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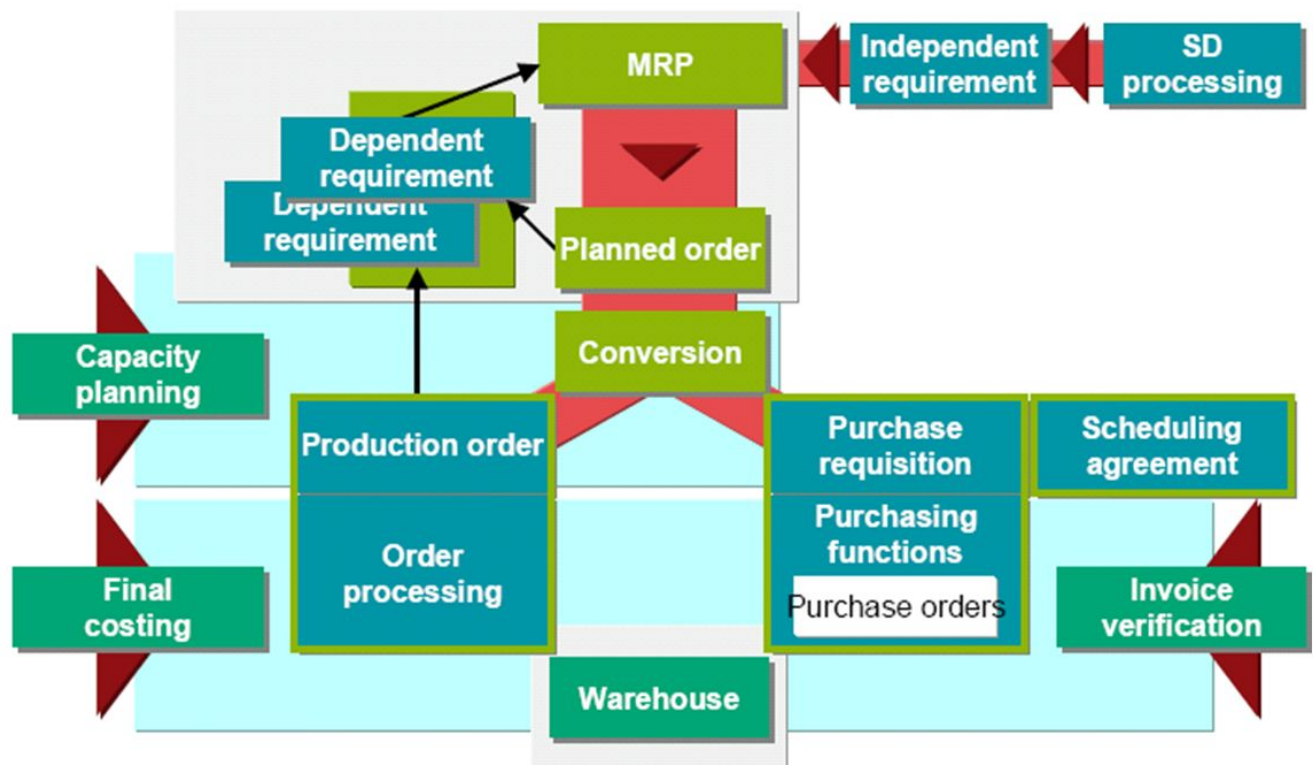
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Document Management

1. Introduction

1.1. MRP Overview

The main function of material requirements planning is to guarantee material availability, that is, it is used to procure or produce the requirement quantities on time both for internal purposes and for sales and distribution. This process involves the monitoring of stocks and, in particular, the automatic creation of procurement proposals for purchasing (i.e. **purchase requisitions**) and production.



2. Planning method

2.1. Consumption-based Planning

Consumption-based Planning is based on historical data and uses material forecasts or statistical procedures to determine future requirements. Consumption-based planning procedures do not refer to the production plan, i. e. requirements calculation is not triggered by independent or dependent requirements. It is either triggered by the available stock level falling below the reorder point or by forecast requirement calculated from historical data.

The planning procedures of consumption-based planning are easy-to-use methods of requirements planning which assist in achieving certain aims with relatively little effort.

One prerequisite of consumption-based planning is a smooth and up-to-date inventory management. The Consumption-based Planning is integrated in the Materials Management component of SAP.

3. MRP Master Data

SAP-MENU: *Logistics → Materials Management → Material Master → Material → Change → MM02 → Immediately*

3.1. Material Master: MRP1 – View

3.1.1. MRP Procedure

MRP procedure			
MRP type	1	VB	Manual reorder point planning
Reorder point	2	2,910	Planning time fence
Planning cycle			MRP controller
			3 001

1	MRP type	Determines whether or how the material is planned (manual reorder point planning, automatic reorder point planning...).
2	Reorder Point	In reorder point planning, procurement is triggered when the sum of plant stock and firmed receipts falls below the reorder point .
3	MRP controller	is a person or group responsible for planning material requirements

3.1.2. Reorder Point Planning

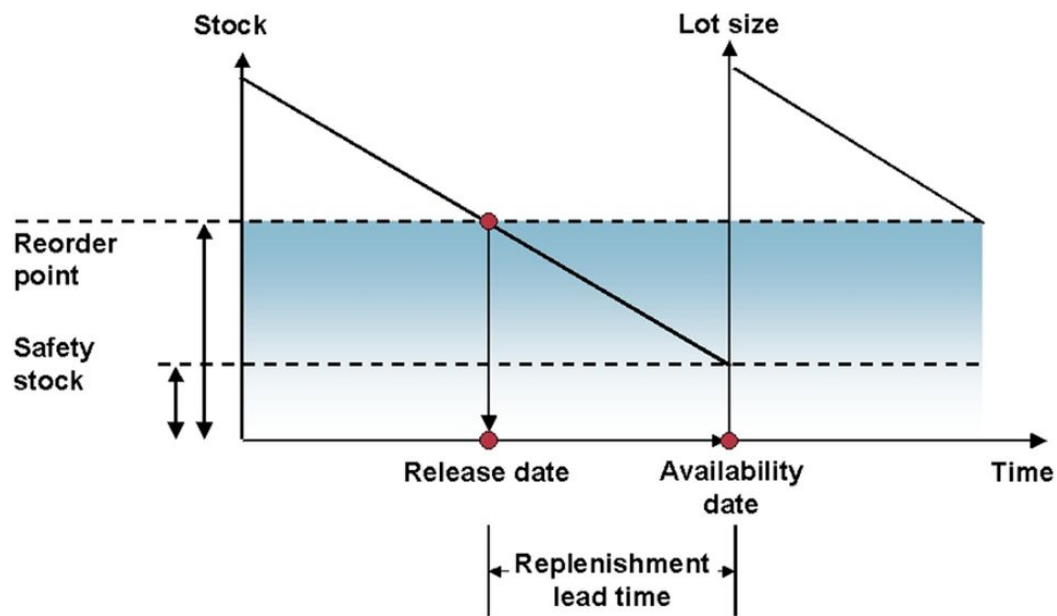
The **reorder point** should cover the average material requirements expected during the replenishment lead time.

The **safety stock** exists to cover both excess material consumption within the replenishment lead time and any additional requirements that may occur due to delivery delays. Therefore, the safety stock is included in the reorder level.

Two reorder point planning methods exist:

- **“VB” - Manual Reorder Point Planning:**
In manual reorder point planning, you define both the reorder level and the safety stock level manually in the appropriate material master.
 - **“V1” – Manual Reorder Point Planning with external requirements**
it is necessary to such external requirements are included in the net requirements calculation for reorder point materials.
- **“VM” - Automatic Reorder Point Planning:**
In automatic reorder point planning, both the reorder level and the safety stock level are determined by the integrated forecasting program. The system uses past consumption data (historical data) to forecast future requirements.
 - The system then uses these forecast values to calculate the reorder level and the safety stock level, taking the service level, which is specified by the MRP

controller, and the material's replenishment lead time into account, and transfers them to the material master.



3.1.3. Lot Size Data

Lot size data			
Lot size	4	EX	Lot-for-lot order quantity
Minimum lot size	5	2,920	Maximum lot size
Fixed lot size			Maximum stock level
Ordering costs			Storage costs ind.
Assembly scrap (%)			Takt time
Rounding profile			Rounding value
Unit of measure grp			

4	Lot size	Determines the lot-sizing procedure the system uses to calculate the quantity to be procured.
5	Minimum lot size	Minimum procurement quantity
6	Maximum lot size	Quantity that is not allowed to be exceeded during procurement
7	Maximum stock level	Quantity of the material in this plant that may not be exceeded.

In **static lot-sizing procedures**, the procurement quantity is calculated exclusively by means of the quantity specifications entered in the material master.

The following static lot-sizing procedures are available:

- **“EX” - Lot-for-lot order quantity**

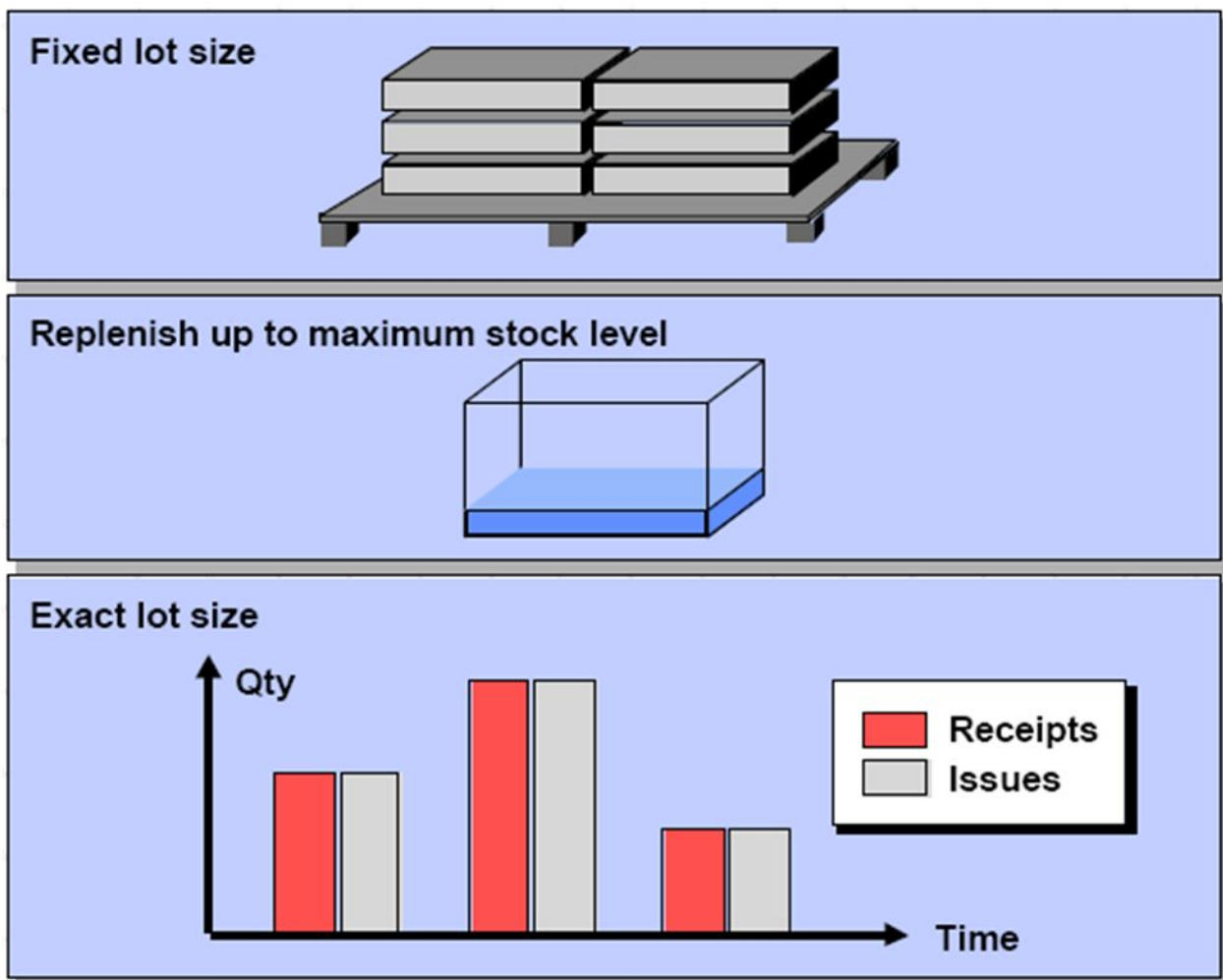
When planning using lot-for-lot order quantity, the system uses the exact shortage quantity (requirement minus available stock) as the order quantity in the case of a material shortage.

- **“FX” - Fixed lot size**

When planning using fixed lot size, the system will use the fixed order quantity recorded in the material master for the lot-size calculation if a material shortage exists. If the fixed lot size is not sufficient to balance out the material shortage, then several lots are planned for the same date until the material shortage is eliminated. It is useful to select a fixed lot size for a material, if it is only delivered, for example, in pallets of a certain quantity or in tanks of a certain size.

- **“HB” - Replenishment up to maximum stock level**

You use the lot-sizing procedure Replenishment up to maximum stock level if you want to fill the stock up to the highest possible level or if you can only store a certain quantity of a material due to the container size. This applies to a tank, for example. The capacity of the tank determines the maximum stock level.



3.1.4. Procurement / Scheduling

Procurement	
Procurement type	8 <input type="text" value="F"/>
Special procurement	<input type="text"/>
Quota arr. usage	<input type="text"/>
Backflush	<input type="text"/>
JIT delivery sched.	<input type="text"/>
<input type="checkbox"/> Bulk material	
Batch entry	<input type="text"/>
Issue stor. location	<input type="text"/>
Default supply area	<input type="text"/>
Storage loc. for EP	G106
Stock det. grp	<input type="text"/>

Scheduling	
GR processing time	<input type="text"/> days
SchedMargin key	<input type="text"/>
Plnd delivery time	9 <input type="text" value="60"/> days
Planning calendar	<input type="text"/>

8	Procurement type	Defines whether the material is produced in-house, is procured externally, or both.
9	Plnd delivery time	Number of calendar days needed to obtain the material or service if it is procured externally .

4. Planning Process

SAP-MENU: *Logistics → Materials Management → Material Requirements Planning (MRP) → MRP → Planning → Total Planning → MD01 Online*

4.1. Control Parameters for the Planning Run

MRP Run

Scope of planning	
Plant	S101

MRP control parameters

Processing key	NETCH	Net change for total horizon
Create purchase req.	1	Purchase requisitions
Schedule lines	1	No schedule lines
Create MRP list	1	MRP list
Planning mode	1	Adapt planning data (normal mode)
Scheduling	1	Basic dates will be determined for plann
Planning date	17.10.2008	

Process control parameters

<input type="checkbox"/> Parallel processing
<input type="checkbox"/> Display material list

User exit: select materials for planning

User exit key	201
User exit parameter	001

Various control parameters are available for the total planning procedure and for single-item planning, which you can set in the initial screen of the planning run. You use these parameters to determine how the planning run is to be executed and which results are to be produced.

The control parameters include:

- **Planning run type:** you can choose whether all materials are to be planned or only those with MRP relevant changes.
- **Creation indicator for procurement proposals for materials that are procured externally:** you can choose whether planned orders, purchase requisitions or schedule lines should be created for materials that are procured externally.

- **Creation indicator for MRP lists:** you can define whether MRP lists are to be created.
- **Planning mode:** you can determine how the system is to deal with procurement proposals (planned orders, purchase requisitions, scheduling agreement lines) from the last planning run, which are not yet firmed, in the next planning run.

4.2. Planning Result

During the planning process, the system automatically creates **procurement proposals**. They specify when the good receipt should be posted and the expected stock quantity. The order proposals can be:

- Planned Orders (for materials that are procured externally or are produced internally).
- Purchase Requisitions (for materials that are procured externally).
- Delivery Schedules Lines (for materials that are procured externally and are included in a source list and in a scheduling agreement).

The system creates **MRP lists** during the planning run according to how you set the creation indicator. These lists contain the planning result for the material. The MRP list always displays the stock/requirements situation at the time of the last planning run and it also provides a work basis for the MRP controller.

4.3. Evaluation of the Planning results

You can evaluate the planning situation or the result of a planning run using the stock / requirements list or MRP list. You can use individual or collective access.

4.3.1. MRP List

The system creates MRP lists during the planning run according to how you set the creation indicator. These lists contain the planning result for the material. The MRP list always displays the stock/requirements situation at the time of the last planning run and it also provides a work basis for the MRP controller. Changes that are made after the planning date are not taken into consideration, so the list is static.

MRP lists are stored in the system until they are either deleted manually or replaced by new lists from a subsequent planning run.

4.3.2. Stock/Requirements List:

SAP-MENU: Logistics → Materials Management → Material Requirements Planning (MRP) → MRP → Evaluations → MD04)

In the stock/requirements list, the most up-to-date stock and requirements situation is displayed.

The main difference between the MRP list and the stock/requirements list is that each time the stock/requirements list is called up, the system selects the various MRP elements and displays the most up-to-date situation. You thus always see the current availability situation of the material in the stock/requirements list. Changes that are made after the planning date are displayed directly, so the list is therefore dynamic.

Stock/requirements lists are not saved in a fixed state in the system, but are subject to change and only exist in the working memory.

5. Examples

5.1. Example 1

5.1.1. Min / Max Lot Size equal

MRP Settings		Test Data	
MRP type	VB	Stock level	2909
Reorder Point	2910	Ext. Requirements	-
Lot size	EX		
Min lot size	2920		
Max lot size	2920		
Max stock level	3000		

Planning Result: Individual Lines

☐ Firm date
 ☐ Procurement proposal
 ☐ Production order

Material: 12000310176 Filterschlauch DM 127x6000mm
 Plant: S101 MRP type: VB Material type: ZMCO Base unit: ST

	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					2,909	
	15.12.2008	PurRqs	0010858531/00010		01	2,920	5,829	G106

5.1.2. Min Lot Size = 1

MRP Settings		Test Data	
MRP type	VB	Stock level	2909
Reorder Point	2910	Ext. Requirements	-
Lot size	EX		
Min lot size	1		
Max lot size	2920		
Max stock level	-		

Planning Result: Individual Lines								
<input type="checkbox"/> Firm date <input type="checkbox"/> Procurement proposal <input type="checkbox"/> Production order								
Material 12000310176 Filterschlauch DM 127x6000mm Plant S101 MRP type VB Material type ZMC0 Base unit ST								
Σ	Date	MRP el	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					2,909	
	15.12.2008	PurRqs	0010858531/00010		01	2,920	5,829	G106

5.1.3. With external requirements

MRP Settings		Test Data	
MRP type	V1	Stock level	2909
Reorder Point	2910	Ext. Requirements	20
Lot size	EX		
Min lot size	1		
Max lot size	2920		
Max stock level	-		

PM – Order:

Display Reparaturauftrag 90925742: Component Overview													
Order: PM01 90925742 test für MRP Sys.status: FREI ABRV NMVP VOKL ANGL PLAB PLAN													
HeaderData Operations Components Costs Partner Objects Add. data Location Planning Control Enhancemnt													
Ite...	Component	Description	LT	Reqmnt qty	UM	IC	S...	SLoc	Plnt	OpAc	Batch	Recipient	Unlo...
0010	12000310176	Filterschlauch DM 127x6000mm		20	ST	L		S101	0010				

Planning Result: Individual Lines								
<input type="checkbox"/> Firm date <input type="checkbox"/> Procurement proposal <input type="checkbox"/> Production order								
Material 12000310176 Filterschlauch DM 127x6000mm Plant S101 MRP type V1 Material type ZMC0 Base unit ST								
Σ	Date	MRP el	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					2,909	
	13.10.2008	OrdRes	000090925742			20-	2,889	
	15.12.2008	PurRqs	0010858534/00010		01	21	2,910	G106

5.1.4. With external requirements / Max Lot Size

MRP Settings		Test Data	
MRP type	V1	Stock level	2909
Reorder Point	2910	Ext. Requirements	20
Lot size	EX		
Min lot size	1		
Max lot size	5		
Max stock level	-		

Planning Result: Individual Lines

Firm date

Procurement proposal

Production order

Material

12000310176

Filterschlauch DM 127x6000mm

Plant

S101

MRP type

V1

Material type

ZMCO

Base unit


ST


	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					2,909	
	13.10.2008	OrdRes	000090925742			20-	2,889	
	15.12.2008	PurRqs	0010858538/00010		01	5	2,894	G106
	15.12.2008	PurRqs	0010858539/00010		01	5	2,899	G106
	15.12.2008	PurRqs	0010858540/00010		01	5	2,904	G106
	15.12.2008	PurRqs	0010858541/00010		01	5	2,909	G106
	15.12.2008	PurRqs	0010858542/00010		01	1	2,910	G106


5.1.5. Lot size = HB / Max Stock Level


MRP Settings		Test Data	
MRP type	V1	Stock level	2909
Reorder Point	2910	Ext. Requirements	20
Lot size	HB		
Min lot size	1		
Max lot size	50		
Max stock level	3000		

Planning Result: Individual Lines

 Firm date

 Procurement proposal

 Production order

 Material

12000310176

Filterschlauch DM 127x6000mm

Plant

S101

MRP type


V1






Material type

ZMCO

Base unit

ST



	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					2,909	
	13.10.2008	OrdRes	000090925742			20-	2,889	
	15.12.2008	PurRqs	0010858543/00010		01	50	2,939	G106
	15.12.2008	PurRqs	0010858544/00010		01	41	2,980	G106

5.1.6. With external requirements / Max Stock Level

MRP Settings		Test Data	
MRP type	V1	Stock level	2909
Reorder Point	2910	Ext. Requirements	150
Lot size	HB		
Min lot size	90		
Max lot size	2910		
Max stock level	3000		

Planning Result: Individual Lines

☐ Firm date
 ☐ Procurement proposal
 ☐ Production order

Material: 12000310176 Filterschlauch DM 127x6000mm
 Plant: S101 MRP type: V1 Material type: ZMCO Base unit: ST

	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					2,909	
	13.10.2008	OrdRes	000090925742			150-	2,759	
	15.12.2008	PurRqs	0010858552/00010		01	151	2,910	G106

5.1.7. With external requirements + Min Lot Size > HB

MRP Settings		Test Data	
MRP type	V1	Stock level	2909
Reorder Point	2910	Ext. Requirements	150
Lot size	HB		
Min lot size	150		
Max lot size	2910		
Max stock level	3000		

Planning Result: Individual Lines

☐ Firm date
 ☐ Procurement proposal
 ☐ Production order

Material: 12000310176 Filterschlauch DM 127x6000mm
 Plant: S101 MRP type: V1 Material type: ZMCO Base unit: ST

	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					2,909	
	15.12.2008	PurRqs	0010858555/00010		01	150	3,059	G106

5.1.8. With external requirements + Min Lot Size > HB


MRP Settings		Test Data	
MRP type	V1	Stock level	2909
Reorder Point	2910	Ext. Requirements	6000
Lot size	HB		
Min lot size	150		
Max lot size	7000		
Max stock level	3000		

Planning Result: Individual Lines

<input type="checkbox"/> Firm date <input type="checkbox"/> Procurement proposal <input type="checkbox"/> Production order							
	12000310176		Filterschlauch DM 127x6000mm				
Plant	S101	MRP type	V1	Material type	ZMC0	Base unit	ST 
	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity Sto...
	13.10.2008	Stock					2,909
	13.10.2008	OrdRes	000090925742			6,000-	3,091-
	15.12.2008	PurRqs	0010858561/00010		01	6,001	2,910 G106

5.1.9. Proposed settings for this example

Change Material 12000310176 (MRP 1, Consumable materials)

Material: 12000310176 Filterschlauch DM 127x6000mm 
 Plant: S101 Siggenthal

General data

Base unit of measure	ST	Stück	MRP group	
Purchasing group	S25		ABC indicator	A
Plant-sp.matl status			Valid from	


MRP procedure




MRP type	V1	Manual reord.point w. ext.reqs
Reorder point	2,910	Planning time fence
Planning cycle		MRP controller
		001

Lot size data


Lot size	HB	Replenish to maximum stock level
Minimum lot size	100	Maximum lot size
		2,910
Fixed lot size		Maximum stock level
		3,000
Ordering costs		Storage costs ind.
Assembly scrap (%)		Takt time
Rounding profile		Rounding value
Unit of measure grp		

Planning Result: Individual Lines

Material: 12000310176 Filterschlauch DM 127x6000mm
 Plant: S101 MRP type: V1 Material type: ZMCO Base unit: ST 

	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					2,909	
	13.10.2008	OrdRes	000090925742			10-	2,899	
	15.12.2008	PurRqs	0010858565/00010		01	100	2,999	G106

5.2. Example 2






Material	12000078733	Polyamid-Becher, Typ WB 370	
Plant	S101	Siggenthal	

5.2.1. MRP type “VB”

MRP Settings		Test Data	
MRP type	VB	Stock level	50
Reorder Point	50	Ext. Requirements	10
Lot size	EX		
Min lot size	100		
Max lot size	200		

With the **MRP Type = VB** the external requirements are not included in the net requirements calculation. As a result of this, **no** purchase requisition are created:

Planning Result: Individual Lines

<input type="checkbox"/> Firm date <input type="checkbox"/> Procurement proposal <input type="checkbox"/> Production order							
	Material	12000078733	Polyamid-Becher, Typ WB 370				
	Plant	S101	MRP type	VB	Material type	ZMCO	Base unit ST 
	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity
	13.10.2008	Stock					50
	13.10.2008	OrdRes	000090925742			10-	40

5.2.2. MRP type “V1”

MRP Settings		Test Data	
MRP type	V1	Stock level	50
Reorder Point	50	Ext. Requirements	10
Lot size	EX		
Min lot size	100		
Max lot size	200		

With the **MRP Type = V1** the external requirements are included in the net requirements calculation. As a result of this, purchase requisition is created:

Planning Result: Individual Lines

Material: 12000078733 Polyamid-Becher, Typ WB 370
Plant: S101 MRP type: V1 Material type: ZMCO Base unit: ST

	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					50	
	13.10.2008	OrdRes	000090925742			10-	40	
	17.11.2008	PurRqs	0010858566/00010		01	100	140	G101

5.2.3. With external requirements / Max lot size

MRP Settings		Test Data	
MRP type	V1	Stock level	50
Reorder Point	50	Ext. Requirements	900
Lot size	EX		
Min lot size	50		
Max lot size	620		
Max stock level			

Planning Result: Individual Lines

Material: 12000078733 Polyamid-Becher, Typ WB 370
Plant: S101 MRP type: V1 Material type: ZMCO Base unit: ST

	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					50	
	13.10.2008	OrdRes	000090925742			620-	570-	
	13.10.2008	OrdRes	000090925743			280-	850-	
	17.11.2008	PurRqs	0010858568/00010		01	620	230-	G101
	17.11.2008	PurRqs	0010858569/00010		01	280	50	G101

5.2.4. Lot size = “FX”

MRP Settings		Test Data	
MRP type	V1	Stock level	50
Reorder Point	50	Ext. Requirements	280
Lot size	FX	Fixed Lot Size	100
Min lot size	-		
Max lot size	-		
Max stock level			

Planning Result: Individual Lines

Firm date

Procurement proposal

Production order

Material

12000078733

Polyamid-Becher, Typ WB 370

Plant

S101

MRP type

V1

Material type

ZMCO

Base unit

ST

	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					50	
	13.10.2008	OrdRes	000090925743			280-	230-	
	17.11.2008	PurRqs	0010858575/00010		01	100	130-	G101
	17.11.2008	PurRqs	0010858576/00010		01	100	30-	G101
	17.11.2008	PurRqs	0010858577/00010		01	100	70	G101

5.2.5. Lot Size “HB”

MRP Settings		Test Data	
MRP type	V1	Stock level	50
Reorder Point	50	Ext. Requirements	280
Lot size	HB		
Min lot size	50		
Max lot size	1370		
Max stock level	620		

Planning Result: Individual Lines

Firm date

Procurement proposal

Production order

Material

12000078733

Polyamid-Becher, Typ WB 370

Plant

S101

MRP type

V1

Material type

ZMCO

Base unit

ST

	Date	MRP el...	MRP element data	Reschedulin...	E...	Rec./reqd qty	Avail. quantity	Sto...
	13.10.2008	Stock					50	
	13.10.2008	OrdRes	000090925743			280-	230-	
	17.11.2008	PurRqs	0010858581/00010		01	570	340	G101

6. Document Management

Date	Version	Comments	Author
13.10.2008	1.0	Draft	B. Thalmann
29.12.2008	1.1	1st Revision after review of H. Häutle	B. Thalmann