incoterms, shipping condition, route, or means of transport).

→ **Note:** You can only select **transportation-relevant** deliveries. The system decides whether a delivery is transportation-relevant using the delivery type and the route, which must both be flagged as transportation-relevant in Customizing. Users can see the relevance for transportation from the transportation planning status **A** in the overview and in the delivery header.

You can create shipments as single documents. You can also use collective processing, which generates shipment documents using **selection variants**. Selection variants contain a group of criteria used to select deliveries. They also enable background processing.

→ **Note:** For processes that take place regularly, you can assign a selection variant to a shipment type in Customizing. You can simplify manual creation of shipments using **planning proposals**. As with selection variants, you group together selection criteria into a profile. In contrast to collective processing, you can still manually influence how shipments are constructed.

In the shipment document, you can enter dates, service providers, and texts. You can also construct cross-delivery packages (see above). Transportation processing is controlled in the document using predefined **statuses**. These statuses, which flag substeps in the process, range from “Planned” to “Completed”. You can also use statuses for the beginning and end of the shipment process. At any time, users can use the document to track the current progress. In the document, users can also plan specific substeps, such as loading. If the status *Loading End* is set, the system enters the actual time loading was completed.

→ **Note:** In Customizing, you can link each shipment type to **activity profiles** with separate statuses. You can use these profiles to automate message printing. However, you can also tell the system to carry out background processing, consisting of the goods issue posting and billing for all outbound deliveries contained in the shipment, as soon as the assigned status is set in the document and the change is saved.

If you are using Warehouse Management, picking can take place before or after you create the shipment. If the shipment was already constructed before picking, it can be used in a collective run as a group for creating and confirming transfer orders for the deliveries in the shipment.

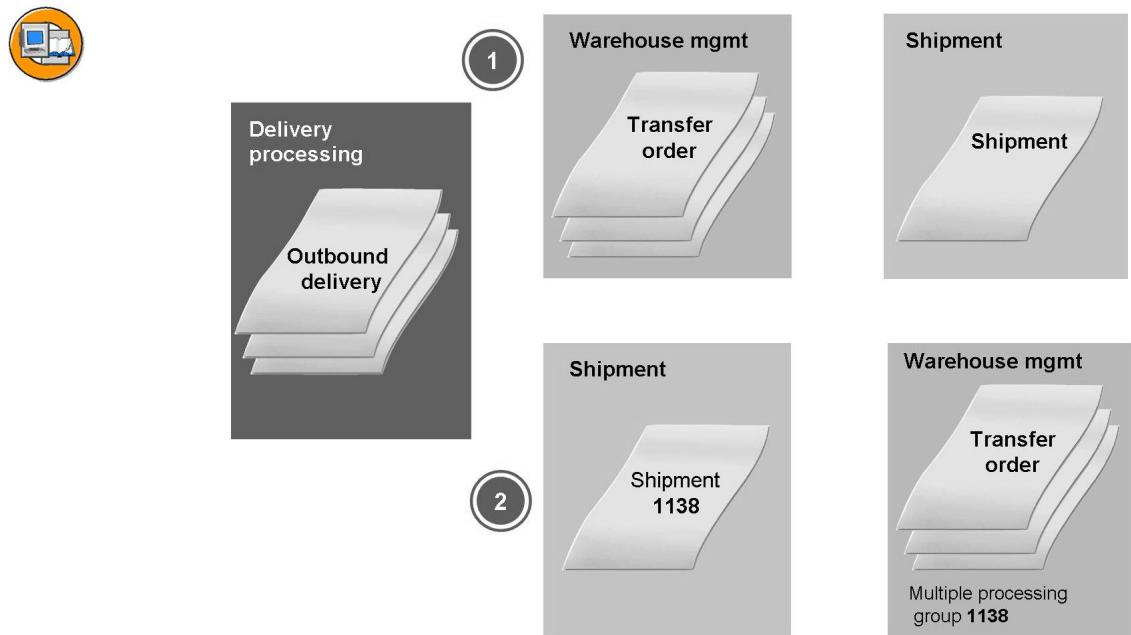


Figure 48: Transportation Processing and Warehouse Management

In the first example, picking was performed **before** a shipment was created. In the second example, the shipment was used as a (outbound delivery) group for constructing wave picks.

Exercise 17: Planning and Completing an Outbound Shipment

Exercise Objectives

After completing this exercise, you will be able to:

- Process an outbound shipment

Business Example

CompuMax GmbH in Frankfurt and PC World Stuttgart KG should both receive deliveries of flat screen monitors and pedestals. All outbound deliveries should be sent to the recipients in the same shipment.

Task:

Create a shipment, then plan and complete it.

1. Create a shipment with shipment type *Collective shipment* for transportation planning point **1200**. Select outbound deliveries using your shipping point **X0##** and your warehouse number **1xx**. The ship-to parties are customers **T-S11A##** and **T-S11B##**.
2. Call up this shipment document in change mode. Add Nordspeed GmbH in Hamburg (vendor number **1058**) as the service provider for transportation, and set the status *Planning Completed*.
3. Call up the shipment document again in change mode in order to check automatic leg determination.
4. Use your shipment as a group for picking in multiple processing. To do this, create a wave pick for the shipment. Make a note of the wave pick number: _____



Hint: For the group number, use your shipment number. The system will assign a separate number for the wave pick, which you will use to create and confirm the transfer orders in collective processing.

5. Use your wave pick to create three transfer orders for the three outbound deliveries in your shipment.
6. To print the transfer orders or release them for transmission to an external system, choose *Release/Print* .
7. Confirm the three transfer orders for the wave pick.
8. To complete the process, return to your shipment and set the status *Shipment Completion*. What happens when you save the data after changing the status?

Solution 17: Planning and Completing an Outbound Shipment

Task:

Create a shipment, then plan and complete it.

1. Create a shipment with shipment type *Collective shipment* for transportation planning point **1200**. Select outbound deliveries using your shipping point **X0##** and your warehouse number **1xx**. The ship-to parties are customers **T-S11A##** and **T-S11B##**.
 - a) Choose *Logistics* → *Logistics Execution* → *Transportation* → *Transportation Planning* → *Create* → *Single Documents*
 - b) Enter transportation planning point **1200** and choose shipment type *Collective Shipment*. Confirm your entries with *Enter*.
 - c) Choose *Deliveries* to collect the outbound deliveries for the shipment. As selection criteria, use your shipping point **X0##**, your warehouse number **1xx**, as well as ship-to parties **T-S11A##** and **T-S11B##**. Start the selection by choosing *Execute* .



Hint: If you want to search for outbound deliveries for both ship-to parties, choose *Multiple selection* , enter the customer numbers as single values and choose *Transfer* .

- d) In the *Shipments and Deliveries* column, the system should display three outbound deliveries. Save the selection. The system issues a shipment number (in the status line). Make a note of this number:



Hint: If the system suggests more than three outbound deliveries, use “Drag and Drop” to move superfluous entries into the *Total of Deliveries Not Assigned* area. Before this, check the ship-to party and status.

Continued on next page

2. Call up this shipment document in change mode. Add Nordspeed GmbH in Hamburg (vendor number **1058**) as the service provider for transportation, and set the status *Planning Completed*.
 - a) Choose *Logistics* → *Logistics Execution* → *Transportation* → *Transportation Planning* → *Change* → *Single Documents*
If the system does not propose the shipment number, enter the number in the relevant field and choose *Enter*.
 - b) In the *Service Agent* field, enter the vendor number for Nordspeed GmbH (**1058**).
 - c) Choose *Planning* and save your input.
3. Call up the shipment document again in change mode in order to check automatic leg determination.
 - a) Choose *Logistics* → *Logistics Execution* → *Transportation* → *Transportation Planning* → *Change* → *Single Documents*
 - b) Go to the *Stages* tab page. Setting the *Planning Completed* status has resulted in two shipment stages: **Dresden - Frankfurt** and **Frankfurt - Stuttgart**.
4. Use your shipment as a group for picking in multiple processing. To do this, create a wave pick for the shipment. Make a note of the wave pick number: _____



Hint: For the group number, use your shipment number. The system will assign a separate number for the wave pick, which you will use to create and confirm the transfer orders in collective processing.

- a) Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Outbound Delivery* → *Picking* → *Wave Picks* → *Create* → *According to Shipment*.
- b) Enter your warehouse number **1xx** and the number of your shipment. To execute the selection, choose *Execute* . The system displays a list of your outbound deliveries.
- c) To create the wave pick, save the selection result.

Continued on next page

5. Use your wave pick to create three transfer orders for the three outbound deliveries in your shipment.
 - a) Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Create Transfer Order → Collective Processing.*
 - b) Enter your warehouse number **1xx** and enter the number of the wave pick in the *Group* field. In the *Foreground/Backgrnd* field, choose *Background* and then confirm by choosing *Start multiple proc..*
 - c) The status line informs you that three transfer orders have been created.
6. To print the transfer orders or release them for transmission to an external system, choose *Release/Print* .

 - a) Choose *Release/Print*  and then exit the transaction. Confirm the warning message with *Yes*.
 - b) If you have forgotten the release, you can perform this now. Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Communication/Printing → Release and Print Wave Pick.* Enter your warehouse number and wave pick number. Select background processing and choose *Release mult.proc.* .

7. Confirm the three transfer orders for the wave pick.
 - a) Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Confirm Transfer Order → Collective Processing.*
 - b) Enter your warehouse number. In the *Group* field, enter your wave pick number, and choose *Execute* .
 - c) The system displays your three transfer orders. Place your cursor on the first line of the transfer order and choose *Confirm Remaining Items* (icon ). Exit the transaction.
8. To complete the process, return to your shipment and set the status *Shipment Completion*. What happens when you save the data after changing the status?
 - a) Choose *Logistics → Logistics Execution → Transportation → Transportation Planning → Change → Single Documents* Enter the number of your shipment document from step 1 and choose *Enter*.
 - b) Choose *Shipment Completion* and save the status change. In the status line, the system informs you that a goods issue will be posted and a billing document will be created in the background for each outbound delivery.



Lesson Summary

You should now be able to:

- Name the range of functions within transportation planning
- Explain the fundamental control parameters for the shipment type
- Create a shipment document
- Use this document to map transportation processing in SAP ECC



Unit Summary

You should now be able to:

- Explain the technical posting process of a goods issue for a cost center with subsequent stock removal
- Post a goods issue for a cost center in Inventory Management
- Display the transfer requirement generated by the goods issue posting
- Interpret the stock overview
- Create a transfer order for a transfer requirement
- Confirm the transfer order
- Track the stock removal in the stock overview
- Describe the goods issue process with outbound deliveries
- Create a sales order
- Check the scheduling of the shipping process
- Create an outbound delivery for a sales order
- Call up and interpret document data that is relevant for the stock removal
- Create and confirm a transfer order for an outbound delivery
- Post the goods issue for an outbound delivery
- Use the outbound delivery monitor
- Name the options available for collective processing and automated processing
- Name the range of functions within transportation planning
- Explain the fundamental control parameters for the shipment type
- Create a shipment document
- Use this document to map transportation processing in SAP ECC



Test Your Knowledge

1. What are the differences between a goods issue *For Other Transactions* and a goods issue *For Outbound Delivery*?

2. What is the function of negative quants in the goods issue area?

Choose the correct answer(s).

- A Negative quants show that something is missing in the warehouse.
- B Negative quants ensure that the total stocks are the same in both Inventory Management and Warehouse Management.
- C Negative quants show that material is to be removed from storage.
- D Negative quants map the temporary situation after the goods issue posting and before stock removal.

3. During stock removal, how does the system determine a storage bin?

4. How can the picking area influence stock removal?

5. What factors influence shipping point determination?

Choose the correct answer(s).

- A The sales document type
- B The sales organization
- C The delivering plant
- D The shipping condition
- E The loading group of the material

6. Which basic dates are determined during shipment scheduling?

7. Which factors play a part during picking location determination?

Choose the correct answer(s).

- A The shipping point
- B The warehouse number
- C The delivering plant
- D The picking area
- E The palletization data of the material
- F The storage condition of the material

8. Lean Warehouse Management is

Choose the correct answer(s).

- A A Warehouse Management system with a reduced scope of functions
- B Not a warehouse management system
- C A means of using transfer orders even without storage bin management
- D A tool for connecting external systems for storage bin management to your own SAP system.

9. How can you tell from the outbound delivery that a transfer order is required for picking?

10. What is the message type **WMTA** used for?

11. What does the completion type for the shipment type control?

12. What are the differences between single shipments and collective shipments?

13. Which types of shipment stages can be determined from the route?



Answers

1. What are the differences between a goods issue *For Other Transactions* and a goods issue *For Outbound Delivery*?

Answer: For a goods issue *For Other Transactions*, the process **starts** with the goods issue posting. In an outbound delivery process, the goods issue posting **completes** the process. In goods issue processes *For Other Transactions*, the Inventory Management posting generates a **transfer requirement**. In the outbound delivery process, the transfer order refers to the **outbound delivery**.

2. What is the function of negative quants in the goods issue area?

Answer: B, C, D

The negative quant balances the total stocks in Inventory Management and Warehouse Management, and shows that stock removal has not been performed or is not yet complete.

3. During stock removal, how does the system determine a storage bin?

Answer: The system first determines the **issuing storage type**. Then it uses the stock removal strategy defined for this storage type to find **issuing storage bins**.

4. How can the picking area influence stock removal?

Answer:

1. One transfer order split can be performed for each picking area.
2. In a cross-transfer-order picking list, the items are sorted by picking area.

5. What factors influence shipping point determination?

Answer: C, D, E

The delivering plant, the shipping condition, and the loading group of the material influence shipping point determination.

6. Which basic dates are determined during shipment scheduling?

Answer: The system determines the material availability date, loading date, transportation planning date, and goods issue date.

7. Which factors play a part during picking location determination?

Answer: A, C, F

During picking location determination, the system takes account of the shipping point, delivering plant, and the storage condition (optional) of the material.

8. Lean Warehouse Management is

Answer: B, C, D

You use Lean Warehouse Management when you want to use transfer orders without storage bin management, for example, in order to exchange data with an external system.

9. How can you tell from the outbound delivery that a transfer order is required for picking?

Answer: If the *Picking* tab page displays an overall status of the transfer order and a warehouse number, then you must pick using a transfer order.

10. What is the message type **WMTA** used for?

Answer: Message type WMTA allows manual and/or automatic creation of transfer orders for outbound deliveries.

11. What does the completion type for the shipment type control?

Answer: The completion type controls the direction of the shipment.

12. What are the differences between single shipments and collective shipments?

Answer: A single shipment has exactly one point of departure and one destination.

13. Which types of shipment stages can be determined from the route?

Answer: The route can be used to determine legs, load transfer points, and border crossing points.

Unit 5

Packaging Logistics

Unit Overview

Logistics Execution enables you to model packaging processes as a substep of a logistics process in the SAP system. In addition to the packaging function, you will also become familiar with Handling Unit Management, a package management tool that can be implemented at any point in the logistics process.



Unit Objectives

After completing this unit, you will be able to:

- Make the required settings for packing at material master level
- Use the packing transaction in outbound deliveries
- Use the packing station
- Explain the term “handling unit”
- Describe the range of functions of Handling Unit Management
- Create a handling unit without reference to an object
- Use the Handling Unit Monitor

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Lesson: Packing

Lesson Overview

This lesson focuses on how to map packing in SAP ECC as a substep of the shipping process. The outbound delivery contains a **packing transaction** that you can use to construct packages (**handling units**). To be able to use the packing transaction functions, you must make settings at master data level and at Customizing level.



Lesson Objectives

After completing this lesson, you will be able to:

- Make the required settings for packing at material master level
- Use the packing transaction in outbound deliveries
- Use the packing station

Business Example

Packing of goods picked for outbound deliveries should be mapped in the system. The employees that perform this task at the packing station should be able to use scanners.

Presettings

During packing, material items in the outbound delivery are linked to **packaging materials**. Packaging materials are also managed in the system as materials with their own master records. You create these links in the **packing transaction** for the outbound delivery.

→ **Note:** When you create material master records for new packaging material, it is advisable to use material type *Packaging*. This material type contains several packing-relevant fields, such as maximum weight and maximum volume.

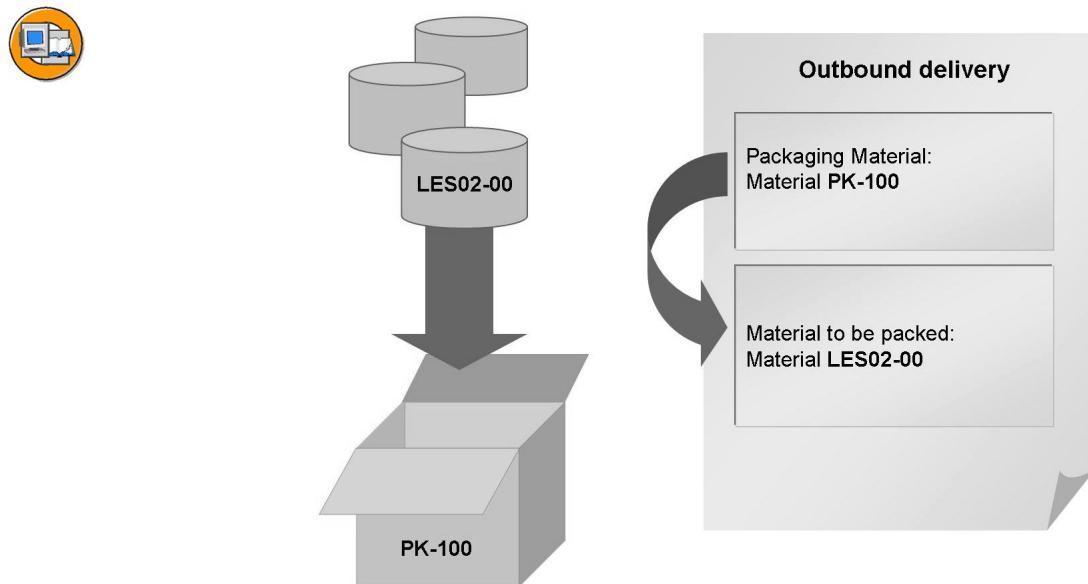


Figure 49: Packing in the Outbound Delivery

The system only allows as packaging materials those to which a **packaging material type** has been assigned in the master record. Packaging material types are defined in Customizing for Shipping. You group packaging materials according to their physical properties, such as boxes of a certain size, or pallets of a certain type.

→ **Note:** You assign packaging material types to the material record for a packaging material in the *Sales: General/Plant* view.

Materials to be packed can also be grouped together in the same way. To do this, you can use the **Material Group: Packaging Material**, which you create in Customizing for Shipping in the same way as the packaging material types. Material groups for packaging materials group together materials that should be packed in the same way.

→ **Note:** You enter the material group for packaging materials in the *Basic Data 1* view in the material master.

Packaging material types and material groups for packaging materials are assigned to each other in Customizing. Using these assignments as a basis, the system can check during packing whether the selected packaging material is allowed for the material to be packed. In the packing transaction, users can choose to display the packaging materials allowed for the material to be packed, and can then select a material from this list.

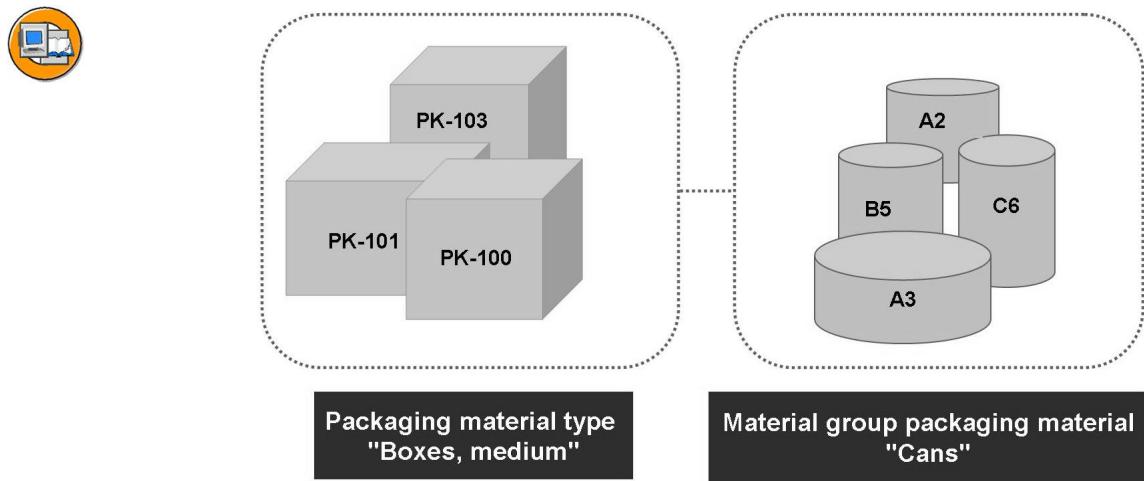


Figure 50: Packing-Related Groupings

In packing for the outbound delivery, you can construct several levels, for example, if goods to be packed should first be packed into boxes, and the boxes should then be packed onto a pallet. If, during packing, the system should check at the second level whether the selected packaging material is allowed, or if the user wants a system proposal for the packaging material, you must assign a separate material group for packaging materials to the packaging materials in the material master.

Functions in the Packing Transaction

In the outbound delivery, choose *Edit* in the packing transaction to access a screen divided into two parts; the upper half is for packaging materials or existing packages, the lower half is for the materials to be packed. In this screen area, the system automatically proposes the delivery items that can be packed.

→ **Note:** You specify the delivery item categories that can be packed, or that must be packed, in Customizing.

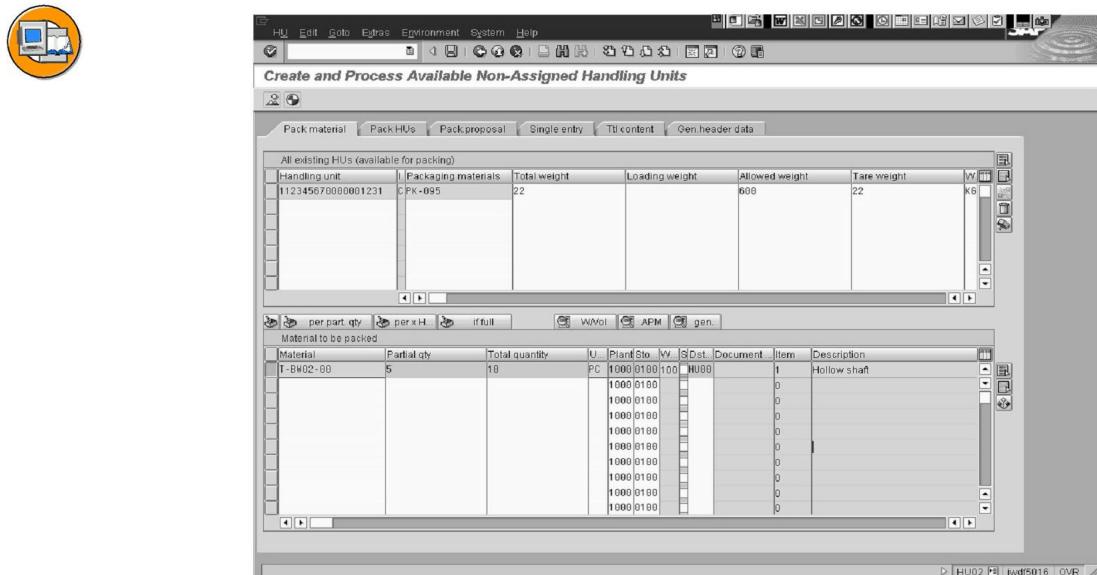


Figure 51: Packing Transaction

To define the packaging material of delivery items that require packing, you can either enter the material number, or - if you have made the relevant settings (see above) - select a material from a list of allowed packaging materials. Packing itself is assigning packaging materials to materials to be packed. There are three available options:

- Packing the largest possible quantity of the material to be packed
- New package for each partial quantity of the material to be packed
- Packing the total quantity of the material to be packed

If you choose the first option, the result is **one** package. The system packs the given quantity until the weight and volume tolerances defined in the material master are reached. The gross weight of the material to be packed is compared to the allowed packing weight for the packaging material. Remaining quantities are not packed. The other two options ensure that the total quantity of the material to pack is always packed. Either the user enters a partial quantity, or the system is permitted to distribute the total quantity. The system distributes the quantity as equally as possible. Where necessary, it also constructs a new package for any remaining quantities.

→ **Note:** The packing transaction contains similar options that enable you to pack packages further.

These procedures can be almost completely automated:

- You can store the customer's packing requirements as a **packing proposal** in the order, and can then tell the system to copy this automatically into the outbound delivery.
- If you want to standardize packing because certain materials are always packed in certain conditions in a certain way, you can create **packing instructions** as master data.

Handling Units Without Handling Unit Management

A package that you create in the packing transaction for the outbound delivery is described as a **handling unit** in the system. This term was introduced in SAP R/3 4.6C and replaces the previous term **shipping unit**. This renaming took place within the new development of **Handling Unit Management** (SAP R/3 4.6C), which is a package management tool that covers the entire logistics process. The range of functions of the shipping unit has been enhanced with package numbering according to international standards and the **packing station**.

→ **Note:** As of SAP R/3 4.6C, packages can be numbered according to EAN 128. In Customizing, you can set up automatic assignment of a Serial Shipping Container Code (SSCC).

Using the packing functions in the outbound delivery process does not mean that you implement Handling Unit Management. To be able to move packages across the entire process chain, you need to make various Customizing settings. Changes to the process control can have substantial consequences, particularly at Inventory Management level.

Some parts of the packing station functions (transaction HUPAST) correspond to the packing transaction in the outbound process. However, the packing station is designed for data entry using scanners, since it is aimed at users who perform packing and should spend as little time as possible working with on-screen data. A further advantage of the packing station is that you can connect computer-controlled **scales** to transfer the actual weight of a package to the SAP system. This option is particularly useful where the weight of the material to be packed changes, but the outbound delivery to the customer must contain an exact weight for each package.

→ **Note:** The scales are connected via a serial interface to the packing station worker's PC. The locally-installed program that controls the scales transfers the weights to the SAP-specific program "scale.exe", which is also installed on the PC. The connection between the SAP system and the scales is created using a Remote Function Call (RFC).

Exercise 18: Packing in the Outbound Delivery

Exercise Objectives

After completing this exercise, you will be able to:

- Pack material in the outbound delivery

Business Example

PC World Stuttgart KG orders four bases for flat screen monitors. These bases should be packed in padded cartons before being shipped.

Task:

Create a sales order, deliver the order, and pack the material to deliver in the outbound delivery.



Hint: To reduce the time needed for this exercise, no picking is performed.

- Create a standard order (**OR**) for four pieces of material **LES02-##** for customer **T-S11B##**.
- Deliver the order by choosing the follow-on function *Deliver*. Your shipping point has the key **X0##**.
- Display the allowed packaging materials in the packing transaction for the outbound delivery.
- Pack material **LES02-##** into packaging material **PK-100**.
- Before you save, check the overview screen for your outbound delivery.

Solution 18: Packing in the Outbound Delivery

Task:

Create a sales order, deliver the order, and pack the material to deliver in the outbound delivery.



Hint: To reduce the time needed for this exercise, no picking is performed.

1. Create a standard order (**OR**) for four pieces of material **LES02-##** for customer **T-S11B##**.
 - a) Choose *Logistics → Sales and Distribution → Sales → Order → Create*.
If the system does not make a suggestion, enter the *Order Type OR* and confirm with *Enter*.
 - b) Enter ordering party **T-S11B##** and any purchase order number in the relevant field on the overview screen. In the *Material* field, enter your material number **LES02-##**, and in the *Order Quantity* field, enter **4**. Do not save yet.
2. Deliver the order by choosing the follow-on function *Deliver*. Your shipping point has the key **X0##**.
 - a) From the order menu, choose *Sales Document → Deliver*. The system takes you directly to transaction VL01N (*Create an Outbound Delivery as a Single Document with Reference to a Sales Order*).
 - b) If the proposed selection date is today's date, move it forward by one week.
3. Display the allowed packaging materials in the packing transaction for the outbound delivery.
 - a) On the overview screen, choose *Edit → Pack*.
 - b) Select the material line and in the packing transaction choose *Extras → Allowed Packaging Material*.
4. Pack material **LES02-##** into packaging material **PK-100**.
 - a) Enter **1** in the *Partial Quantity* field.
 - b) Select the material and the handling unit and choose *Edit → Pack → New HU for Partial Qty of Material*. This results in four handling units.

Continued on next page

5. Before you save, check the overview screen for your outbound delivery.
 - a) Choose *Back* : A delivery item has been added for the packaging material.
 - b) Create the outbound delivery by choosing Save.

Exercise 19: Packing Station (Optional)

Exercise Objectives

After completing this exercise, you will be able to:

- Use the packing station as an alternative to the packing transaction in the outbound delivery

Business Example

PC World Stuttgart KG orders four bases for flat screen monitors. These bases should be packed in padded cartons before being shipped.

Task:

Create a sales order, deliver the order, and pack the material to deliver using the packing station, and not the method from exercise 1.

1. Create a sales order using the data from the first exercise (four pieces of material **LES02-##** for customer **T-S11B##**).
2. Deliver the order by choosing the follow-on function *Deliver*. Your shipping point has the key **X0##**.
3. Pick the goods for the outbound delivery by choosing *Follow-On Functions*.
4. Pack the shipping item at a packing station. If the system does not propose outbound delivery document number, you can use the input help for the *Delivery*.
5. Pack material **LES02-##** into padded box **PK-100**.
6. Call the outbound delivery again in change mode, and check the packing transaction to see if the handling units created at the packing station appear there, then post the goods issue.

Solution 19: Packing Station (Optional)

Task:

Create a sales order, deliver the order, and pack the material to deliver using the packing station, and not the method from exercise 1.

1. Create a sales order using the data from the first exercise (four pieces of material **LES02-##** for customer **T-S11B##**).
 - a) Choose *Logistics* → *Sales and Distribution* → *Sales* → *Order* → *Create*.
 - b) Enter order type **TA** and choose *Enter*.
 - c) Enter sold-to party **T-S11B##** and any purchase order number in the relevant field on the overview screen. Enter the material **LES02-##** and the quantity **4**.
2. Deliver the order by choosing the follow-on function *Deliver*. Your shipping point has the key **X0##**.
 - a) In the Order menu, choose *Sales Document* → *Deliver*.
 - b) If the proposed selection date is today's date, move it forward by one week.
3. Pick the goods for the outbound delivery by choosing *Follow-On Functions*.
 - a) In the outbound delivery, choose *Follow-On Functions* → *Create Transfer Order*.
 - b) In the *Foreground/Backgrnd* field, select the *Background* indicator and confirm with *Enter*.
 - c) Confirm the transfer order in the background. Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Outbound Delivery* → *Picking* → *Confirm Transfer Order* → *Single Document* → *In One Step*.
4. Pack the shipping item at a packing station. If the system does not propose outbound delivery document number, you can use the input help for the *Delivery*.
 - a) Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Outbound Delivery* → *Pack* → *Packing Station*.
 - b) Select the packing station type **PACK W/DELIVERY**.

Continued on next page

5. Pack material **LES02-##** into padded box **PK-100**.
 - a) Enter the outbound delivery document number in the *Delivery* field and confirm with *Enter*. The cursor moves to the *Handling Unit* field.
 - b) Enter the material number for the packaging material in this field. After you confirm this entry, the system creates an empty handling unit, into which you pack material **LES02-##**.
 - c) In the *Material/Handling Unit* field, enter the material number of your material to be packed (**LES02-##**). Confirm your input with *Enter* and in the *Quantity* field, enter the number of pieces to pack (**1**). The system informs you that the material has been packed.
 - d) From the menu, choose *Goto → Process Other HU* in order to pack further quantities of the material.
 - e) Pack the remaining three pieces of the material in the same way. Save your input.



Hint: When you save, the system updates the data in the outbound delivery.

6. Call the outbound delivery again in change mode, and check the packing transaction to see if the handling units created at the packing station appear there, then post the goods issue.
 - a) Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Outbound Delivery → Change → Single Document*.
 - b) To access the packing transaction in the outbound delivery, choose *Edit → Pack*.
 - c) Go back to the outbound delivery overview screen and choose *Post goods issue*.



Lesson Summary

You should now be able to:

- Make the required settings for packing at material master level
- Use the packing transaction in outbound deliveries
- Use the packing station

Lesson: Handling Unit Management

Lesson Overview

The aim of this lesson is to introduce the basic principles of Handling Unit Management, which is a tool for managing packages along the entire logistics process.



Lesson Objectives

After completing this lesson, you will be able to:

- Explain the term “handling unit”
- Describe the range of functions of Handling Unit Management
- Create a handling unit without reference to an object
- Use the Handling Unit Monitor

Business Example

IDES AG is looking for ways to map packages in the system, and move them across and throughout the entire supply chain.

Definition

A **handling unit** is a unit consisting of material to packed and packaging material that is uniquely identified by a number. It can be used in the entire logistics process and, if required, can also be used outside your own SAP system. This option of using handling units across processes constitutes the main difference between handling units and their “predecessors”, **shipping units**. A shipping unit is a unit that is generated by packing in the delivery. This means it can only be used in the delivery process.

→ **Note:** In SAP R/3 4.6C, the term *shipping unit* was replaced by *handling unit*. As a result, all units that are created by packing are called “handling units” in the system.

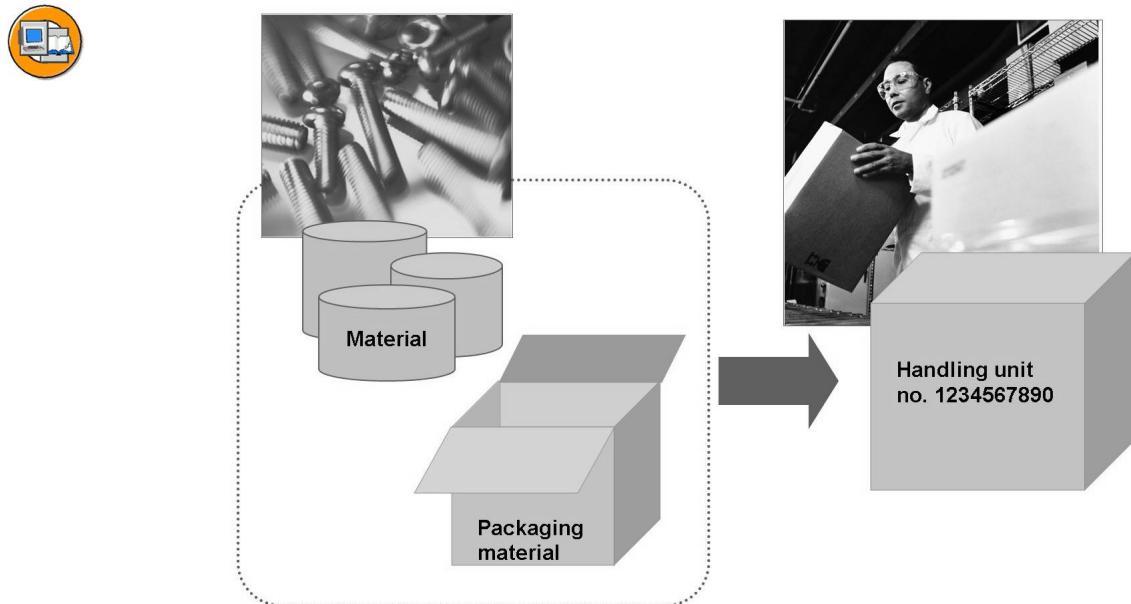


Figure 52: Handling Unit

Handling Unit Management was developed to simplify the technical system processing of logistics processes. Various material movements are performed with reference to packages. Usually, it is sufficient to enter the identification number of the handling unit. You can use this identification number at any time to call up detailed information about the contents and packaging. Each handling unit also has a “history”, in other words a cross-process, chronological documentation of all its movements.

The handling unit identification number can be unique either within a client, or across systems. If the number should only be unique at client level, number assignment is made according to number ranges. To uniquely identify the handling unit in the entire SAP system as well as outside the system boundaries, a **Serial Shipping Container Code (SSCC)** is used. The system also uses number ranges here, but with the addition of other elements.

→ **Note:** The SSCC is part of the coding standards **EAN 128** of European Article Numbering International. It is an eight-character number used to identify logistics units. The aim is to identify a package for at least one year worldwide, using its SSCC.

Consequences for Inventory Management

In contrast to the old shipping unit, the handling unit is the inventory management object (and not the material packed in it). This means that handling units are always inventory-managed in a separate **storage location**. This storage location is flagged in Customizing for Handling Unit Management as **subject to handling unit management**. This means that it can only take in packed stocks. Handling units

can only be stock in a handling unit storage location. A **partner storage location**, which is **not** subject to handling unit management, is assigned to each handling unit storage location. This structure is necessary because packing and unpacking in Handling Unit Management always cause storage-location-to-storage-location **posting changes**. The following figure illustrates this basic procedure:

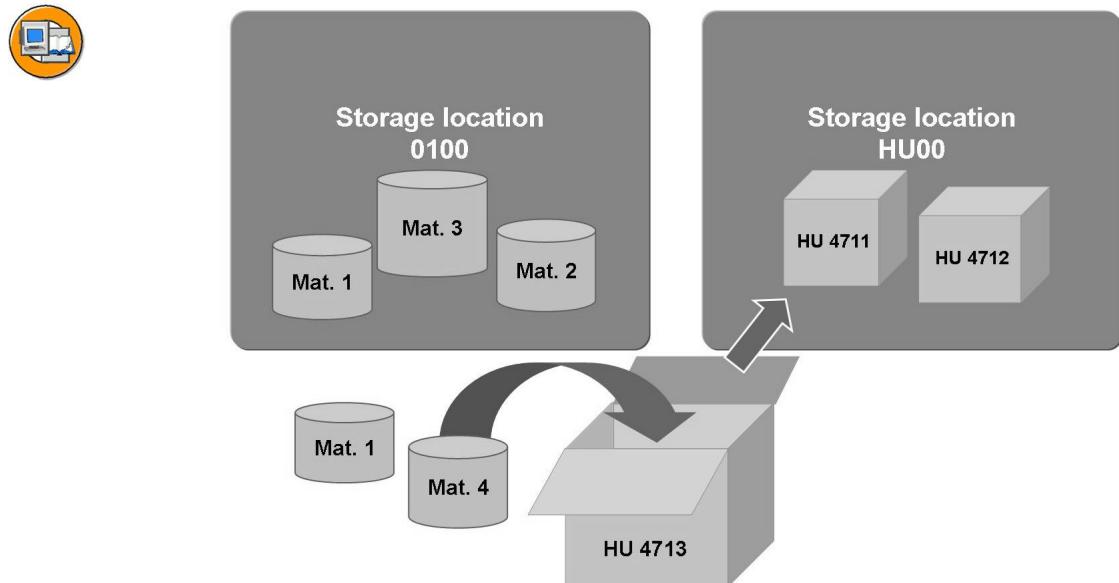


Figure 53: Packing and Unpacking as Posting Change Activities

When you pack an unpacked material, a posting change takes place from a non-handling-unit-managed storage location to a handling unit storage location. If you unpack a handling unit (or a partial quantity), the system transfer posts this material quantity into a non-handling-unit-managed storage location.

→ **Note:** The non-handling-unit-managed storage location does not necessarily have to be the partner storage location of the handling unit storage location. If there is no default storage location, the system uses the partner storage location.

For inventory management postings that affect packed material, you must always enter the handling unit involved. The posting must always refer to the total packed quantity.

Use in Logistics Process

Handling Unit Management is a package management tool that can be used throughout the logistics process. You can implement this solution in almost all Logistics subapplications in SAP ECC.

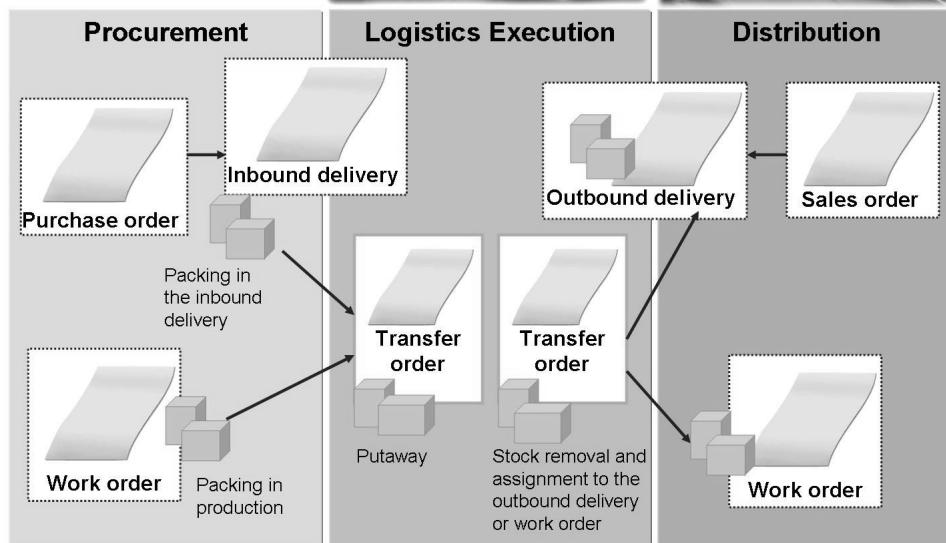


Figure 54: Process Overview

Goods procured externally are packed in the inbound delivery. However, you can also adopt packages from vendors as handling units in your own system, using their identification numbers.

→ **Note:** Goods receipt processes with handling units must be executed using inbound deliveries.

Material produced in-house is packed in production. You do not absolutely need to use the Warehouse Management system in connection with Handling Unit Management, but it is possible. Packages are put away using transfer orders.

You can supply Production with packed components. Here too, use of the Warehouse Management system is optional for material staging. If handling units should be delivered to customers, you need to at least be using Lean Warehouse Management if partial quantities have to be picked for the outbound delivery from existing handling units. If the picking storage location is subject to handling unit management, the system does not permit packing in the outbound delivery.

→ **Note:** However, if you are not using a Warehouse Management system, you can assign an entire existing handling unit to the outbound delivery.

Using a transfer order, a **pick handling unit** is created in advance for the material quantity to pick. When the transfer order is confirmed, the pick handling unit is assigned to the outbound delivery.

You can display handling units in the **Handling Unit Monitor** at any point in the logistics process, regardless of their usage. The monitor also allows you to make certain changes to handling units.



Creating a Handling Unit Without Reference to an Object

Prerequisites

Handling units are usually generated during the logistics process. However, you can also produce handling units by packing unpacked material outside a process.

Procedure

1. From the SAP menu, call up the packing transaction for free packing. Choose *Logistics → Central Functions → Handling Unit Management → Processing Handling Units → Create and Change (General)*.



Hint: Since packing is essentially a posting change from a non-handling-unit-managed storage location to a handling-unit-managed storage location, you must always enter the issuing and receiving storage locations.

2. On the *General Header Data* tab page, enter the plant and the issuing (non-handling-unit-managed) storage location. Go to the *Pack Material* tab page, and enter the material to pack, the quantity, and the receiving handling unit storage location.
3. Now choose a suitable packaging material from the list of allowed packaging materials, or enter a default packaging material. To display the list, select the material to be packed and choose *Extras → Allowed Packaging Material*.
4. To assign the packaging material and material to be packed to each other, choose one of the four buttons between the *Material to be packed* and *All existing HUs (available for packing)* areas.
5. To create the handling unit(s), save your data. The system informs you that the packing data was saved and that a material document has been created. This material document is evidence of the storage-location-to-storage-location posting change.

Exercise 20: Handling Unit Management

Exercise Objectives

After completing this exercise, you will be able to:

- Create a handling unit without reference to an object

Business Example

Your material warehouse contains unpacked pumps. You use Handling Unit Management, and want to pack some of these pumps in order to create handling units.

Task:

Pack two pumps onto one pallet to create a handling unit.

1. Check the stocks of material **T-H-##** in plant **1200**.
2. Pack two pieces of your material **T-H-##** onto one pallet (**PK-HUM**).



Hint: A handling unit should be created, which means that you must also enter the receiving handling unit **0005**.

3. Save the packing data. What information does the system give you? What is the reason for this?
4. Display your handling unit in the Handling Unit Monitor. Perform a selection using material number **T-H-##**.

Solution 20: Handling Unit Management

Task:

Pack two pumps onto one pallet to create a handling unit.

1. Check the stocks of material **T-H-##** in plant **1200**.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Total Stock per Material (Inventory Management)*.
 - b) Enter the material number **T-H-##** and the plant **1200**, and choose *Execute* . There are 20 pieces of the material in storage location **0001**. This storage location is not managed using handling units.
2. Pack two pieces of your material **T-H-##** onto one pallet (**PK-HUM**).



Hint: A handling unit should be created, which means that you must also enter the receiving handling unit **0005**.

- a) Choose *Logistics* → *Central Functions* → *Handling Unit Management* → *Processing Handling Units* → *Create and Change (General)*.
On the *General Header Data* tab page, enter plant **1200** and the issuing storage location **0001**. Delete any default values.
- b) On the *Pack Material* tab page, in the *Material to be packed* area, enter material number **T-H-##** and total quantity **2** in the relevant fields. In the *Destination Storage Location* column, enter the receiving handling-unit-managed storage location **0005**. Confirm your entries with *Enter*.
- c) Enter packaging material **PK-HUM** in the *All existing HUs (available for packing)* area, in the *Packaging Materials* field, and confirm by choosing *Enter*. The system assigns an identification number (according to *SSCC18*).
- d) Select the material line for the material to be packed and for the packaging material, and choose one of the two packing options *Pack* or *New HU If Full*. In the status line, you can see a message informing you that handling units have been created.

Continued on next page

3. Save the packing data. What information does the system give you? What is the reason for this?
 - a) The system informs you that a material document has been generated.
 - b) The material document is evidence of the storage-location-to-storage-location posting change, which the system performed when the handling unit was created.
4. Display your handling unit in the Handling Unit Monitor. Perform a selection using material number **T-H-##**.
 - a) Choose *Logistics → Central Functions → Handling Unit Management → Handling Unit Monitor*.
 - b) Choose the *Contents* tab page and select handling units using material number **T-H-##**. Choose *Execute* . The system displays your handling unit.



Lesson Summary

You should now be able to:

- Explain the term “handling unit”
- Describe the range of functions of Handling Unit Management
- Create a handling unit without reference to an object
- Use the Handling Unit Monitor



Unit Summary

You should now be able to:

- Make the required settings for packing at material master level
- Use the packing transaction in outbound deliveries
- Use the packing station
- Explain the term “handling unit”
- Describe the range of functions of Handling Unit Management
- Create a handling unit without reference to an object
- Use the Handling Unit Monitor



Test Your Knowledge

1. What is a packaging material type?

2. The packing station can be used as an alternative to the packing transaction in the delivery.

Determine whether this statement is true or false.

- True
 False

3. What is the difference between a handling unit and a shipping unit?

4. What does SSCC stand for, and what does this term mean?



Answers

1. What is a packaging material type?

Answer: A packaging material type is a category, defined in Customizing, that groups packaging materials according to their physical properties, for example, pallets with a certain size.

2. The packing station can be used as an alternative to the packing transaction in the delivery.

Answer: True

The packing station can be used as an alternative to the packing transaction in the delivery. It is particularly suited for data entry using scanners.

3. What is the difference between a handling unit and a shipping unit?

Answer:

- The handling unit itself is the inventory management object.
- It can be used throughout the entire logistics process.

4. What does SSCC stand for, and what does this term mean?

Answer: SSCC is the abbreviation for **Serial Shipping Container Code**. It is an internationally valid code for the identification of packages.

Unit 6

Additional Functions in Warehouse Management

Unit Overview

In Logistics Execution, several additional functions are available in Warehouse Management. This unit will introduce a selection of these additional functions.



Unit Objectives

After completing this unit, you will be able to:

- Describe the range of functions of the warehouse activity monitor
- Use the warehouse activity monitor to monitor warehouse processes
- Use the bin status report, indexes of empty storage bins, and capacity evaluations
- Name the uses of mobile data entry
- Describe the radio frequency (RF) solution in SAP ECC
- Use the RF monitor
- Explain the functions of cross-docking
- Describe possible scenarios in cross-docking
- Explain the basic functions of TRM
- Describe the goods movement process in TRM

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Lesson: Warehouse Activity Monitor and Other Evaluations

Lesson Overview

SAP ECC offers various tools for monitoring and evaluating warehouse stocks and movements. In this lesson you will learn about the warehouse activity monitor and other standard analyses and stock overviews.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the range of functions of the warehouse activity monitor
- Use the warehouse activity monitor to monitor warehouse processes
- Use the bin status report, indexes of empty storage bins, and capacity evaluations

Business Example

In order to rapidly recognize errors or problems in the warehouse, IDES AG uses the warehouse activity monitor. In addition, regular checks of the stocks and material flow are also required.

Warehouse Activity Monitor

The **warehouse activity monitor** is a tool for monitoring warehouse movements and stocks. It aims to provide timely information about processes that are either incomplete or running incorrectly. It also allows you to create and/or correct documents, and perform postings. The warehouse activity monitor contains seven **objects** that are used for monitoring:



1. Unconfirmed transfer orders
2. Open transfer requirements
3. Open posting change documents
4. Open deliveries
5. Negative stocks
6. Stocks in interim storage types
7. Critical stocks in production storage bins

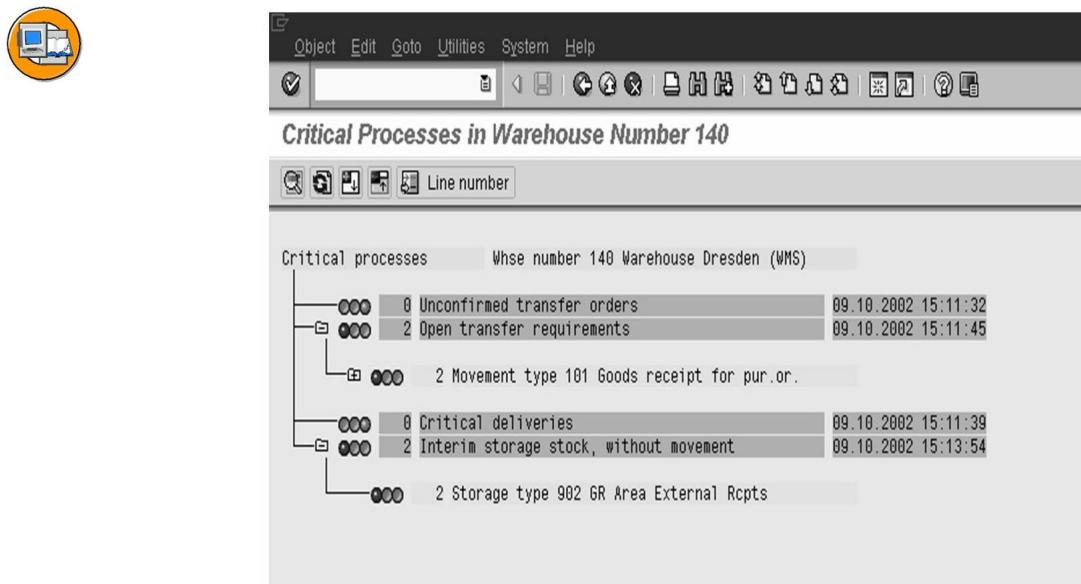


Figure 55: Warehouse Activity Monitor

You define processing deadlines for each of these objects in Customizing. This means that the warehouse activity monitor only displays a document or a stock if these deadlines have not been met. Each object has a corresponding report. You can create variants of these reports. You can also schedule the reports as jobs in order to regularly check both documents and stocks.

The reference organizational unit for the warehouse activity monitor is always the **warehouse number**. If the system is processing the object **Unconfirmed Transfer Orders**, it searches for transfer orders that were not confirmed within the deadline specified in Customizing. The selection is restricted in Customizing to certain movement types and, if required, to certain storage types. The check for the objects **open transfer requirement** and **open posting change notices** works in a similar way. If no transfer orders were created for the documents within the specified period, they appear in the warehouse activity monitor.

Note: Posting change documents and transfer requirements have the same function: They document an Inventory Management posting, and are reference documents for the transfer order. Posting change notices are usually the result of posting changes in Inventory Management, for example, which change the stock type, assignment to special stock, or the batch of a material quantity. Usually, a transfer order is needed to inform the Warehouse Management system which quants are affected by the changes.

If the system checks the warehouse activity monitor object **Open Deliveries**, it searches for outbound deliveries with warehouse-management-relevant items that do not yet have the overall transfer order status **C (Completely Processed)**. The deadlines you specify in Customizing for this object are always valid with regards

to the dates for specific shipping activities. The system determined these dates when the order was created, and then copied them into the outbound delivery. This means that if you start the selection report for the object, the system compares the planned time from the outbound delivery with the report time. It uses the deadline from Customizing to see whether there is enough time remaining to complete the shipping activities.

- **Note:** The value for wave pick processing for the warehouse number decides whether the system uses the material availability time, loading time, or goods issue time for the comparison. If these other values are missing, the loading time is the reference factor.

Negative stocks and stocks in interim storage types are only displayed in the warehouse activity monitor after a deadline specified in Customizing. The object for **critical stocks in production storage bins** was created in order to monitor variances between transfer requirement quantities in the work order and the transfer requirement used to stage the material for production.

- **Note:** This object is only relevant if production is supplied with material from the warehouse.

Stock Overviews and Evaluations

The Warehouse Management system offers various stock overviews, in addition to evaluations from different standpoints. The overviews of **storage bin stocks** are essential for daily work in the warehouse. Here you can choose between an overview of the entire stock of a material in a warehouse number (transaction LS26), and a material-specific bin stock overview (transaction LS24). The advantage of the first overview is that you can see immediately whether stocks are being moved. The structure of the overviews is otherwise identical.

- **Note:** Transaction LS24 leads you directly to a list of all storage bins that contain the selected material.

Another useful tool is the **bin status report** (transaction LX03), which gives you an overview of various stocks in a warehouse or in individual storage types. From the bin status report, you can display individual storage bins and quants.

- **Note:** You can adapt these stock overviews to your own requirements using the **SAP List Viewer**. You can hide columns that do not interest you, while showing others. The exercises in this lesson will show you how to work with this function.



Bin stat.rep: Overview									
Warehouse number 100									
Type	Stor_bin	Material	Plnt	Batch	C	S	Special stock number	TIL	
002	01-01-01	T-BW04-00	1000					793	
002	01-01-02	T-BW04-00	1000					793	
002	01-01-03	T-BW04-00	1000					793	
002	01-01-04	T-BW04-00	1000					793	
002	01-01-05	T-BW04-00	1000					793	
002	01-02-01	T-BW04-00	1000					793	
002	01-02-02	T-BW04-00	1000					793	
002	01-02-03	T-BW04-00	1000					793	
002	01-02-04	T-BW04-00	1000					793	
002	01-02-05	T-BW04-00	1000					793	
002	01-03-01	T-BW04-00	1000					793	
002	01-03-02	T-BW04-00	1000					793	
002	01-03-03	T-BW04-00	1000					793	
002	01-03-04	T-BW04-00	1000					793	
002	01-03-05	T-BW04-00	1000					793	
002	01-04-01	T-BW04-00	1000					793	
002	01-04-02	T-BW04-00	1000					793	
002	01-04-03	T-BW04-00	1000					793	
002	01-04-04	T-BW04-00	1000					793	
002	01-04-05	T-BW04-00	1000					793	
002	01-05-01	T-BW24-00	1000					128	
002	01-05-02	T-BW24-00	1000					128	
002	01-05-03	T-BW24-00	1000					128	
002	01-05-04	T-BW24-00	1000					128	

Figure 56: Bin Status Report

If you are using fixed bin storage, you can analyze fixed bins and their stocks using a separate report, the **fixed bin information list** (transaction LX29). For example, the system checks whether there are fixed bins that were not yet assigned to a material master, or whether materials are contained in a different fixed bin than specified in the material master. You can also specifically select all the empty bins in a storage type (transaction LS04).

→ **Note:** You can find other evaluations, such as document overviews for transfer requirements and transfer orders, or analyses for inventories in Warehouse Management, under *Information System* in the Logistics Execution area menu. This menu also contains the standard analyses for warehouse controlling (evaluations of material and quantity flows).

Exercise 21: Warehouse activity monitor

Exercise Objectives

After completing this exercise, you will be able to:

- Use the warehouse activity monitor

Business Example

You need to check whether all putaway and stock removal activities were completed within the planned time.

Task:

Call up the warehouse activity monitor and complete any missing process steps.

1. Call up the warehouse activity monitor for your warehouse number **1xx** with variant **LES001**.
2. Make the system check all four objects for the variant. To do this, you must update the data.



Caution: It is not sufficient to simply choose *Refresh* . You must tell the system to update the data by choosing *Edit → Determine data again*.

3. Display the details for the first critical object (open transfer requirements). Create the transfer orders for these transfer requirements in the background.
4. Return to the object overview. Display the details for the interim storage type stocks and process the open activities.

Solution 21: Warehouse activity monitor

Task:

Call up the warehouse activity monitor and complete any missing process steps.

1. Call up the warehouse activity monitor for your warehouse number **1xx** with variant **LES001**.
 - a) Choose *Logistics* → *Logistics Execution* → *Information System* → *Warehouse* → *Warehouse Activity Monitor*.
 - b) Enter your warehouse number **1xx** and the variant **LES001**, and choose *Execute* .
2. Make the system check all four objects for the variant. To do this, you must update the data.



Caution: It is not sufficient to simply choose *Refresh* . You must tell the system to update the data by choosing *Edit* → *Determine data again*.

- a) Place the cursor on the first object and choose *Edit* → *Determine data again*.
 - b) Choose *Yes* on the confirmation prompt. The system updates the data.
 - c) Repeat this process for the other three objects. Afterwards, you should have two critical transfer requirements, and the corresponding critical interim storage type stocks (red traffic light symbol next to the objects affected).
3. Display the details for the first critical object (open transfer requirements). Create the transfer orders for these transfer requirements in the background.
 - a) Select the object and choose *Detailed Display* .
 - b) Select the documents and choose *Create TO in Background*. The system creates two transfer orders.

Continued on next page

4. Return to the object overview. Display the details for the interim storage type stocks and process the open activities.
 - a) Select the object *Interim storage stock, without movement* and choose *Detailed Display* .
 - b) Since the transfer orders for putting these stocks away were already created in step 3, you can display the documents by choosing *Transfer Orders for Quant.*
 - c) Confirm the transfer orders from this screen by placing the cursor between the bin coordinates and the target quantity and choosing *Confirmation in Background* .



Hint: The system displays the next transfer order if you exit the document display after confirming the document.

- d) Refresh the display by choosing *Refresh* .

Exercise 22: Adapting the Bin Status Report Using the SAP List Viewer (Optional)

Exercise Objectives

After completing this exercise, you will be able to:

- Adapt the Bin Status Report using the SAP List Viewer

Business Example

The Bin Status Report should be adapted to individual requirements. For example, in the future the report should also show the storage sections.

Task:

Use the SAP List Viewer to adapt the Bin Status Report so that you can see specific additional information.

1. Call up the Bin Status Report for your warehouse number **1xx**.
2. Choose Current Layout in order to select fields that were previously hidden.



Hint: You can start editing the layout by choosing *Current Layout*

3. Save your new variant so that you can use it again later.



Hint: When you call up the Bin Status Report again, you can select your layout on the selection screen.

Solution 22: Adapting the Bin Status Report Using the SAP List Viewer (Optional)

Task:

Use the SAP List Viewer to adapt the Bin Status Report so that you can see specific additional information.

1. Call up the Bin Status Report for your warehouse number **1xx**.
 - a) Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Bin Status Report*.
 - b) Enter your warehouse number **1xx** and choose *Execute* .
2. Choose Current Layout in order to select fields that were previously hidden.



Hint: You can start editing the layout by choosing *Current Layout* .

- a) Select some of the hidden fields, such as *Storage Section* or *Storage Bin Type* and choose *Show selected fields* .



Hint: To search for specific fields using their short text, choose *Find* .

- b) Finish adapting the report by choosing *Copy*. The selected fields now appear as additional columns in the current Bin Status Report.



Hint: You can also change the position and width of these columns using the SAP List Viewer.

3. Save your new variant so that you can use it again later.



Hint: When you call up the Bin Status Report again, you can select your layout on the selection screen.

- a) Choose *Settings* → *Layout* → *Save Layout*.
- b) Enter a name for your layout, such as **SCM601-##**, and enter any description for the variant. Choose *Save*.



Lesson Summary

You should now be able to:

- Describe the range of functions of the warehouse activity monitor
- Use the warehouse activity monitor to monitor warehouse processes
- Use the bin status report, indexes of empty storage bins, and capacity evaluations

Lesson: Mobile Data Entry

Lesson Overview

This lesson provides an overview of the range of functions in the solution for Mobile Data Entry (MDE) in warehouses that is integrated in the standard SAP ECC system.



Lesson Objectives

After completing this lesson, you will be able to:

- Name the uses of mobile data entry
- Describe the radio frequency (RF) solution in SAP ECC
- Use the RF monitor

Business Example

For cost reasons, IDES AG wants to cut down on paperwork as much as possible. Putaway and stock removal operations should be reported using scanners.

Introduction

Mobile data entry is becoming more commonplace in warehouse management. Material and storage bin data are entered using a bar code scanner, and are checked by the system. The advantages of this procedure are obvious:

- Reduced error rate, because usually it is not possible to enter data manually
- Increased processing speed
- Constantly up-to-date stock information
- Rapid training of new or temporary employees, since no previous knowledge is required.

The warehousing mobile data entry solution available within Logistics Execution is based on **radio frequency** (RF) technology. Users enter data directly into the SAP system using data frequency terminals, available as either hand-held devices or as forklift terminals for mounting on vehicles. These terminals usually consist of a display and a keyboard with an integrated bar code reader. There are also devices available that use touch screen technology. Size, weight, details, and prices vary depending on manufacturer and model.

 **Note:** The RF solution in SAP ECC is not specific to any hardware. This means you can use products from most manufacturers.

Functions

Mobile data entry in Logistics Execution supports two types of radio frequency terminals:

- Devices with **graphical** user interfaces
- Devices with **text-based** user interfaces

Terminals with graphical user interfaces use the **SAP Graphical User Interface** (SAP GUI) for Microsoft Windows. GUI devices are connected to SAP ECC. The screen display and size of the processing transactions is adjusted to the current device functions, and allows the use of function buttons or pushbuttons.

 **Note:** The SAP GUI is a program that connects a front end computer to a specific SAP system. It is the standard point of access to most SAP solutions.

If you want to use terminals with a text-based user interface, you need to use an interface that can convert text displays into graphical displays, and vice versa. For this reason, standard SAP ECC systems are shipped with a suitable standard SAP interface: the **SAPConsole**. It runs on the Microsoft Windows NT or Windows 2000 platform. The connection to the hardware supplier's subsystem is made using **Telnet**.

 **Note:** Telnet is a program for making connections to any computer within a network, in order to execute programs on this computer without a graphical interface.

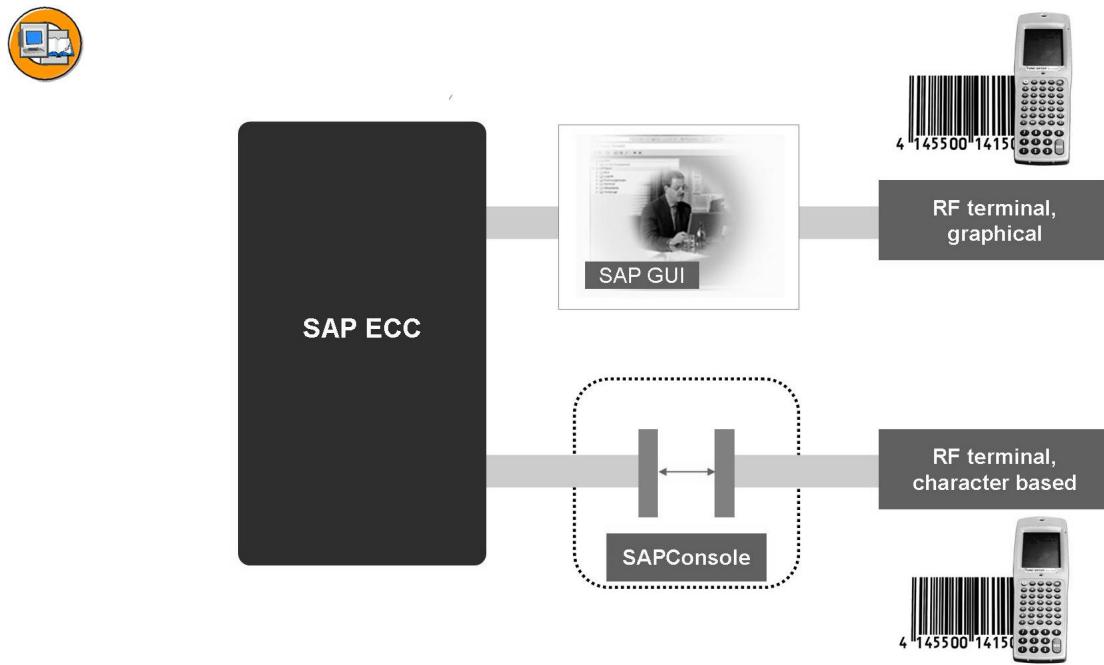


Figure 57: Mobile Data Entry: Connection

Mobile data entry is an integrated solution, available as of SAP R/3 4.6B.

Use in Warehouses

The transactions for running the RF solution that are shipped with the standard SAP ECC system are designed for use within the Warehouse Management system. They cover nearly all putaway and stock removal operations, and can also be used to pack, load, and inventory stocks. Yet it is relatively easy to enhance the solution by including additional functions.

→ **Note:** Customizing allows for user-specific screen and menu management, for example, adjusting the size of the screen display and assigning specific transactions. There are also several available user exits for screen control. If required, you can also program new transactions using ABAP. This means that the RF solution could be used outside the Warehouse Management system, if needed.

In Customizing for Mobile Data Entry, you define **queues**, which are working groups that consist of similar activities grouped together. In this way, for example, you can create a queue for the goods receipt or for the goods issue. These queues are assigned to both users and to documents to be processed. You can monitor the

relationship between users and documents in the **radio frequency monitor**. If the relationship is out of balance, you can move users and documents from one queue to another using “Drag&Drop”.

- **Note:** A traffic light icon helps you to recognize overloads immediately. In Customizing, you define the relationship between user and workload, specifying when the system should view the relationship as critical or not balanced.

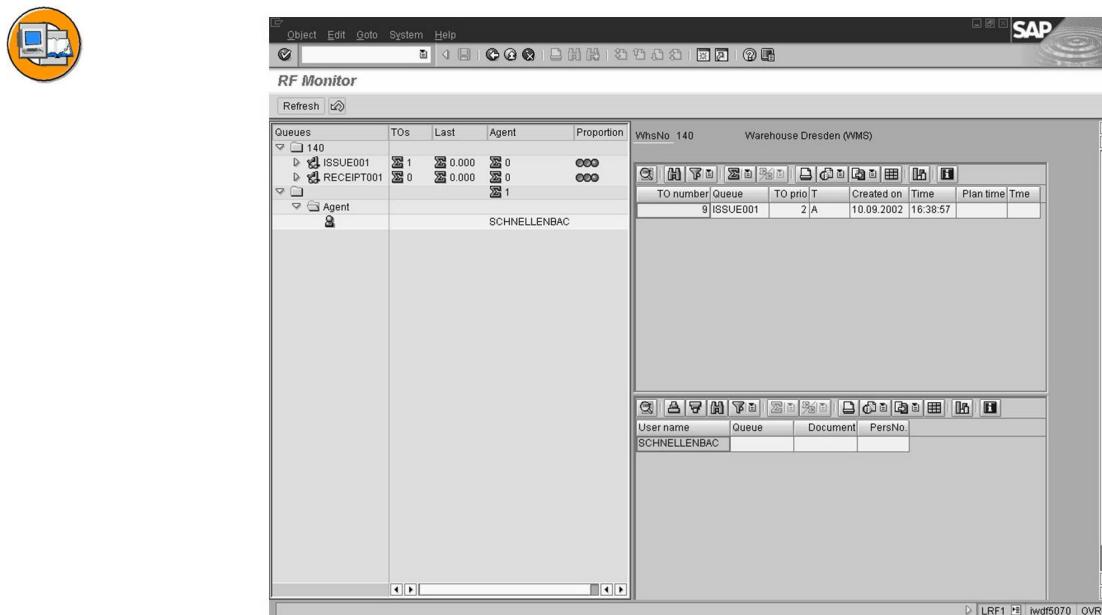


Figure 58: Radio Frequency Monitor

Depending on the default settings, warehouse employees can select documents to process using the document number (for example, from deliveries), or can work under “guidance”. This means that the system proposes the next document in their queue for processing.

The standard system supports all current bar code types, and permits the use of application identifiers (AI).

- **Note:** Application identifiers are part of the UCC/EAN coding standards. They are prefixes that flag the meaning and format of their subsequent codes. For example, AI 10 describes a batch number with up to 20 characters.

Under certain circumstances, you can use **interleaving** to optimize processes in the warehouse. In this process, for example, a user who has performed a putaway is assigned a stock removal for their return journey in order to reduce the number of empty runs and deadheading.

There are separate RF transactions available for Handling Unit Management.

The procedures described below outline only a few of these transactions. The SAP Library contains step-by-step documentation about putaway, stock removal, packing, loading, and identification operations.



Lesson Summary

You should now be able to:

- Name the uses of mobile data entry
- Describe the radio frequency (RF) solution in SAP ECC
- Use the RF monitor

Lesson: Cross-Docking

Lesson Overview

In some cases, it is not useful to store materials as soon as they arrive from the vendor or production. If customers frequently need stock material delivered at short notice, it makes more sense to pick goods directly from the goods receipt zone for one or more outbound deliveries.



Lesson Objectives

After completing this lesson, you will be able to:

- Explain the functions of cross-docking
- Describe possible scenarios in cross-docking

Business Example

Since IDES AG often has to deliver stock material to customers at short notice, it checks the cross-docking options within Warehouse Management in SAP ECC.

Purpose

Cross-Docking (LE-WM-CD) is a subfunction of Warehouse Management in Logistics Execution that can be used if you want to pick goods directly from the goods receipt zone after they have arrived from the vendor or production, rather than in each case storing the goods first and then removing them again from stock.

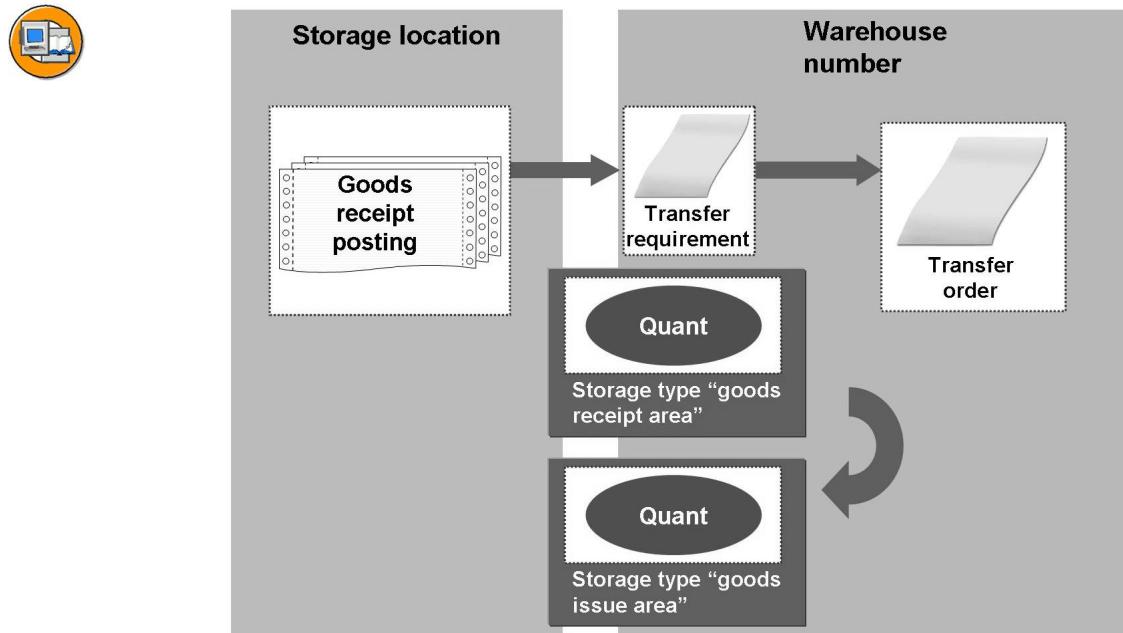


Figure 59: Cross-Docking During Receipt of Goods with Transfer Requirement

In SAP ECC, you can **plan** cross-docking. In other words, before the goods arrive, you can arrange for them to be assigned to a specific outbound delivery and thus picked directly on arrival. However, you can also make a similar **cross-docking decision** if the delivered goods are already in the goods receipt zone. The system manages your decision in the **cross-docking monitor**, which you can also use to assign goods receipts to goods issues manually. The system reports overdue processes and other errors in the **alert monitor**. You can use this monitor to access a current process and quickly deal with any errors.

During the cross-docking process in Logistics Execution, documents that can directly link goods receipt and goods issue processes are divided into **planning documents** and **candidate documents**. A planning document can be a transfer requirement, an inbound delivery, or an outbound delivery. The system checks whether a suitable cross-docking partner for the planning document exists in the form of a candidate document, in order to assign it to the planning document, if necessary. This check is always performed in relation to items.

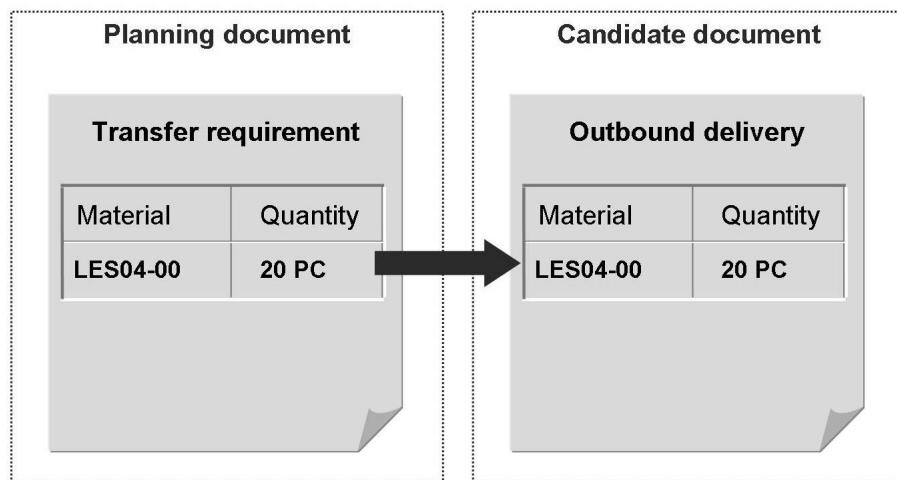


Figure 60: Planning Document and Candidate Document

If you choose the **planning direction** “Inbound to Outbound”, for example, the system checks whether for an inbound delivery planning document, an outbound delivery has already been created whose planning requirement can fully or partially cover this inbound delivery. In this scenario, the outbound delivery is the candidate document, in other words, the document whose items can be linked with the planning document items. The cross-docking decision updates this link in the system. If the planning direction is “Outbound to Inbound”, the planning document and candidate document change roles: The outbound delivery is now the planning document, and the inbound delivery and transport requirements are potential candidate documents.

Types of Cross-Docking Processes

Logistics Execution offers two basic forms of cross-docking:



- Planned cross-docking
- “Opportunistic” cross-docking

During the **planned** cross-docking process, you make cross-docking decisions **prior** to the arrival of incoming stock and release of outgoing documents that are most likely to affect new incoming stock. “Release” in this context means the creation of a transfer order for outbound delivery. If you are therefore planning cross-docking for an outbound delivery, the stock removal transfer order for this outbound delivery must not yet have been created. In the cross-docking monitor, the system provides you with cross-docking links between inbound and outbound documents, from which you can make cross-docking decisions. You can also,

however, run the cross-dock planning in the background and accept cross-docking decisions recommended by the system. As a result, you can execute cross-docking planning manually or with system guidance.

→ **Note:** Within the planned cross-docking process, the system optimizes the assignment of inbound and outbound documents on the basis of quantities. In the cross-docking monitor, you can choose the optimization levels: delivery/transfer requirement, shipment, or group.

With “**opportunistic**” cross-docking, the system operates independently. This type of cross-docking always takes place **after** the arrival of the incoming stock or release of the outgoing document, and when the transfer order is created. The system cancels any items of transfer orders that previously existed, in order to generate a cross-docking. If you are working with inbound deliveries, the goods receipt must be posted in connection with the transfer order confirmation (indicator 4 in the *Adopt Putaway Quantity* field) or - if you are using Handling Unit Management - before the transfer order is created.

Cross-docking in Logistics Execution can be performed in one or two steps. During **one-step** cross-docking, the stock removal transfer order moves stock directly from the goods receipt zone. In the standard SAP system, the source storage type of stock removal is usually **902** and the destination storage type is the respective goods issue area, for example, storage type **916**. The “opportunistic” cross-docking process is always one step. Planned cross-docking can however also be **two step**, whereby goods are moved from the goods receipt zone to a cross-docking storage type (first transfer order) first. When the second transfer order is created, the system moves stock from this storage type during stock removal. If the planning document and candidate document cannot be assigned immediately or is not required, you can **determine** cross-docking for a document initially in a two-step procedure. For example, if cross-docking for a goods receipt transfer requirement is performed in this way, the system determines the cross-docking storage type as destination storage type for putaway when the transfer order is created.

Exercise 23: Planned Cross-Docking

Exercise Objectives

After completing this exercise, you will be able to:

- Execute planned cross-docking

Business Example

In some cases, it is not useful to store materials as soon as they arrive from the vendor or production. If customers frequently need stock material delivered at short notice, it makes more sense to pick goods directly from the goods receipt zone for one or more outbound deliveries.

Task:

Your customer **T-S11B##** orders 48 pieces of material **LES02-##**. In turn, you have ordered 120 pieces of the same material from vendor **1000**. After the goods have arrived, post the goods receipt for your purchase order. With the help of cross-docking, stock from the goods receipt zone should now be delivered immediately to your customer.



Hint: If you receive an error log with the message *No schedule lines due for delivery up to selected date.*, move the selection date forward by about one week.

1. Create an order with the order type **OR** for customer **T-S11B##** for 48 pieces of material **LES02-##** and deliver the order.
2. Create a purchase order for 120 pieces of material **LES02-##** for plant **1200** and the storage location **01xx**. Order from vendor **1000**. Make a note of the purchase order document number and then post the goods receipt for this order.

Enter the following data at header level:

Purchasing organization	1000
Purchasing group	000
Company code	1000

Purchase order: _____

3. Check the stock overview for your material **LES02-##**. Which storage type contains the quant?

Continued on next page

4. Now plan cross-docking for both activities. To do so, call up the cross-docking monitor for your warehouse number **1xx**. Let the outbound deliveries be selected that will be picked in the next two weeks. You want to check the system proposals first, before you make a cross-docking decision.
5. Now create the transfer order for the transfer requirement from step 2 of the exercise in the foreground. Which destination storage type does the system propose for putaway? Then confirm the transfer order.
6. Finally, check the outbound delivery. What is the status of the document now?

Solution 23: Planned Cross-Docking

Task:

Your customer **T-S11B##** orders 48 pieces of material **LES02-##**. In turn, you have ordered 120 pieces of the same material from vendor **1000**. After the goods have arrived, post the goods receipt for your purchase order. With the help of cross-docking, stock from the goods receipt zone should now be delivered immediately to your customer.



Hint: If you receive an error log with the message *No schedule lines due for delivery up to selected date.*, move the selection date forward by about one week.

1. Create an order with the order type **OR** for customer **T-S11B##** for 48 pieces of material **LES02-##** and deliver the order.
 - a) Choose *Logistics → Sales and Distribution → Sales → Order → Create*. Enter the order type **OR (Standard Order)** and confirm your entries by choosing *Enter*.
 - b) Enter the following data and confirm these entries with *Enter*.

Sold-To Party	T-S11B##
PO number	SCM601-##
Material	LES02-##
Order quantity	48

- c) From the menu, choose *Sales Document → Deliver*. Create the outbound delivery by choosing *Save*.
2. Create a purchase order for 120 pieces of material **LES02-##** for plant **1200** and the storage location **01xx**. Order from vendor **1000**. Make a note of the purchase order document number and then post the goods receipt for this order.

Enter the following data at header level:

Purchasing organization	1000
Purchasing group	000
Company code	1000

Continued on next page

Purchase order: _____

- a) Choose *Logistics → Materials Management → Purchasing → Purchase Order → Create → Vendor/Supplying Plant Known*. Enter vendor **1000**, purchasing organization **1000**, purchasing group **000**, and company code **1000**. Choose *Enter* to confirm your entries.
 - b) Now enter material **LES02-##**, quantity **120**, as well as plant **1200** and storage location **01xx**. Create the purchase order by choosing save.
 - c) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order; Order; Other Transactions → Enter Goods Receipt for Purchase Order*. In the yellow field to the right of the *Purchase Order* field, enter the purchase order number from the last step and choose *Enter* or *Execute* .
 - d) In the detail data, set the *Position OK* indicator (lower edge of the screen) and save your input to post the goods receipt.
3. Check the stock overview for your material **LES02-##**. Which storage type contains the quant?
- a) Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Total Stock per Material (Warehouse Management)*.
 - b) Enter your warehouse number **1xx**, material **LES02-##**, and choose *Enter*.
 - c) In the goods receipt zone (storage type **902**) the system shows 120 pieces of the material as available stock.
4. Now plan cross-docking for both activities. To do so, call up the cross-docking monitor for your warehouse number **1xx**. Let the outbound deliveries be selected that will be picked in the next two weeks. You want to check the system proposals first, before you make a cross-docking decision.
- a) Choose *Logistics → Logistics Execution → Cross-Docking → Cross-Docking Monitor*. Enter your warehouse number **1xx**.
 - b) Choose the *Outbound Delivery* tab page. Move the selection date forward in the *Picking Data - to* field by two weeks.
 - c) Choose *Planning*: The system proposes a cross-docking link between your inbound transfer requirement and your outbound delivery.
 - d) Select the entries for planning document and candidate document and choose *Add to Plan*: The system adds an entry in the lower third of the screen in the *Selected Plan* area.
 - e) Select this entry and choose *Save*  (directly above the text *Selected Plan*). Exit the link screen.

Continued on next page

5. Now create the transfer order for the transfer requirement from step 2 of the exercise in the foreground. Which destination storage type does the system propose for putaway? Then confirm the transfer order.
 - a) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Create Transfer Order → For Material*. Enter your warehouse number **1xx**, material **LES02-##**, and choose *Enter*.
 - b) Select your transfer requirement and choose *TO in Foregr.*.
 - c) Choose *Putaway Foreground* : The system proposes to “putaway” the first quant in the goods issue area, storage type **916**. Confirm the proposal by choosing *Enter*: The second quant is also intended for the goods issue area. Let the system generate the remaining documents items and create the transfer order by choosing save.
 - d) Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Display Transfer Order → For Material*.
 - e) Enter your warehouse number **1xx**, your material number **LES02-##**, and choose *Execute* .
 - f) Click the transfer order number in the first line and from the menu choose *Transfer Order → Confirm in backgrnd*.
6. Finally, check the outbound delivery. What is the status of the document now?
 - a) Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Outbound Delivery → Change → Single Document*. The document number of your outbound delivery is usually proposed by the system. Confirm by choosing *Enter* to return to the overview screen for the document.
 - b) The *Overall pick.status* and the *Overall WM status* both have the value C. You can now post the goods issue for the outbound delivery.



Lesson Summary

You should now be able to:

- Explain the functions of cross-docking
- Describe possible scenarios in cross-docking

Lesson: Task and Resource Management

Lesson Overview

Task and Resource Management (TRM) extends Warehouse Management functions in Logistics Execution to include optimization tools. This lesson contains an introduction to using TRM in goods receipt and goods issue processes.



Lesson Objectives

After completing this lesson, you will be able to:

- Explain the basic functions of TRM
- Describe the goods movement process in TRM

Business Example

IDES AG is examining how TRM optimizes processes within Warehouse Management.

Basic Functions of Task and Resource Management

TRM is based on a three-dimensional representation of the spatial factors of a warehouse complex in the SAP system using geocoordinates. Movements between two or more points within the warehouse are determined in the recorded routes. Employees, vehicles, and devices are defined as resources whose capabilities are determined in more detail by specific criteria.



Caution: A route in TRM should not be confused with a route in delivery and transportation processing in Logistics Execution.

TRM therefore extends the Warehouse Management functions in Logistics Execution to include key optimization processes. The system can determine resources to execute each task and provide the resources with the optimal route to reach their destination. Actions can usually be initiated manually using the TRM monitor.

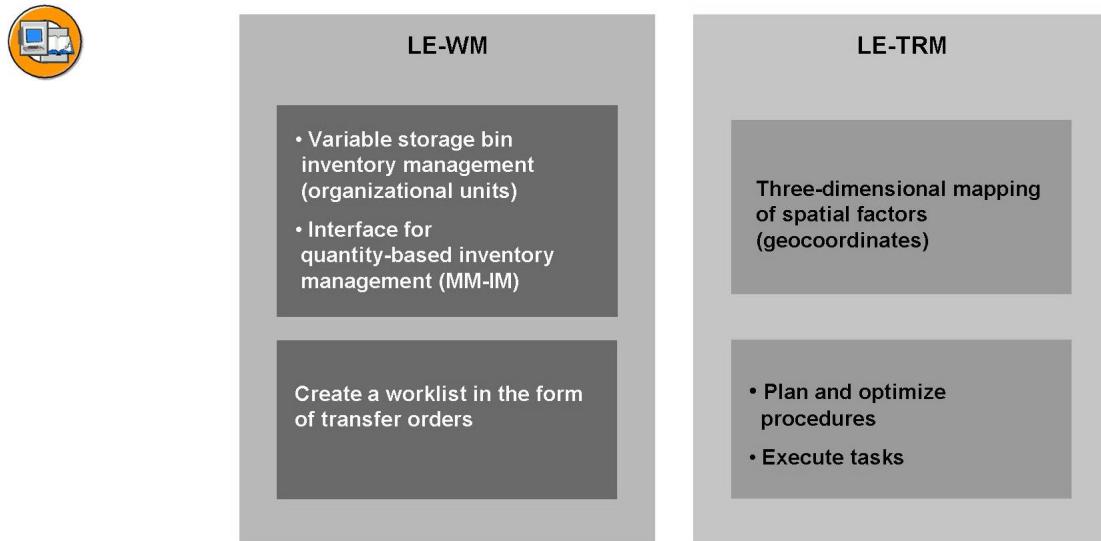


Figure 61: Comparison of Warehouse Management and TRM

If TRM is deployed, it fully or partially controls the **execution** of movements in the warehouse. Transfer orders, which represent warehouse management instructions in conventional systems, then act as a worklist for optimizing and subsequently executing putaway and stock removal processes when TRM is used. However, storage bin inventory management and the exchange of data between other SAP applications are still handled by Warehouse Management.

Preparatory Settings

The central organizational unit of TRM is a **site**. A site maps a warehouse complex in the system, whose processes are to be controlled using TRM. In Customizing for Warehouse Management, at least one warehouse number is assigned to the site first. The next step is to define which stock movements are relevant to TRM. Storage types and Warehouse Management movement types are used as criteria for determining the relevance of stock movements. When a transfer order is created, the system decides whether TRM will be involved in the process and, if required, generates a corresponding request.

The spatial factors of the warehouse complex are mapped in a three-dimensional **site map**. You therefore have to assign three coordinates to each of your storage bins. In addition, you have to define zones such as the pick-up and drop-off point, as well as the empty pallet zones, and make a note of obstacles that impede the passage of a resource between the start and destination zones. On the basis of this site map, the system calculates the route that resources take to move from one point to another when they are put away or removed from stock.

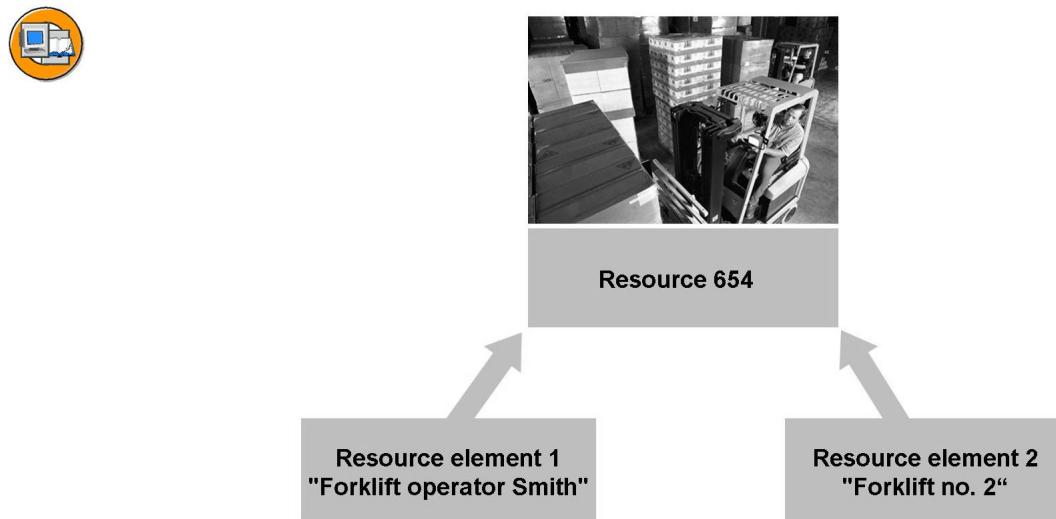


Figure 62: Resources in TRM

TRM creates a **resource** with a unique identification number when at least one resource element logs on to the system (or is logged on to the system). This resource is then displayed in the TRM Monitor, in which its movements can be controlled and monitored. Resource elements can be employees, vehicles, or devices. In Customizing for Resource Management, you define the resource type (for example, "forklift operator", "forklift", or "picker") to which future resource elements can belong. The system later uses the detailed settings for these categories to determine the capabilities of the resource. In this way, you can define the maximum speed of a vehicle, its area of application, and a type of load carrier that it can transport.

Process Flow in Task and Resource Management

TRM consists of several function packages that effectively optimize the putaway and removal of stock. **Request Management** accepts the transfer orders from Warehouse Management individually or in groups, and uses them to generate requests, which the "scheduler" releases to create tasks and forwards them to **Task Management**. Suitable routes are then calculated using **Route Management**. **Route Management** itself uses resource control services to find suitable resource types and calls up information about their capabilities. On the basis of this data, task management converts requests into tasks, in other words, the actual work instructions. These tasks form a list, from which the resource type suitable for executing the each task is determined. When tasks are executed, they can be monitored using **Execution Management**.

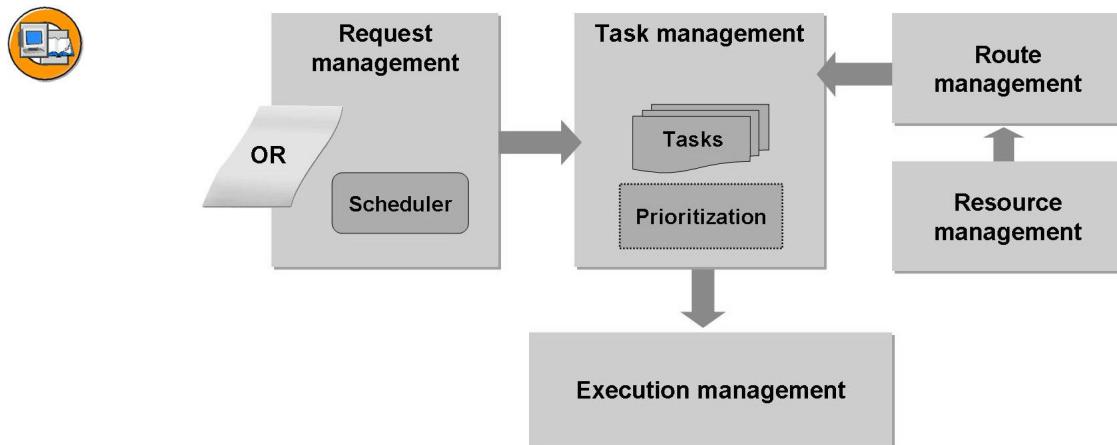


Figure 63: Warehouse Movements Process in TRM

Resources perform their assigned tasks, such as putting away stock into high rack storage, and confirm the execution in the system. (Mobile data entry is generally used here.) Depending on the presettings, the resource can choose specific tasks to process itself (user-guided mode) or accept tasks recommended by the system (system-guided mode). In user-guided mode, for example, the employee can scan the identification number of a storage unit and use TRM to search for the task that belongs to this storage unit. In system-guided mode, the system checks the properties and capabilities of a resource in order to find and assign suitable tasks. If a resource can perform more than one task at the same time, the system “prioritizes” these tasks and recommends that the task with the highest priority be executed first. Using the TRM monitor, you can control which criteria the system uses and with which weighting.

→ **Note:** In this way, for example, the estimated time that a resource needs to travel from its current site to the starting point of the new task can be taken into account.

In TRM, you can use task interleaving: a process by which a resource is assigned a new task when it completes another one. The follow-on task is executed in an area close to the resource's location at the time the first task finishes. Thus, an employee who has just completed a putaway could remove stock from a neighboring storage bin. In this way, deadheading can be reduced or even completely avoided.



Lesson Summary

You should now be able to:

- Explain the basic functions of TRM
- Describe the goods movement process in TRM



Unit Summary

You should now be able to:

- Describe the range of functions of the warehouse activity monitor
- Use the warehouse activity monitor to monitor warehouse processes
- Use the bin status report, indexes of empty storage bins, and capacity evaluations
- Name the uses of mobile data entry
- Describe the radio frequency (RF) solution in SAP ECC
- Use the RF monitor
- Explain the functions of cross-docking
- Describe possible scenarios in cross-docking
- Explain the basic functions of TRM
- Describe the goods movement process in TRM



Test Your Knowledge

1. Which of these objects are warehouse activity monitor objects?

Choose the correct answer(s).

- A Open deliveries
- B Open purchase orders
- C Negative stocks
- D Unconfirmed transfer orders
- E Blocked storage bins
- F Stocks in interim storage types

2. The warehouse activity monitor checks its objects across all warehouse numbers.

Determine whether this statement is true or false.

- True
- False

3. What is the function of the SAPConsole?

4. Which basic forms of cross-docking are available in Logistics Execution?

5. What is a route in TRM?



Answers

1. Which of these objects are warehouse activity monitor objects?

Answer: A, C, D, F

Open deliveries, negative stocks, unconfirmed transfer orders, and stocks in interim storage types are all warehouse activity monitor objects.

2. The warehouse activity monitor checks its objects across all warehouse numbers.

Answer: False

The warehouse activity monitor always checks the objects in **one** warehouse number.

3. What is the function of the SAPConsole?

Answer: The SAPConsole converts graphical displays into text displays (and vice versa).

4. Which basic forms of cross-docking are available in Logistics Execution?

Answer: In Logistics Execution, planned and “opportunistic” cross-docking are available. Planned cross-docking can be performed in one or two steps.

5. What is a route in TRM?

Answer: A route in TRM maps the path between a starting point and an end point that a resource follows to execute a task, in the system.



Course Summary

You should now be able to:

- Explain the organizational structures used in Logistics Execution
- Create and maintain all relevant master data
- Create the most important documents
- Map goods receipt and goods issue processes in the SAP system
- Monitor these processes in the warehouse activity monitor

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Feedback

SAP AG has made every effort in the preparation of this course to ensure the accuracy and completeness of the materials. If you have any corrections or suggestions for improvement, please record them in the appropriate place in the course evaluation.