Consumption-Based Planning (MM-CBP)

HELP.MMCBPCBP

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Icons

Icon	Meaning
⚠	Caution
	Example
💡	Note
🧭	Recommendation
SYN	Syntax

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Consumption-Based Planning

Purpose

The central role of MRP is to monitor stocks and in particular, to automatically create procurement proposals for purchasing and production (planned orders, purchase requisitions or delivery schedules). This target is achieved by using various materials planning methods which each cover different procedures.

Consumption-based planning is based on **past consumption values** and uses the forecast or other statistical procedures to determine future requirements. The procedures in consumption-based planning do not refer to the master production schedule. That is, the net requirements calculation is not triggered either by planned independent requirements or dependent requirement. Instead, it is triggered when stock levels fall below a **predefined reorder point** or by **forecast requirements** calculated using past consumption values.

Implementation Considerations

Consumption-based planning procedures are simple materials planning procedures, which you can use to achieve, set targets with relatively little effort. Therefore, these planning procedures are used in areas without in-house production and/or in production plants for **planning both B- and C-parts** and **operating supplies**.

The prerequisites for implementing consumption-based planning are:

- If you use forecast requirements, the consumption pattern should be fairly constant or linear with few irregularities.

- Your Inventory Management must function well and should always be up-to-date.

Integration

Consumption-based planning is integrated in the *Materials Management* component. You can access the consumption-based planning functions from the SAP Easy Access Menu by choosing *Logistics → Materials Management → Materials Planning → MRP.*

See also:

Features

MRP Procedures

In consumption-based planning, the following MRP procedures are available:

- Reorder point procedure

- Forecast-based planning

- Time-phased materials planning

Creation of procurement proposals

The type of procurement proposal to be created automatically in the planning run depends on the procurement type of the material. For in-house production, the system always creates a planned order. For external procurement, the MRP controller can choose between a planned order and a purchase requisition. If the MRP controller chooses a planned order, it then has to be converted into a purchase requisition in a separate step so that it is made available to Purchasing.

The advantage of creating a planned order is that the MRP controller has more control over the procurement proposals. The purchasing department cannot order the material until the MRP controller has checked and converted the order proposal. If a purchase requisition is created, it is immediately available to the purchasing department, which then takes over the responsibility for material availability and warehouse stocks.

Planning at plant level or for MRP areas

As materials planning is usually carried out at plant level, all available stock in the plant (from now on described as available warehouse stock) is taken into account during planning. However, stocks from individual storage locations can be excluded from requirements planning or they can be planned independently. These stocks are then not included in material requirements planning at plant level. On the other hand, consignment stocks from the vendor are always included in MRP.

You can also carry out MRP for individual MRP areas. You can define the MRP areas. This means, for example, that you can group several storage locations into one MRP area and carry out MRP for this MRP area.

Lot-sizing procedures

The standard lot-sizing procedures are available in the R/3 System. However, you can quite easily integrate your own formulas without much effort.

Automatic planning run

The automatic planning run determines shortages and creates the appropriate procurement elements. The system creates notes for critical parts and exceptional situations providing you with the necessary information for processing the planning results.

Overview of the Main Transaction Codes for CBP

Transaction	Activity
MD01	Carry out total planning online
MD03	Carry out single-item, single-level planning
MDBT	Carry out total planning in background mode
MD05	Display MRP list
MD06	Access collective display of MRP list
MDLD	Print MRP list
MD04	Display current stock/requirements list
MD07	Display collective display of current stock/requirements list
MD11	Create planned order
MD12	Change planned order
MD13	Display planned order (individual)
MD16	Access planned order (collective display)
MD14	Convert planned order to purchase requisition (individual conversion)
MD15	Convert planned order to purchase requisition (collective conversion)
MD20	Create planning file entry
MD21	Display planning file entry
MDAB	Set up planning file entries
MDRE	Consistency check of planning file entries

MRP Procedures in Consumption-Based Planning

Use

In consumption-based planning, the following MRP procedures are available:

- Reorder point procedure

- Forecast-based planning

- Time-phased materials planning

Reorder Point Planning

Use

In reorder point planning, procurement is triggered when the sum of plant stock and firmed receipts falls below the **reorder point**.

Features

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.

The following values are important for defining the reorder point:

- Safety stock
- Average consumption
- Replenishment lead time

The following values are important for defining the safety stock:

- Past consumption values (historical data) or future requirements
- Vendor/production delivery timelines
- Service level to be achieved
- Forecast error, that is, the deviation from the expected requirements

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.

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.

Since the forecast is carried out at regular intervals, the reorder level and the safety stock level are continually adapted to the current consumption and delivery situation. This means that a contribution is made towards keeping stock levels low.

Reorder Point Planning Procedure

Prerequisites

- You have set an *MRP type* for reorder point planning in the material master (*MRP 1* view).

    You define MRP types in Customizing for MRP in the IMG activity *Check MRP types*.

- In the material master, you have entered or let the system automatically calculate and enter the values for the reorder point (*MRP 1* view) and for the safety stock (*MRP 2* view).

Process Flow

1. The **continuous monitoring** of available warehouse stock within reorder point planning is carried out in Inventory Management.

    Every time a **material is withdrawn** from the warehouse, the system checks whether this withdrawal has caused stock levels to fall below the reorder level. If this is the case, the system makes an entry in the planning file for the next planning run (see also Checking the Planning File [Page 49]).

    If a **material is returned** to the warehouse, the system checks in exactly the same way whether the available warehouse stock exceeds the reorder level again. If this is the case, an entry is made in the planning file, which acts as an indicator for the planning run to delete any unnecessary procurement proposals.

    If planned receipts are no longer required due to **material returns**, for example, then the system will suggest that these receipts should be cancelled. In this case, the MRP controller in cooperation with Purchasing or Production must check whether the purchase order or the production order can be cancelled.

2. The system then **calculates the net requirements**. The system compares the available stock at plant level (including safety stock) plus the firmed receipts that have already been planned (purchase orders, production orders, firmed purchase requisitions and so on) with the reorder point. If the sum of the stock plus receipts is less than the reorder point, a material shortage exists.

Reorder Point Planning Procedure
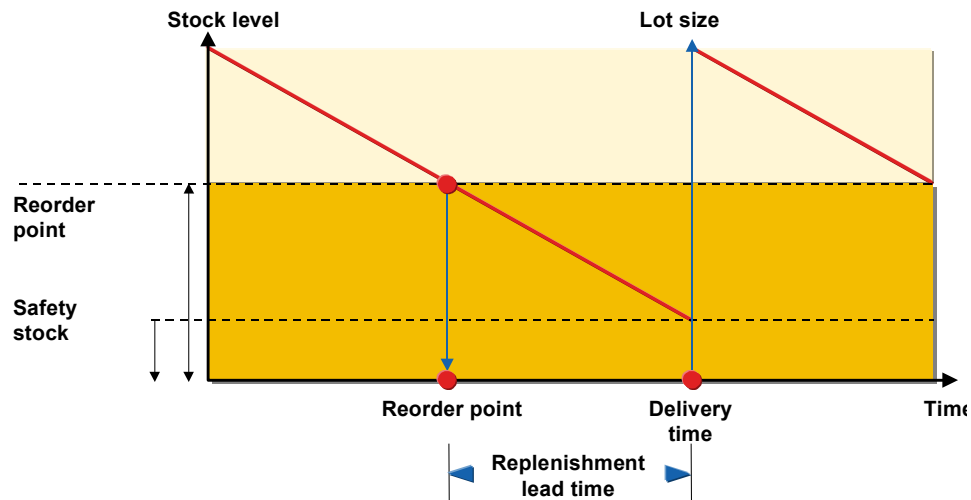
3. The system then calculates the **procurement quantity** according to the **lot-sizing procedure** defined in the material master.

> For reorder point planning, the system supports the *Fixed lot size* and *Replenish up to maximum stock level* lot-sizing procedures.

> You can also use period or optimum lot-sizing procedures for reorder point materials. In this case, you must calculate future requirements using the forecasting functions. The forecast values are then interpreted as requirements.

4. The system then **schedules** the procurement proposal, that is, the system calculates the dates on which the purchase order has to be sent, or when production has to begin and the date on which the vendor has to deliver the goods or by which production has to have the goods ready.

Reorder Point Planning with External Requirements

Use

In reorder point planning, an entry is only created in the planning file and the net requirements calculation is only carried out if stock levels fall below the reorder point. To avoid overplanning, sales orders, dependent requirements, reservations and so on are not usually included in the net requirements calculation as these future requirements are already planned with the reorder level. However, to guarantee that the MRP controller is informed of current issues, the system displays sales orders, dependent and manual reservations and so on.

In certain circumstances, however, it is necessary to include such external requirements in the net requirements calculation for reorder point materials.

Integration

The indicator for taking external requirements into account is set in Customizing in the IMG activity *Check MRP type* for the individual time-phased MRP procedure.

Features

Sales orders and manual reservations are included in planning during the **replenishment lead time**. In Customizing you can also enter settings for the respective MRP type, so that

- sales orders and manual reservations are included in planning not just during the replenishment lead time but during the whole horizon.

- alongside sales orders and manual reservations various other requirements are taken into account in the material requirements planning.

Forecast-Based Planning

Use

Forecast-based planning is also based on **material consumption**. Like reorder point planning, forecast-based planning operates using historical values and forecast values and future requirements are determined via the integrated forecasting program. However, in contrast to reorder point planning, these values then form the basis of the planning run. The **forecast values** therefore have a direct effect in MRP as **forecast requirements**.

Features

The forecast, which calculates future requirements using historical data, is carried out at regular intervals. This offers the advantage that requirements, which are automatically determined, are continually adapted to suit current consumption needs. The forecast requirement is reduced by the material withdrawal so that the forecast requirement quantity that has already been produced is not included in the planning run again.

Reducing Forecast Requirements

- **Reducing forecast requirements** by consumption

  If consumption is higher than the forecast requirements in the current month, then the system also reduces future forecast requirements.

- **Reducing current forecast requirements** by consumption

  If consumption is higher than the forecast requirements in the current month, then the system does **not** reduce future forecast requirements.

- **Average reduction** of the forecast requirements

  The reduction of the forecast requirements is based on average daily consumption. Actual consumption data is not relevant.

  The system calculates the average daily requirement first using the formula *forecast requirement/number of workdays in the forecast period.*

  The forecast requirements are then reduced by the quantity resulting from the following formula: *number of workdays worked x average daily requirements.*

Period Pattern and Forecast Periods

You can specify the **period pattern for the forecast** (daily, weekly, monthly or per accounting period) and the **number of periods to be included in the forecast** individually for each material. It is possible, however, that the forecast period pattern is not specific enough for planning purposes. In this case, you can define per material that the forecast requirements should be divided according to a finer period pattern for planning. You can also define how many forecast periods are to be taken into account during requirements planning. The splitting indicator is defined in Customizing for MRP per plant and per period unit and is assigned to the material in the material master.

> For a monthly forecast, the requirements date would be set on the first workday of the month because, for planning, it is assumed that the total requirement must be

available at the beginning of the period. You can then divide this monthly requirement into either daily or weekly requirements.

Forecast-Based Planning Procedure

Prerequisites

You have set an *MRP type* for forecast-based planning in the material master (*MRP 1* view).

> You define MRP types in Customizing for MRP in the IMG activity *Check MRP types*.

Process Flow

1. The system copies the requirements quantities that it has forecast in the requirements planning run and **calculates net requirements**. During this calculation, every period is checked to make sure that the forecast requirements are covered either by available stock, by planned receipts from purchasing or by production. If a material shortage occurs, the system generates a procurement proposal.

2. The system calculates the **quantity** recorded in the procurement proposal according to the **lot-sizing procedure** that you specified in the material master. Depending on the lot-sizing procedure, several forecast requirements are grouped together into one lot.

3. For every procurement proposal, the system calculates the date on which it must be converted into a purchase order or a production order.

Time-Phased Planning

Use

If a vendor always delivers a material on a particular day of the week, it makes sense to plan this material according to the same cycle, in which it is delivered.

Features

Materials that are planned using the time-phased planning technique are provided with an **MRP date** in the planning file. This date is set when creating a material master and is re-set after each planning run. It represents the date on which the material is to be planned again and is calculated on the basis of the planning cycle entered in the material master.

The net change planning indicator and the net change planning horizon indicator are irrelevant for materials planned using the time-phased planning procedure. The system does not therefore set these if changes are made in the planning run.

If you want to plan a material earlier than the specified MRP date, you can enter an MRP date during the planning run. For example, if the planning run is set for Monday, you can bring it forward to Saturday instead.

> If you use the SAP Retail System, the system proposes the planning cycle from the vendor sub-range when you create a material master record. The vendor sub-range contains all the goods of a particular vendor that, from a logistical view, can be planned similarly.

Time-phased planning can be executed using consumption-based planning or MRP:

- If you want to carry out time-phased planning using **consumption-based planning** techniques, the requirements have to be created using the material forecast. If you use consumption-based planning, only the forecast requirements are included in the net requirements calculation. For reducing the forecast requirements, you can choose the same settings in Customizing as used for forecast-based planning.

- If you want to carry out time-phased planning using MRP, all the requirements that are relevant to MRP are included in the net requirements calculation. For this purpose, the indicator *Time-phased with requirements* must have been selected in the MRP type. The forecast requirements can also be taken into account in this process.

Time-Phased Planning Procedure

Prerequisites

In the material master:

- You have entered an *MRP type* for time-phased planning and the *planning cycle* in the form of a planning calendar (*MRP 1* view).

- You have defined a *planned delivery time* (*MRP 2* view).

- You have entered *lot-for-lot order quantity* as the MRP lot size (*MRP 1* view).

> You can also use the optimum lot-sizing procedures for time-phased planning. They are used here in the same way as in reorder point planning.

> You define MRP types in Customizing for MRP in the IMG activity *Check MRP types*.

Process Flow

1. When you start the planning run, the system uses the MRP date recorded in the planning file to check which materials are actually to be planned. The planning date is calculated using the planning cycle.

2. The system calculates **requirements**. It also then determines a time interval. This **time interval** must take into account that the material has to cover all requirements up to the next MRP date including the delivery time.

    The requirements are calculated according to the following formula:

    Forecast requirements - or other requirements in the interval (interval = planning cycle + purchasing processing time + planned delivery time + goods receipt processing time) + safety stock
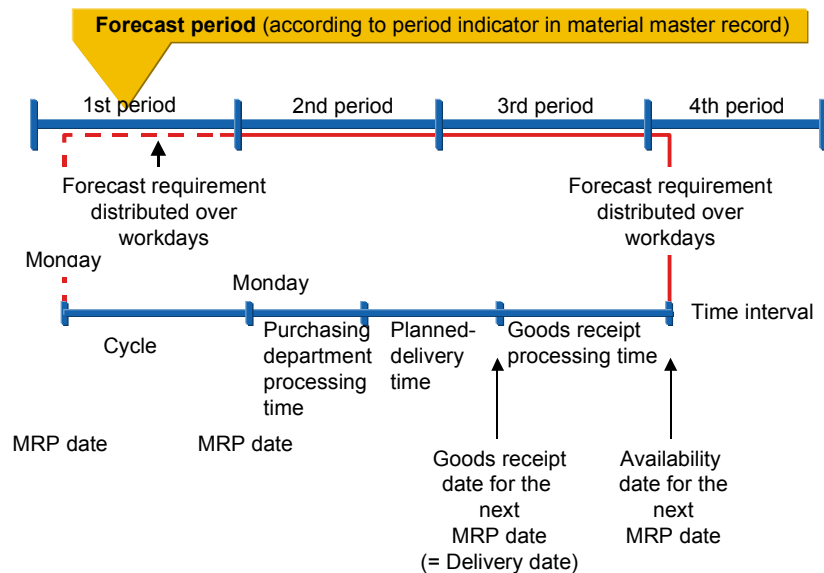
The requirements of the periods that completely lie within the interval in question are taken into account when calculating the requirements. If a requirement does not completely lie within the interval, the system only takes part of it into account.

The planned delivery time is calculated according to calendar days and the purchasing processing time and the goods receipt processing time are calculated in workdays.

3. In the net requirements calculation, the system reduces the requirements calculated in the interval by stock and firmed receipts. The remaining quantity is equal to the **shortage quantity**.

4. If you use the lot-for-lot, the system creates a **procurement proposal** for the amount of the shortage quantity. If you have selected another lot-sizing procedure, the quantity in the order proposal depends on the lot-sizing procedure.

During the calculation, the system takes for granted that the firmed receipts lie in the interval in question. It does not matter whether the firmed receipts are available at the beginning or not until the end of the interval. This means that a temporary shortage may exist, however, this is accepted.

Range of Coverage Profile in Time-Phased Planning

Use

Using the **range of coverage profile**, you can determine a safety stock level based on current requirements. This safety stock level is calculated using the average daily requirements quantity.

Prerequisites

You have a *range of coverage profile* in the material master (*MRP 2* view).

> You define range of coverage profiles in Customizing for MRP in the IMG activity *Define range of coverage profile (dynamic safety stock)*.

Features

Example

For example, a material that has a planned delivery time of 2 days is always planned on Tuesdays. In the net requirements calculation during the planning run, the system uses the interval between the MRP date and the availability date of the next MRP date. In this particular case, the interval starts on Tuesday and ends on Thursday of the following week (8 workdays).

- Requirements calculation **without entering a range of coverage profile**

    The system calculates a requirement of 160 pieces using the information from the forecast that was carried out previously. If the system does not take a range of coverage into account, it simply creates a **procurement proposal for 160 pieces**, if the stock level is equal to zero and no firmed receipts exist.

- Requirements calculation when the following range of coverage is entered

Minimum range of coverage	3 days
Dynamic minimum safety stock	60 pieces
Target range of coverage	5 days
Dynamic target safety stock	100 pieces
Maximum range of coverage	12 days
Dynamic maximum safety stock	240 pieces

- If warehouse stock is equal to zero, the system adds a further 100 pieces to the procurement proposal for 160 pieces mentioned above as the incoming quantity has to cover an extra 5 days. This means that the system creates a procurement proposal for 260 pieces.

- If warehouse stock is equal to 200 pieces, the system creates a procurement proposal for 60 pieces as the remaining 40 pieces would only cover a further 2 days and the stock should cover at least another 3 days. If the minimum safety stock level is not fulfilled, the system replenishes up to the target safety stock level.

- If warehouse stock is equal to 220 pieces, the system creates no procurement proposal, as the remaining 60 pieces will still cover the next 3 days requirements.

−   If warehouse stock is equal to 410 pieces, the system creates an exception message in the planning run to the effect that excess stock exists - the stock will last longer than 12 days (160 + 12x20 = 400). Moreover, the system also indicates that the stock level of 150 pieces is too high. The target stock level is 260 pieces (requirements + target safety stock).

See also:

Calculating the Statistical Range of Coverage [Ext.]

Time-phased Planning Process with Delivery Cycle

Use

If you have to deal with more complex situations, you can define a **delivery cycle** in addition to the **planning cycle**. In so doing, you define the days on which the vendor delivers the goods.

You enter a delivery cycle if the delivery date (or the goods receipt date) depends on the day on which you order the goods. For example, you execute the planning run and place your orders on Mondays and Tuesdays. If you place the order on Monday, the delivery is made on Wednesday. If you place the order on Tuesday, the delivery is not made until Friday.

> If you use the SAP Retail System, the system proposes the delivery cycle from the vendor sub-range when you create a material master. The vendor sub-range contains all the goods of a particular vendor that, from a logistical view, can be planned similarly.

Prerequisites

In the material master (*Planning calendar* field in the *MRP 2* view), you have defined a *delivery cycle* in the form of a planning calendar in addition to the planning cycle.

Features
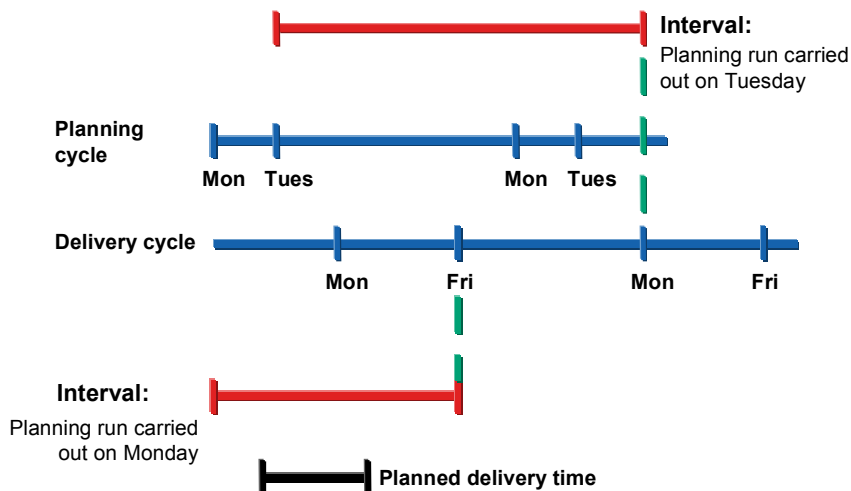
If you start the planning run, the system uses the MRP date recorded in the **planning file** to check which materials are actually to be planned. The system **calculates requirements** independently from that, whether you have entered a delivery cycle or not. The system uses the **time interval** between the MRP date and the availability date for the next MRP date as a basis for calculating the requirements quantity. It also takes for granted that the vendor requires at least the planned delivery time before he can deliver his goods. This means the following (if no goods receipt processing time has been maintained):

- If the MRP date is a Monday, the interval used for the calculation is from Monday to Friday, as the Friday is the goods receipt date of the **next** MRP date (Tuesday).

- If the MRP date is a Tuesday, the interval used for the calculation is from Tuesday to the Wednesday of the following week, as the Wednesday is the goods receipt date of the **next** MRP date (Monday).

The material's stocks (stock plus firmed receipts in the interval) must cover this interval. If a material shortage occurs, the system creates a new procurement proposal.

The system interprets the planned delivery time as the 'minimum delivery time'. That is, it takes at least this number of days for the goods to be delivered from the time that the order was placed. Thus, the system recognizes in the example above that if the planning run is carried out on Tuesday, the material will not be delivered until Friday and not on Wednesday.

The processing time required for the Purchasing department is taken into account. The planned delivery time plus the purchasing processing time must be smaller than the period between the date of the next planning run and the corresponding goods receipt date.

Time-phased Planning Process with Reorder Point Planning

Use

You can combine time-phased planning with reorder point planning.

Prerequisites

- You have set the *MRP type* for time-phased planning in the material master (*MRP 1* view).

- You have defined a reorder point or a forecast has calculated it automatically and you have entered it in the material master (*MRP 1* view).

Features

The material is not only planned up to the **MRP date** recorded in the planning file, but it is also planned if **stock falls below the reorder level due to a goods issue**. When the stock level falls below the reorder level, the system automatically sets the net change planning indicator in the planning file, which means that the material will be included in the next planning run.

It calculates the interval that starts from the moment that stocks fall below the reorder level to the availability date of the next regular MRP date and uses this for the requirements calculation. The ordered quantity must cover this interval. On the following MRP date, the material is planned as usual.

R = MRP dates   **X** = extraordinary MRP date,
  according to cycle   as stock fallen below reorder level
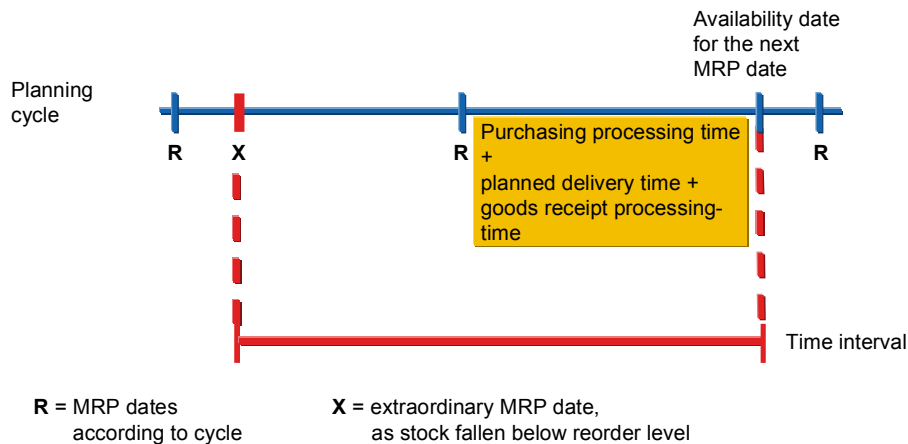
Master Data

Features

The master data in the area of consumption-based planning includes:

- PPC Planning calendar

- Quota arrangements

Planning Calendar

Definition

Planning calendars define flexible period lengths for material requirements planning at plant level.

Use

- Using the planning calendar, you can define flexible periods for a period lot-sizing procedure in master production scheduling and in MRP. The system groups together the purchase order proposals, which fall within the period defined in the planning calendar, to form a lot. You allocate this special lot-sizing procedure to the material in the material master together with the planning calendar (see Period Lot-Sizing Procedures [Page 71]).

- You can also use the periods in the planning calendar for the **period totals display in the stock/requirements list**. If a planning calendar is valid for a particular material or if a planning calendar is entered at plant level in Customizing, the receipts and issues in the period totals display can also be grouped together according to the periods of the planning calendar(see Display of Period Totals [Page 183]).

- Finally, you can also use it to define **flexible splitting periods for demand management**. The total planned independent requirements quantity for a certain period (for example, for one year) is then divided up according to the period defaults in the planning calendar.

Creating Planning Calendars with Calculation Rule

1. Starting from the *MRP* menu choose *Master data* → *Planning calendar* → *Create periods*.

    The initial screen for planning calendar maintenance now appears.

2. Enter the plant for which the planning calendar is to be valid.

3. Enter a combination of numbers or letters of up to three digits in length for identifying the calendar and choose ✔. This entry is alphanumeric.

    The screen used for maintaining the planning calendar now appears.

4. Enter a short description of the planning calendar.

5. Enter the *minimum period*.

    The minimum period is used as a time limit for maintenance of a calendar that is no longer valid. You use the minimum period to define the period necessary for reprocessing the calendar. If the time limit is exceeded, the system displays the calendar for processing (see Changing the Planning Calendar [Page 34]), even when the *Valid to* date has not been reached yet. You should therefore define the minimum period so that, in the future, the system displays the planning calendar for processing on time in the future.

    You define the validity period of the calendar after you have defined the planning rule.

6. Specify how the system should proceed if the period start happens to fall on a day that is not defined as a workday in the factory calendar.

7. Choose ✔.

    The system displays the *Select calculation rule* dialog box. The calculation rule determines the calculation of the periods for the planning calendar.

8. Choose the calculation rule you require:

    − *weeks (weekdays)*

        Example: period start on Monday and Wednesday every week

    − *months (weekdays)*

        Example: period start on every second Wednesday of the month

    − *months (workdays)*

        Example: period start on every fifth workday of the month

        You can specify the workday/workdays of the planning calendar according to the workdays defined in the factory calendar.

    − *years (workdays)*

        Example: period start on every fifth workday of the year

        You can specify the workday/workdays of the planning calendar according to the workdays defined in the factory calendar.

    − *workdays*

        Example: period start on every fifth workday from a particular start date

Creating Planning Calendars with Calculation Rule

> You can specify the workday/workdays of the planning calendar according to the workdays defined in the factory calendar.

– *weekdays*

> Example: period start on every second Wednesday from a particular start date

9. Choose ✔.

> In the screen area *Calculation rule for period specification*, the system asks you to specify the parameters of the corresponding calculation rule.

10. Enter data as required.

11. Choose ⊕ *Calculate periods*.

> The system displays the *New dates* dialog box.

> The system displays a start date in the *Valid from* field. You can change the date here, if necessary.

> In the *Valid to* field, the time period that results from the minimum period is displayed. Here, you enter the date up until which the system is to calculate the periods.

12. Choose ✔.

> The system then displays the calculated periods.

> 💡

> The number of the displayed periods is used in the stock/requirements list for the period totals display, if the display is set according to a planning calendar.

13. Save your entries.

Creating Planning Calendars without Calculation Rule

1. Proceed as described in Creating Planning Calendars with Calculation Rule [Page 31] under points 1 to 7.

2. Choose ✎ *Periods*.

3. Enter the start and finish dates as well as the number of periods.

   If you enter only start dates, the finish dates are automatically calculated by the system (except for the last finish date).

   If you only enter finish dates, the system will automatically calculate the start dates.

4. Save your entries.

Changing the Planning Calendar

1. Starting from the *MRP* menu choose *Master data* → *Planning calendar* → *Change periods*.

    The initial screen for planning calendar maintenance now appears.

2. Enter the plant for which the planning calendar is to be valid.

3. Choose *Calendar overview* or *Calendar no longer valid.*

    Calendar overview: the system displays all the planning calendars available in the system.

    Calendar no longer valid: the system displays all calendars, for which the minimum period independent of the *Valid to* date has been exceeded, and suggests them for reprocessing.

4. Select one or more planning calendars and choose ✔.

    The first selected planning calendar now appears. Here, you can carry out the necessary changes.

Function	Menu path	What you should know
Calculating new periods	*Change calculation rule*	Proceed as described in Creating Planning Calendars with Calculation Rule [Page 31].
Adding periods	🖊 *Periods*	Choose *New entries*.
Inserting periods	🖊 *Periods*	Position the cursor on the line where you want to insert a new period. Choose *Edit* → *Insert* and enter a new period end and a new period start.
Changing periods	🖊 *Periods*	Overwrite the *From date* or the *To date*.
Deleting periods	🖊 *Periods*	Position the cursor on the period that you want to delete. Choose *Edit* → *Delete*.
Fixing periods	🖊 *Periods*	Select the *fixing indicator* for the period(s) to be protected. Fixed periods are not changed if you instruct the system to automatically calculate new periods.

5. Save your entries.

    If you selected several calendars in the overview, the system now automatically displays the next planning calendar that you selected.

Quota Arrangements

Use

If a material can be obtained from **various sources of supply**, each individual source of supply can be allocated a **quota arrangement**. The quota arrangement is valid for a certain period of time and specifies exactly how the receipts are to be distributed amongst each source of supply.

You can set the quota arrangement for **in-house production** as well as for **external procurement**. Sources of supply can be:

- an individual vendor or outline agreement

- another plant, from which material should be procured

- a production version

Prerequisites

- You have maintained the **quota arrangement usage** for the respective material in the material master (*MRP 2* view).

   The quota arrangement usage determines whether a material is included in a quota arrangement and which operations lead to a quota arrangement. You can define, for example, that only purchase orders are included in quota arrangements or that procurement proposals created by the system in the planning run are also included.

   You define the quota arrangement usage in Customizing for Purchasing in the IMG activity *Define quota arrangement usage*.

- You have maintained the **quota file** for the material.

   You define the **sequence** of the sources of supply, the **quotas** per source of supply and numerous other parameters in the quota file.

Features

During the planning run, the system determines the sources of supply according to the quota file and assigns the procurement proposals to the sources of supply.

   In external procurement, the procurement proposal is allocated to the appropriate vendor. This vendor is copied to the purchase requisition.

For every procurement proposal with a quota arrangement, the system updates the **quota file**, so that the quota arrangement is always based on the current situation.

Two procedures are available:

- **Allocation quota arrangement**: every lot is assigned to a source of supply

- **Splitting quota arrangement**: a lot is split among various sources of supply

Further functions are also available for controlling quota arrangements. For example, you can set a maximum release order quantity that defines the maximum delivery capacity of one particular vendor.

Allocation Quota Arrangement

Use

Using this procedure, you **assign an exact source of supply** to every lot, if you have not entered a *maximum lot size* or *maximum release quantity* in the quota file.

Features

The assignment is determined using the **quota rating**. The system calculates the quota rating using the following formula:

Quota rating = Quota-allocated quantity (+ quota base quantity) / Quota

The **quota-allocated quantity** is thereby the total quantity, which has been procured for the relevant source of supply up until then.

You can control the quota arrangement using the **quota base quantity** without having to change the quota, if, for example, a new source of supply is to be added to the quota arrangement .

The **quota** is the percentage rate that defines which part of an occurring requirement is to be taken from a source of supply.

The source of supply, which has the lowest quota rating, receives the complete lot. The quota rating determines the sequence according to which the sources of supply are chosen.

Example for Allocation Quota Arrangement

$$\text{Quota rating} = \frac{\text{Quota-allocated quantity} + \text{Quota base quantity}}{\text{Quota}}$$

Reqmt 1:　　**1000 pieces**

Source of supply	Quota	Quota-allocated quantity	Quota base quantity	Quota rating
1	25	500	--	20
2	75	3000	--	40

Reqmt 2:　　**1000 pieces**

Source of supply	Quota	Quota-allocated quantity	Quota base quantity	Quota rating
1	25	1500	--	60
2	75	3000	--	40

The first procurement proposal is allocated to item 1, and the second procurement proposal to item 2.

Splitting Quota Arrangement

Use

You can use the splitting quota arrangement to distribute a procurement proposal **among various sources of supply**, that is, split them up.

Prerequisites

In the material master (*MRP* 1 view), you have assigned a **lot-sizing procedure with splitting quotas** for the materials to be included in this procedure.

> This quota arrangement logic with the splitting quota is set in Customizing per lot-sizing procedure.

Features

Order Quantity Calculation

The order quantity is calculated according to the following formula:

(Quota source of supply X * Requirement quantity) / Total of all quotas

The quota-allocated quantity of a source of supply or the quota rating is not relevant for the splitting quota.

The system splits the requirements according to the sequence that is defined by the quota, that is, the vendor with the highest quota is selected first. The sequence defined by the quotas can be overruled by priorities. This means that vendors that have been allocated priorities are always selected first. The quantity, however, is always calculated according to the formula above using the quotas.

Determining a Minimum Quantity for Splitting

The **minimum quantity** for the splitting quota determines that the lot has to amount to the minimum quantity (at least) before it can be split.

If a requirement is smaller than the minimum quantity, the system only selects the vendor whose turn it is according to the quota arrangement calculation, that is, it is processed on the basis of the allocation quota arrangement procedure and is not split.

If a requirement quantity has already been split and the remaining quantity causes a lot that is smaller than the minimum quantity, the system does not further split this quantity. The remaining quantity is assigned to the source of supply with the lowest quota rating.

See also:

Lot-Sizing Procedures [Page 64]

Example for Splitting Quota Arrangement

Example Data

Minimum quantity	400
Requirement	1000
Lot size	Lot-for-lot order quantity

	Quota
Vendor A	40
Vendor B	30
Vendor C	20
Vendor D	10

Order Quantity Calculation

Vendor A receives the first order due to having the highest quota. The quantity results from the above-mentioned formula with 40* 1000 / 100 as 400 pieces.

There is a remaining quantity of 600 pieces. Vendor B receives the next order with the quantity 30 * 600 / 60 as 300 pieces. As A has already been used, that quota is not taken into account.

There is a remaining quantity of 300 pieces. As the value is smaller than the minimum quantity, the system does not split it further. The system assigns the complete remaining quantity to vendor D, as this vendor has the lowest quota rating.

Lot Size and Rounding Profile in Quota Arrangement

Use

You can maintain a minimum lot size, a maximum lot size and a rounding profile for each quota item.

Integration

The minimum lot size, maximum lot size or rounding profile that you have maintained in the quota item override the entries in the material master and are valid for the assigned sources of supply. If you have maintained the minimum or maximum lot size in the material master, the values that you have entered there are valid for all sources of supply.

Features

Minimum Lot Size

The minimum lot size defines a **minimum quantity** for the procurement proposal. If a source of supply is determined on the basis of the quota arrangement logic, for which a minimum lot size has been entered and if the requirement quantity is smaller, the system creates the procurement proposal for the amount of the minimum quantity.

Maximum Lot Size

The maximum lot size determines the **largest possible quantity** for the procurement quantity. If a requirement exceeds the maximum lot size recorded for the quota item, then several procurement proposals are created for the maximum lot size until the total requirement is covered. If there is a remaining quantity that is smaller than the maximum lot size, the last procurement proposal is created to cover the amount of this rest quantity.

> After each procurement proposal is created, the quota arrangement is restarted, that is, the quota rating is recalculated to check which source of supply is to be used next. If the quota of a source of supply is high, then it can be used, if necessary, to create several procurement proposals for the maximum lot size.

"Only Once" Indicator

To avoid a situation where more than one order proposal is created per requirement for a source of supply, with the maximum lot size, you can set the *Only once* indicator for this particular source of supply. This source of supply is then only used once per requirement.

> It only makes sense to use the *Only once* indicator in combination with the maximum lot size.

Rounding Profile

If a quota item with a rounding profile is selected, then the quantity of the procurement proposal is adjusted according to the rounding profile.

Lot Size and Rounding Profile in Quota Arrangement

Example for Maximum Lot Size

Example Data

Requirement	1000 pieces
Lot size	Period lot size with weekly grouping

	Quota	Maximum lot size	Previous quota-allocated quantity	*Only once* indicator
Vendor A	80	200	200	X
Vendor B	15		200	
Vendor C	5		200	

Order Quantity Calculation

The quota rating of vendor A is the lowest. Therefore, vendor A receives a procurement proposal for 200 pieces due to the maximum lot size.

The quota rating is then recalculated. Although the quota-allocated quantity has increased to 400 for vendor A, the quota rating for this vendor is still smaller than for the other two vendors. According to this, the next procurement proposal (200 pieces) would go to vendor A again. However, as the *Only once* indicator is set, vendor A cannot be used a second time. The system assigns the next procurement proposal to vendor B, as this vendor has the next lowest quota rating. Therefore, the next procurement proposal is made for vendor B for 800 pieces as no maximum lot size has been set for this vendor.

With the *Only once* indicator, you achieve a situation where vendor A only receives one procurement proposal per week (due to the weekly grouping of the period lot size) for a maximum of 200 pieces (for example, due to limited capacity). With this type of capacity monitoring, quantities that have already been released are not taken into consideration.

Priority and Maximum Release Quantity per Period

Features

Priority

Using the priority function, you can define the **sequence of sources of supply** irrespective of the quota rating and thus, **irrespective of the quota-allocated quantity**. If several sources of supply have priorities, then the source of supply with the smallest number in the priority field is selected first. Only once all the sources of supply with priorities have been selected, does the system then select the sources of supply with no priorities. Then, the system implements the normal logic for quota arrangements using the quota rating (see Allocation Quota Arrangement [Page 37]).

Maximum Release Quantity

The maximum release quantity defines the **maximum available capacity** of a source of supply and thus makes it possible to monitor capacities.

The maximum release quantity is defined for a certain period of time. In addition, you enter the number of periods for which the release quantity is valid, for example, a quantity of 200 pieces per week. The system checks whether the there are firmed receipts (firmed purchase requisitions and planned orders, firmed schedule lines, production orders, purchase orders) in the specified period that have already been scheduled or allocated and compares this quantity with the maximum release quantity.

If more firmed receipts are scheduled in a certain period than the maximum release quantity allows, then this source of supply is no longer used. Here, the system always checks using the availability date of the MRP element. For newly created procurement proposals, the system uses the requirement date of the source requirement.

If a certain percentage of the maximum release quantity has already been used for a source of supply and a further requirement occurs that exceeds the remaining quantity, then the system splits the requirement quantity. Another procurement proposal is created for this source of supply for the difference between the release quantity and the order proposal quantity. The rest of the requirement quantity is allocated to the next vendor whose turn it is according to the quota rating logic.

Example for Priority and Maximum Release Quantity

This example only applies to the **allocation quota arrangement**, that is, a splitting quota arrangement is not defined. You thus allocate every lot to one source of supply.

Example Data

In the procurement procedure for a particular material, you have a preferred vendor A that is always to be selected first. However, this vendor can only deliver 100 pieces per week. If you require more than 100 pieces, then the remaining quantity is to be procured from vendor B. However, this vendor also has a limited capacity and can only deliver 200 pieces per week. If you require more than 300 pieces in a week, the remaining quantity is to be divided between vendors C and D in the ratio 70 : 30.

The sources of supply are maintained as follows:

	Quota	Priority	Maximum release quantity
Vendor A		1	100
Vendor B		2	200
Vendor C	70		
Vendor D	30		

Allocation Quantity Calculation

The requirement quantity amounts to 1000 pieces.

The system selects vendor A first. However, due to the limited capacity situation, he only receives a procurement proposal for 100 pieces. Vendor B is then used. He receives an order proposal for 200 pieces. The **remaining** 700 pieces are **supplied by** either vendor C **or** D, depending on whose quota rating is the lowest.

This represents the typical procedure unless other purchase orders or firmed receipts already exist for vendors A or B in the week that the new procurement proposals are created. If, for example, a purchase order already exists for vendor A in this week for 100 pieces, then this vendor is no longer taken into account. If a purchase order for 40 pieces already exists, then he receives another order proposal for 60 pieces. The remaining quantity is distributed further.

Maintaining the Quota File

You can maintain the quota file in Purchasing or MRP. In this section, a description is given of how to maintain this file from Material Requirements Planning.

1. Starting from the *MRP* menu, choose *Master data → Quota maintenance*.

   The initial screen for maintaining quota appears.

2. Enter the material number and the plant for the material that you want to use to maintain the quota file and choose ✔.

   The header screen for maintaining quotas appears.

3. Enter the *Valid to* date for the quota arrangement item.

   You can only define continuous validity periods for one material. In the first interval, the system sets the current date in the *Valid from* field. The *Valid from* dates of the other intervals are set continuously so that the day after the end date of the last quota item is set as the start date for the next item.

4. If you want to work with splitting quota arrangements, enter a minimum quantity here.

5. Double-click on the item that you want to process.

   The item screen now appears.

6. Define the source of supply and other control parameters per item.

   Allocating the source of supply to the quota item determines the procurement type that the procurement proposal receives. Therefore, you can specify via the quota arrangement that, for example, 60% of a material is produced in-house and the other 40% is procured externally.

7. Save your entries.

Planning Processes

Purpose

This process describes the business processes and the technical system processes involved in consumption-based planning:

Process Flow

In the planning run, the system carries out the following partial processes:

1. The system checks the **planning file entries.** Here, the system checks to see whether a material has been changed in some way relevant to MRP and should therefore be included in the planning run (see Checking the Planning File Entries [Page 49]).

2. The system carries out a **net requirements calculation** for every material. Here, the system checks to see whether the requirement quantity is covered by available warehouse stock and fixed receipts from Purchasing or production. If the requirement quantity is not covered, the system creates a procurement proposal (see Net Requirements Calculation [Page 60]).

3. Then the system carries out the **lot-sizing calculation**. Here, the system takes the **lot-sizing procedure** and, if necessary, the **rounding up or down** values into account (see Lot-Sizing Calculation [Page 63]).

4. The system carries out **scheduling** to calculate the start and finish dates of the procurement proposals (see Scheduling [Page 87]).

5. The system determines the type of **procurement proposals**. Depending on the settings, the system creates either **planned orders, purchase requisitions or schedule lines** for a material (see Determining the Procurement Proposal [Page 92]). If you have maintained the necessary specifications for **procurement quota arrangements**, the system determines the **source of supply** which it assigns to the procurement proposal (see Quota Arrangements [Page 95]).

6. The system recognizes **critical situations** which the planner has to processes manually in the planning results. For this purpose, the system creates **exception messages** and carries out a **rescheduling check** (see Creating Exception Messages [Page 101] and Rescheduling Check [Page 102]).

7. It also calculates the **actual days' supply and the receipt days' supply** (see Days' Supply and Receipt Days' Supply [Ext.] and Actual Coverage [Ext.]).

MRP is usually carried out at plant level. There are also the following options:

Storage Location MRP [Page 107]

Planning With MRP Areas [Page 114]

Multi-plant planning with stock transfer

Result

After the planning run, the planner can check and process the procurement elements. Various evaluations are available for this purpose.

See also:

Evaluating the Planning Result [Ext.]

Planning Processes

Checking the Planning File

Implementation Options

The first process in MRP is the checking of the planning file.

The planning run and the scope of the planning run (which materials are planned in which planning run) are controlled by the planning file.

The planning file contains a list of all materials relevant to the planning run. As soon as a material master record is created with MRP data and a valid MRP type, this material is then automatically included in the planning file.

Prerequisites

The planning file has been set up and includes all materials relevant to MRP.

Process Flow

1. The system checks whether the material to be planned is included in the planning file, that is whether the material number is in the *planning file* and whether the NETCH or NETPL indicator has been set for *net change planning or net change planning in the planning horizon* (see also Planning Run Types and Scope of Planning [Page 51]).

2. The system reads the low-level code. The low-level code defines the sequence in which the materials are to be planned. The system plans materials with the low-level code 000 first and then those with 001, and so on. (See also Calculating Low-Level Codes [Page 55]).

3. The system checks whether the BOM is to be re-exploded due to existing procurement proposals. The system re-explodes the BOM if an X has been entered in the *BOM explosion* column of the planning file.

4. The system checks whether procurement proposals existing since the last planning run for a material are to be deleted and recreated. The system does this if an X has been entered in the *Reset Order Proposals* column (see also Planning Mode [Page 53]).

5. The system reads the MRP date in addition to the planning file entry if time-phased planning or MRP combined with time-phased planning is used. The MRP date is copied from the planning calendar and determines when planning is to be carried out for the material.

6. The system checks whether the material is a master schedule item. The system does this if an X has been entered in the *MPS Item* column of the planning file. This indicator is set if the material has an MRP type for master production scheduling.

Individual Customer Planning File Entries

Use

If you create or change the configuration or the sales order BOM for a sales order, the system then creates an individual customer planning file entry. In the planning run, only the planned orders for the changed sales orders are re-exploded, that is to say, not all the planned orders for all the sales orders. System performance is thus improved.

Integration

The individual customer planning file entries have their own individual customer planning file. This file differs from the planning file only due to the additional fields: sales order number and sales order item.

> You cannot display individual customer planning file entries.

Features

The system checks whether an individual customer planning file entry exists for a material that is to be planned. If this is the case, only the planned orders that belong to the changed sales order are re-exploded. This also applies for the subordinate components.

After the planning run has been carried out, the individual customer planning file entries are deleted.

Planning Run Type

Use

The planning run type determines which materials are to be planned:

- Regenerative planning (NEUPL)

    The system plans all the materials that are contained in the planning file

- **Net change planning** (NETCH) or **Net change planning in the planning horizon** (NETPL)

    The system only plans materials that have undergone a change relevant to MRP since the last planning run

You choose the required planning run type in the initial screen of the planning run (see Planning Run Type in Initial Screen [Page 140]).

Features

Net Change Planning (NETCH)

In net change planning only those materials are planned for which the net change planning indicator in the planning file has been set as a **planning file entry**. The system usually sets the indicator automatically as soon as a change is made to the material that is relevant to MRP.

The following changes cause an entry in the planning file to be made:

- Changes to stock, if these change the stock/requirements situation of the material

- Creation of purchase requisitions, purchase orders, planned orders, sales requirements, forecast requirements, dependent requirements or reservations

- Changing to fields that are relevant to the planning run for these receipts and issues or in the material master

- Deleting receipt or issue quantities

    ⚠️

    If you have changed the settings of an MRP type, a lot-sizing procedure or a purchasing department processing time in Customizing, the materials that are affected by these changes thus have no planning file entry and are not included automatically in the net change planning. To enable the changes made to take effect, you choose *regenerative planning* in the initial screen of the planning run or make an entry manually in the planning file.

Net change planning in the planning horizon (NETPL)

You can also use a **planning horizon** to further limit the scope of the planning run. In "net change planning in the planning horizon", the system only plans materials that have undergone a change that is relevant to the planning run within the period which you defined as the planning horizon. The system sets the *net change planning horizon*

Activities

- During the planning run, the system checks every entry for a material in the planning file:

Planning Run Type

– In a **regenerative planning run**, the system plans all materials which are included in the planning file irrespective of all indicators.

– In a **net change planning run**, the system only plans those materials which are provided with the net change planning indicator.

– In **net change planning in the planning horizon**, the system only plans those materials provided with the net change planning horizon indicator.

- On completion of the planning run, the appropriate indicator is automatically deleted in the planning file:

– The system deletes the net change planning indicator and the net change planning horizon indicator for a regenerative planning run and a net change planning run.

– The system only deletes the net change planning horizon indicator for a net change planning run in the planning horizon

If a termination occurs when planning a material, the indicators for this material remain in the planning file so that the material is planned again in the following net change planning run. However, depending on the error, you can manually delete the indicators in Customizing for MRP in the IMG activity *Define Error Processing in the Planning Run* if necessary (for example, if a certain material is not available in the planning plant). This means that you can avoid a situation where materials are pointlessly planned again and again.

Planning Mode

Use

The planning mode controls 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.

Usually, the master plan is adjusted in the planning run to adapt it to either new dates or quantities. If a requirements quantity was increased, the system automatically adjusts the quantity of the corresponding procurement proposal. If changes are made in the BOM or material master, the planning mode controls whether or not these changes will have an effect in planning.

Features

The planning mode is set automatically in the planning file. However, you can overwrite it in the initial screen of each planning run.

Planning Mode in the Planning File

- **Planning Mode 1**

  Planning mode 1 is if you have only set the planning file entries (*net change planning* indicator and *net change planning horizon* indicator*)* in the planning file for a material (see Planning Run Type [Page 51]).

  In the planning run in planning mode 1 the system reactivates the existing planning data, that is, procurement proposals that are not firmed remain on the database and are only then adapted, if the dates and quantities do not suit the new planning situation. The system only re-explodes the BOM for adjusted procurement proposals. System performance is thus improved.

  Example of changes that cause planning mode 1 to be set:

  – Changes in date and quantity

  – Requirement changes

  – Changes in the lot-sizing procedure or MRP type

- **Planning Mode 2**

  Planning mode 2 is if a material has planning file entries and the *Re-explode BOM* indicator is also set in the planning file.

  In the planning run in planning mode 2, the system re-explodes the BOMs for all existing procurement proposals that are not firmed and also for those, for which the dates and quantities do not have to be adjusted.

  Example of changes that cause planning mode 2 to be set:

  – Changes to the material BOM

  – Changes to the sales order BOM

  – Changes to the phantom assembly BOM

  – Changes to references assigned within BOM

  – Changes to material classification

Planning Mode

– Change of production version in material master or planned order

– Change or conversion of BOM explosion number

- **Planning Mode 3**

   Planning mode 3 is if a material has planning file entries and the *Reset order proposals* indicator is also set in the planning file.

   In planning mode 3 existing procurement proposals that are not firmed are completely deleted from the database and recreated. The system then re-explodes the BOMs.

   Example of changes that cause planning mode 3 to be set:

   – In-house production time

   – Planned delivery time

   – Scheduling margin key

   – MRP controller

- **No Planning File Entry**

   The following types of changes do not cause a planning file entry:

   – **Customizing**, such as changes in purchasing department processing time in the plant parameters

   – **MRP-relevant changes to the routing**, such as change in the standard time

Planning Mode in Initial Screen of the Planning Run

The planning mode set in the planning file for a material can be overruled by the planning mode in the initial screen of the planning run. For more information, see .

Calculating Low-Level Codes

Implementation Options

Materials may appear in several products and in several production levels of a product. The **low-level code** represents the **lowest level of usage** of a material within all product structures.

It determines the sequence in which the materials are planned. The system plans materials with the low-level code 0 first and then those with 1 and so on. The lower the low-level code is, the higher the number assigned to the level.

Prerequisites

You have created BOMs for the materials that you want to plan.

Process Flow

Planning direction
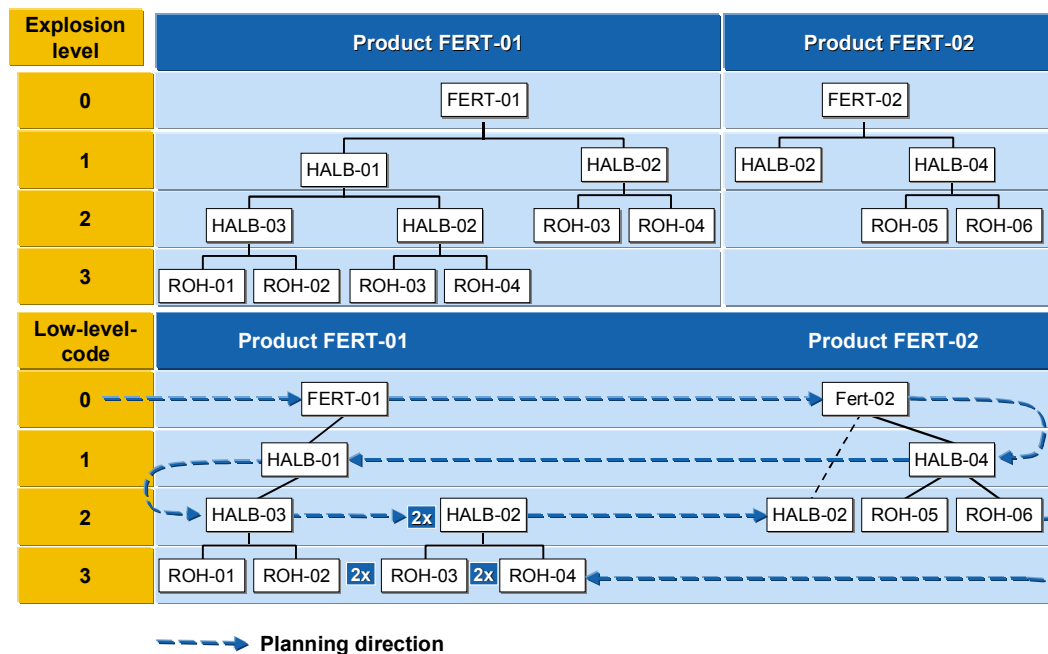
Result

The low-level code is stored in the BOM management program in the material master (*Additional data,* 🛈) and is entered in the planning file.

Displaying the Planning File

1. Starting from the *MRP* menu choose *Planning → Planning file entry → Display*.

   The initial screen for displaying planning file entries now appears.

2. Enter your selection criteria:

   If you leave the m*aterial, MRP area, plant* and *low-level code* fields blank, the system selects all materials in all MRP areas and all plants.

3. Choose ✅.

   The system displays a list of all the materials that fulfill your selection criteria.

   − The record type of the planning file entry is given in column RT. MRP materials are automatically provided with a *B* and phantom assemblies with a *D*.

   − In the *low-level code* column, you can see the respective low-level code of the material. In the material master record, each material is allocated one low-level code (field L.Lvl Code) which is determined by the bill of material (BOM) management program. You can also display the low-level code in the material master (*Additional data*, 🛈).

      If a material does not appear in a bill of material, the system will automatically allocate the highest level (999).

   − In the *MPS item* column, the indicator for a master schedule item is set.

   − If the *Net change planning* indicator is set for a material then it is included in the net change planning run.

   − If the *Net change planning horizon* indicator is set for a material then this material is included in the net change planning in the planning horizon.

   − If you set the *BOM explosion* indicator, then available planned orders are taken over but the BOM is re-exploded and the routing re-released.

   − If you set the *Reset order proposal* indicator, then planning dates that may be available are always deleted and recreated.

4. Choose 🔧 *Statistics*.

   A window with statistical data appears. Here you see how many materials have been selected in total and how many of these exist for each of the indicators mentioned above.

Setting Up the Planning File

Use

If a material was created before the planning run was activated for a plant, you must generate an entry in the planning file for all materials in this plant that are to be included in the planning run.

> This function can only be carried out in background mode.

Procedure

1. Starting from the *MRP* menu choose *Planning → Planning file entry → Set up in background*.

   The initial screen for the setting up of planning file entries appears.

2. You can use a selection variant to plan the creation of planning file entries at a later date, or you can start the process immediately.

3. Once you have started the process, the system checks each material in this plant to see whether it is relevant for MRP. If a material fulfills the appropriate prerequisites, it is included in the planning file and either the *net change planning* indicator or the *net change planning horizon* indicator is set.

Result

These materials are then included in the following MRP run.

Creating Entries in the Planning File Manually

Use

Planning file entries are usually set automatically by the system. In some exceptional cases, however, you may find it necessary to make an entry in the planning file manually.

Procedure

1. Starting from the *MRP* menu choose *Planning → Planning file entry → Create*.

    The screen for creating a planning file entries now appears.

2. Enter the material number and plant or MRP area as well as, if required, further planning indicators.

3. Choose ✔.

Result

The system checks the relevancy of the entered material for MRP and confirms the successful entry in the planning file.

Check the Consistency of the Planning File

Use

Since the entries in the planning file are permanent, you must check their MRP relevancy regularly. If, for example, a plant is subsequently excluded from material requirements planning, its materials will still be included in the planning file. The same applies for materials that are subsequently flagged with the MRP type *No MRP* and are thus excluded from MRP. In such cases, you should delete the entries in the planning file.

Procedure

1. Starting from the *MRP* menu choose *Planning* → *Planning file entry* →*Consistency check*.

    The initial screen for checking consistency now appears.

2. By using a selection variant, you can either plan the consistency check of the planning file entries to take place at a later date or you can start the process immediately.

3. Once the consistency check has started, the system checks each entry for the following information:

    –   Does the material still exist, that is, does a material master record still exist for the material?

    –   Is material requirements planning activated for the plant?

    –   Does the material have a valid MRP type in the material master?

    –   Does the low-level code still match the one in the material master?

Result

If one of these criteria no longer applies, the respective entry is deleted from the planning file.

If the low-level code no longer corresponds to the one in the material master record, the entry is deleted from the planning file and a new one is created with the current low-level code.

Net Requirements Calculation

The net requirements calculation is carried out in MRP in the planning run after the planning file check and at plant level. The system checks whether it is possible to cover requirements with the plant stock and fixed receipts already planned. In the case of a shortage the system creates a procurement proposal.

Process Flow

1. The system calculates **plant stock**. For all storage locations which belong to this plant and which are not excluded from materials planning or are planned separately, the following stocks are grouped together to form plant stock:

   – Unrestricted-use stock

   – Stock in quality inspection

   – Unrestricted-use consignment stock

   – Consignment warehouse stock in quality inspection

   In Customizing for MRP in the IMG activity *Availability of Stock in Transfer/Blocked Stock/ Restricted Stock*, you can also determine whether stock in transfer, blocked stock and restricted-use stock are included in the plant.

2. The system also takes into account all the **goods issues and receipts** for a material. Receipts are, for example, planned orders or purchase requisitions and issues are, for example, customer requirements, planned independent requirements, or reservations.

3. Therefore, the system checks to make sure that for each issue date, the requirement is covered by one or several receipts or by warehouse stock. If this is not the case, the system then calculates the shortage quantity and creates a procurement proposal. The lot-sizing procedure, scrap and rounding determine the quantity in the procurement proposal (see Calculating Procurement Quantity [Ext.]).

   The net requirements calculation supports the following types of planning: Reorder point planning, forecast-based planning, material requirements planning (MRP). In each procedure, the system calculates the available stock differently.

Net Requirements Calculation for Reorder Point Planning

Use

In **reorder point planning**, the net requirements calculation is only carried out once **the stock level has fallen below the reorder level**. Issue elements, such as, customer requirements, planned independent requirements, or reservations are only displayed and are not included in the net requirements calculation.

Prerequisites

You have set an MRP type for the material in the *MRP Type* field in the material master (View *MRP 1*) to *Reorder point planning, for example VB or VM*.

Features

Available warehouse stock is calculated as follows:

	Plant stock
+	Open order quantity (purchase orders, firmed planned orders, firmed purchase requisitions)
=	Available stock

If available warehouse stock falls short of the reorder level then the shortage quantity is the difference between these two.

The system specifies the date of the planning run as the requirements date.

> Safety stock is ignored when calculating the shortage quantity. However, if stock should fall below the safety stock level, the MRP controller receives an exception message.

Net Requirements Calculation for Forecast-Based Planning

Use

The basis of **forecast-based planning** is the **forecast of the total requirements**. The system only considers the forecast requirement quantities as issues. Other issue elements, such as, customer requirements, planned independent requirements, or reservations are only displayed and are not included in the net requirements calculation. The system checks every forecast requirement to determine whether it is covered by available warehouse stock and/or receipts (purchase orders, firmed procurement proposals).

Prerequisites

You have set an MRP type for the material in the *MRP Type* field in the material master (View *MRP 1*) to *forecast-based planning*.

Features

Available stock is calculated as follows:

	Plant stock
–	Safety stock
+	Receipts (purchase orders, firmed purchase orders)
–	Requirements quantity (forecast requirements)
=	Available stock

A shortage occurs if available stock is negative, that is, the requirements quantity is greater than expected receipts.

The system specifies the forecast requirements date as the requirements date. In this case, it assumes that forecast requirements are needed at the beginning of the period. This means that the requirements date is the first workday of the respective period.

> If the requirements of a particular period are not to be set on the first workday, but are to be evenly distributed over the period instead, select the splitting function of the forecast requirements (see *Define Splitting of Forecast Requirements for MRP* in the documentation for Consumption-Based Planning.

Lot-Size Calculation

Purpose

The lot-size calculation is carried out in MRP. In the net requirements calculation, the system determines material shortages for each requirement date. These **shortage quanities** must be covered by receipt elements. The system then calculates the quantities required for the receipts in the planning run in the procurement quantity calculation.

Prerequisites

- You must define the appropriate lot-sizing procedure in Customizing for MRP in the workstep *Checking the Lot-sizing Procedure*.

- You assign the appropriate lot-sizing procedure to the material in the material master record (MRP view 1) and, if necessary, you must specify additional restrictions.

  - Minimum lot size (minimum procurement quantity per lot)

  - Maximum lot size (maximum procurement quantity per lot)

  - Rounding value (quantity rounded up to a multiple of this value)

  - Rounding profile (staggered rounding)

- In the material master record or in the BOM, you must enter the values for the scrap calculation.

Process Flow

1. The system compares the shortage quantity calculated with the parameters of the lot-sizing procedure chosen and so calculates the lot size.

2. If you have specified a **rounding value** or a **rounding profile**, the system rounds up the lot size and thus calculates the **procurement quantity**.

Result

The result of the lot-size calculation is the quantity to be produced or procured. You can display and change the procurement quantity in the procurement proposal.

Lot-Sizing Procedures

Use

Lot-sizing procedures serve to calculate the procurement quantities, that is, the purchase order and production quantities.

Integration

- You define lot-sizing procedures in Customizing for MRP in the IMG activity *Check lot-sizing procedure*.

- You assign the required lot-sizing procedure to the material in the *Lot size* field in the material master (*MRP 1* view).

Features

Three groups of lot-sizing procedures are available:

- Static lot-sizing procedures

- Period lot-sizing procedures

- Optimum lot-sizing procedures

You can also use the **short-term and long-term** lot size to divide the planning period for the lot-size calculation into a short-term and a long-term area. Therefore, it is also possible to use a different lot-sizing procedure for calculating the lot size in each of these areas.

The **last lot** can be planned **exactly**, independent of the selected lot-sizing procedure.

Static Lot-Sizing Procedures

Use

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

Features

The following static lot-sizing procedures are available:

- Lot-for-lot order quantity

- Fixed lot size

- Fixed lot size with splitting and overlapping (see Lot Sizes with Splitting and Overlapping [Page 81])

- Replenishment up to maximum stock level

Lot-for-Lot Order Quantity

Use

You plan using lot-for-lot order quantity, when you want to procure the exact lot size again.

This procedure is also referred to as the lot-for-lot procedure.

Prerequisites

You have set the indicator EX for lot-for-lot order quantity in the *Lot size* field in the material master (*MRP 1* view) for the material.

Features

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. At the time of the requirements date, the planned plant stock is zero.

Planning is carried out daily. The system groups requirement quantities from the same day together in one procurement proposal.

Fixed Lot Size

Use

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**.

Prerequisites

You have set the indicator *FX* and entered the fixed lot-size quantity in the *Lot size* field in the material master (*MRP 1* view) for the material.

Features

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.

> You can specify a threshold value for the maximum number of order proposals for the fixed lot size in Customizing for MRP in the IMG activity *Define error processing in the planning run*. If this value is exceeded, that is, if too many procurement proposals are created for a date and for a material, the material is provided with a termination message.

Replenishment up to Maximum Stock Level

Use

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.

Integration

⚠️

You can use this lot-sizing procedure with reorder point planning or MRP.

Prerequisites

You have set the indicator *HB* in the *Lot size* field and the maximum quantity to stock in the *Maximum stock level* field in the material master (*MRP 1* view) for the material.

Features

- In **material requirements planning**, the system creates an order quantity to bring the stock level up to the maximum stock level. If, however, the requirements for one day are greater than the maximum stock level the system creates an order quantity for the required quantity. In this case, a balanced stock/requirements situation is given higher priority than the lot-sizing procedure.

- In **reorder point planning without taking external requirements into account** you only use stocks. MRP then calculates the lot sizes as follows:

	Maximum stock level
–	Current plant stock
–	Existing fixed receipt elements
=	Lot size

- In **reorder point planning where external requirements are taken into account**, where additional requirements are also included in the calculation, MRP tries to achieve two goals:

    - All requirements must be covered

    - Once requirements have been covered, the defined maximum stock level must not be exceeded, but also does not have to be reached

The requirements dates are not taken into account. The system calculates the total of all requirements.

The calculation of the lot size occurs in two steps using two formulas:

Formula 1

```
      Maximum stock level

  –   Current plant stock

  ⁻   Existing fixed receipt elements
  _____

  =   Lot size
```

Formula 2

```
      Reorder point

  +   Total requirements (or total requirements in replenishment
      lead time)

  ⁻   Current plant stock

  ⁻   Existing fixed receipt elements
  _____

  =   Lot  size
```

The system creates the order proposal using the greater of the two lot sizes calculated.

- For **reorder point planning where external requirements are taken into account** as well as **MRP** there is an additional option, whereby you can set the *Maximum stock level variant 1 (Maximum stock level after covering requirement).* The MRP thus tries to achieve the following two aims:

  – All requirements must be covered

  – The defined maximum stock level must be reached after covering the requirements

  The system calculates the lot size using the following formula:

```
      Reorder point

  +   Total requirements

  ⁻   Current plant stock

  ⁻   Existing fixed receipt elements
  _____

  =   Lot size
```

Example

Example Data

Maximum stock level	5.000
Reorder point	2.000
Current plant stock	1.000

Replenishment up to Maximum Stock Level

Existing fixed receipt elements	None
Total requirements	4.000

Lot-Size Calculation

1. Reorder point planning without taking external requirements into account	5.000 - 1.000 = **4.000**
2. Reorder point planning where external requirements are taken into account	Formula 1: 5.000 - 1.000 = 4.000 Formula 2: 2.000 + 4.000 - 1.000 = **5.000** (this value is the larger and is copied over)
3. Reorder point planning where external requirements are taken into account or MRP, **maximum stock level variant 1**	5.000 + 4.000 - 1.000 = **8.000**

Period Lot-Sizing Procedures

Use

In period lot-sizing procedures, the system groups several requirements within a time interval together to form a lot.

Features

- You can define the following periods:

  - days

  - weeks

  - months

  - periods of flexible length equal to posting periods

  - freely definable periods according to a planning calendar

    The system can interpret the **period start of the planning calendar** as the availability date or as the delivery date.

- Splitting and overlapping are also possible for all period lot-sizing procedures (see Lot Sizes with Splitting and Overlapping [Page 81]).

- The system sets the **availability date** for **period lot-sizing procedures** to the **first requirements date** of the period. However, you can also define that the availability date is at the **beginning or end of the period**.

Availability Date for Period Lot-Sizing Procedure

Use

The system sets the **availability date** for **period lot-sizing procedures** to the **first requirements date** of the period. However, you can also define that the availability date is at the **beginning or end of the period**.

The availability date is the date by which the material must be available for production and includes the goods receipt processing time.

Integration

You define the availability date for period lot-sizing with the *Scheduling* indicator in Customizing.

Features

In the standard system, the availability date for period lot-sizing procedures is set to the first requirements date of the period. From this date, the system subtracts the goods receipt processing time to calculate the delivery date or order finish date for the procurement proposal. The requirements that lie between the period start and end are grouped together into a lot.

If the setting has been made in Customizing for the availability date to be at the beginning or end of the period, the basic dates of the planned order are rescheduled as well as the dependent requirements for the components.

Example for Determination of Availability Date

If you use **period lot sizing** in MRP and set the **availability date as the period start**, the system determines the availability date from the delivery date and the goods receipt processing time. The system then reschedules the availability date to the start of the next period that lies after the calculated availability date.

Example Data

MRP type	Material requirements planning
Lot size: ▪ Lot-sizing procedure ▪ Lot size indicator ▪ Scheduling	 ▪ P (period lot size) ▪ M (monthly lot size) ▪ 1 (Period start = availability date)
Procurement type	F (External procurement)
Planned Delivery Time	20 calendar days
Goods receipt processing time	1 working day
Dependent requirements	29 August, 30 September and 31 October

Planning Result

The planning run was executed on 14 August. The system schedules the following dates:

29.08.	DepReq	2 individual requirements	100,00-
30.09.	DepReq	5 individual requirements	150,00-
01.10.	Pl.ord	0000001000	100,00
01.10.	Pl.ord	0000001001	150,00
01.10.	Pl.ord	0000001002	300,00
31.10.	DepReq	3 individual requirements	300,00-

The system displaces the availability dates for planned orders 1000 and 1001 to the start of the next period possible (1 October) which lies after the date (4 September) determined by forward scheduling.

The date 4 September results from forward scheduling from 12 August + 20 calendar days + 1 day for goods receipt processing time.

Delivery Date Instead of Availability Date

Use

⚠️

You can only use this function with the lot-sizing procedure **Period Lot Size According to Planning Calendar**.

The system normally interprets the **period start of the planning calendar** as the availability date. You can, however, set it to be interpreted as the delivery date.

Prerequisites

You define the setting for the availability date or delivery date for period lot-sizes with the *Interpretation of events* indicator in Customizing.

Integration

⚠️

It is not possible to use the indicator for scheduling together with the interpretation of the planning delivery period as delivery date.

Features

If you set the appropriate indicator in Customizing, the system interprets the period start as the delivery date. The system subtracts the planned delivery time from this delivery date to calculate the release date and then it adds the goods receipt processing time to calculate the availability date. The availability date is thus displaced by the goods receipt processing time.

The grouping of the requirements is also displaced to guarantee that goods are available on time for all requirements. In this case, the requirements are not strictly grouped together within the defined period length, but within the availability dates resulting from displacing the goods receipt processing time.

Example for Delivery Date Instead of Availability Date

Example Data

Planned delivery time	3 days
Goods receipt processing time	2 days
Planning calendar period 1	Tuesday 1 March until Monday 14 March
Planning calendar period 2	Tuesday 1 March until Monday 28 March

The vendor therefore delivers every two weeks on Tuesdays. The planned delivery time means that you must inform the vendor of the required quantity at least 3 days before the delivery date.

Requirements

Planning calendar period 1	Requirement 1 on 3 March for 100 pieces
	Requirement 2 on the 8 March for 70 pieces
Planning calendar period 2	Requirement 1 on 14.03 March for 150 pieces
	Requirement 2 on 16 March for 90 pieces

Example of Delivery Date

For the standard setting (availability date = start of period), the system groups all requirements in period 1 together and creates a procurement proposal for 170 pieces for the start of the period 1, that is for the 1 March.

The availability date of this procurement proposal is 1 March. Starting from here, the system schedules backwards, that is, the goods receipt processing time is subtracted, resulting in the delivery date 28 February. Then the system subtracts the planned delivery time of three days which results in the release date 24 February.

The requirements are grouped together between the period basic dates. This results in a lot of 170 pieces for the 1 March and another lot for 240 pieces for the 12 March.

Example of Delivery Date

With the setting *Interpretation of the Planning Calendar Periods as Delivery Dates,* the delivery date of the first period is 1 March and the delivery date of the second period is 15 March. This means that, including the goods receipt processing time, the requirement on the 15 March can no longer be completely covered, as the availability date of the procurement proposal in the second period is 17 February. Therefore, the requirement of the 15 March must be added to the period lot with the delivery date 1 March.

Thus, for the first period, three requirements are grouped together: the requirement of 3 March, of 8 March and of 15 March for 320 pieces. The procurement proposal for 15 March is created for 90 pieces.

Optimum Lot-Sizing Procedures

Use

In static and period lot-sizing procedures, the costs resulting from stockkeeping, from the setup procedures or from purchasing are not taken into consideration. The aim of optimum lot-sizing procedures, on the other hand, is to group shortages together in such a way that **costs are minimized**. These costs include **lot size independent costs** (setup or order costs) and **storage costs**.

Taking Purchasing as an example, the following problem hereby arises:

If you order often, you will have low storage costs but high order costs due to the high number of orders. If you only seldom place orders then you will find that your order costs remain very low, but your storage costs will be very high since warehouse stock must be large enough to cover requirements for a much longer period.

Features

The starting point for lot sizing is the first material shortage date that is determined during the net requirements calculation. The shortage quantity determined here represents the minimum order quantity. The system then adds successive shortage quantities to this lot size until, by means of the particular cost criterion, optimum costs have been established.

The only differences between the various optimum lot-sizing procedures are the cost criteria. The following procedures are available:

- Part Period Balancing
- Least Unit Cost Procedure
- Dynamic Lot Size Creation
- Groff Reorder Procedure

Part Period Balancing

Use

The part period balancing procedure adheres to the "classic" lot size formula for the minimum costs whereby variable costs (storage costs) are equal to the lot size independent costs.

Prerequisites

In the material master (*MRP 1* view) for the material, you have set the indicator for *SP* for *Part period balancing* in the *Lot size* field and the *Lot size independent costs* and *storage costs indicator*.

Features

Starting from the shortage date, successive requirements are grouped together to form lots until the **sum of the storage costs equals lot size independent costs.** (In other words, this procedure involves an adjustment between costs independent of quantity and costs dependent of quantities and time.)

Example

Price:	$ 20
Lot size independent costs:	$ 100
Storage cost percentage:	10 %

$$\text{Storage costs} = \frac{\text{Reqmt. x Price x Storage.cst.pct. x Time in storage}}{100 \times 365}$$

Requirements date	Reqmts. quantity	Lot size	Lot size ind. costs	Storage costs	Total storage costs
06.07.	1000	1000	100	0	0
13.07.	1000	2000		38,36	38,36
20.07.	1000	3000		76,71	115,07
27.07.	1000	4000		115,07	230,14

Optimum

The most appropriate lot size is 2000 pieces because if further requirements were added to this lot, total storage costs would be larger than the lot size independent costs.

Least Unit Cost Procedure

Prerequisites

In the material master (*MRP 1* view) for the material, you have set the indicator for *WI* for *Least unit cost procedure* in the *Lot size* field and the *Lot size independent costs* and *storage costs indicator*.

Features

Starting from the shortage date, successive requirements are grouped together to form lots until **total costs per unit** reach **a minimum** level. The total costs are equal to the sum of the lot size independent costs plus the total storage costs.

Example

Price:	$ 20
Lot size independent costs:	$ 100
Storage cost percentage:	10 %

$$\text{Storage costs} = \frac{\text{Reqmt. x Price x Storage.cst.pct. x Time in storage}}{100 \times 365}$$

Requirements date	Reqmts. quantity	Lot size	Lot size ind. costs	Storage costs	Total costs	Unit costs
06.07.	1000	1000	100	0	0	0,100
13.07.	1000	2000		38,36	138,36	0,069
20.07.	1000	3000		76,71	215,07	0,072
27.07.	1000	4000		115,07	330,14	0,083

Optimum

The most appropriate lot size is 2000 pieces.

Dynamic Lot Size Creation

Prerequisites

In the material master (*MRP 1* view) for the material, you have set the indicator for *DY* for *Dynamic lot size creation* in the *Lot size* field and the *Lot size independent costs* and *storage costs indicator*.

Features

Starting from the shortage date, successive requirements are grouped together to form lots until **additional storage costs** become **greater than lot size independent costs**.

Example

Price:	$ 20
Lot size independent costs:	$ 100
Storage cost percentage:	10 %

$$\text{Storage costs} = \frac{\text{Reqmt. x Price x Storage.cst.pct. x Time in storage}}{100 \times 365}$$

Requirements date	Reqmts. quantity	Lot size	Lot size-ind. costs	Storage-costs
06.07.	1000	1000	100	0
13.07.	1000	2000		38,36
20.07.	1000	3000		76,71
27.07.	1000	4000		115,07

Optimum

The most appropriate lot size is 3000 pieces because an additional requirement of 1000 pieces for the 27 July would mean that the lot size independent costs would be exceeded.

Groff Reorder Procedure

Use

The Groff reorder procedure is based on the fact that additional storage costs are equal to the saving in lot size independent costs according to the classical lot sizing formula for the minimum costs. Additional storage costs resulting from an increase in the lot size are, therefore, compared with the resulting savings in lot size independent costs.

Prerequisites

In the material master (*MRP 1* view) for the material, you have set the indicator for *GR* for *Groff reorder procedure* in the *Lot size* field and the *Lot size independent costs* and *storage costs indicator*.

Features

Starting from a certain period, the system keeps grouping requirements into a lot **until the increase in the average storage costs per period is larger than the decrease in the lot size independent costs per period.**

Example

Price:	$ 20
Lot size independent costs:	$ 100
Storage cost percentage:	10 %

$$\text{Additional storage costs} = \frac{\text{Reqmt. x Price x Storage.cst.pct x Time in storage}}{100 \times 365 \times 2}$$

$$\text{Savings in lot size ind.csts} = \frac{\text{Lot size independent costs}}{\text{Time in storage x (Time in storage +1)}}$$

Requirements date	Reqmts. quantity	Lot size	Lot size ind. costs	Savings in lot size ind. csts	Additional storage csts
06.07.	1000	1000	100	0	0
13.07.	1000	2000		1,79	2,74
20.07.	1000	3000			
27.07.	1000	4000			

Optimum

The most appropriate lot size is 1000 pieces because for a further requirement of 1000 pieces, additional storage costs would then exceed the savings in lot size independent costs.

Lot Sizes with Splitting and Overlapping

Use

You can determine whether a fixed or period lot size is divided into partial quantities and that these are to be produced at regular intervals that overlap each other.

This lot-sizing procedure is very useful if the actual requirement quantities that occur in the period or the quantity to be produced for a certain date are very large but production is only laid out for smaller quantities.

Integration

⚠️

>   Splitting and overlapping are only possible for fixed lot sizes and period lot sizes.

Prerequisites

- In Customizing for MRP, you must determine in the IMG activity *Check lot-sizing procedure* whether the procurement proposals are to overlap in the future or in the past starting from the requirements date:

Fixed Lot Size with Splitting and Overlapping

- You have maintained the following fields in the material master (*MRP 1* view):

    - *Lot size* field*: FS* indicator for *fixed lot size with splitting and overlapping*

    - *Fixed lot size* field*:* total order quantity

    - *Rounding value* field: Partial quantities, into which the total quantity is grouped. The fixed lot size must be a multiple of the rounding value.

    - *Takt time* field: The period of time that the procurement proposals are to overlap.

Period Lot Size with Splitting and Overlapping

- You have maintained the following fields in the material master (*MRP 1* view):

    - *Lot size* field*: FS* indicator for *period lot size with splitting and overlapping*

    - *Maximum lot size* field: Partial quantities, into which the total quantity is grouped.

    - *Takt time* field: The period of time that the procurement proposals are to overlap.

Features

The system generates procurement proposals for the rounding value until the fixed lot size quantity has been reached. The in-house production times overlap by the takt time.

Short-Term and Long-Term Lot Size

Use

If you define a short-term and a long-term lot size for a material, you can split up the time axis for the material requirements planning into a short-term and a long-term area and thus carry out the procurement quantity calculation using two different lot-sizing procedures.

You can therefore, for example, group together requirements over a larger period in the long-term area to produce a rough picture of the future master plan and select a more precise lot size to suit your requirements in the short-term area.

Prerequisites

You have defined the settings for the short-term and long-term lot size in the IMG activity *Check lot-sizing procedure* in Customizing for MRP.

Features

During the planning run the system calculates the time axis for the validity of both lot-sizing procedures. The procurement quantities in the first, short-term area are calculated using the short-term lot size. From the valid from date of the long-term lot size the system switches to the long-term lot size.

If no long-term lot size has been specified for a lot-sizing procedure, the system plans the complete planning period using the short-term lot size.

Calculating the Long-Term Lot Size

The start of the effectivity period of the long-term lot size is determined using the number of periods specified in Customizing. The system always rounds up to the end of a period that has already started and then sets the *valid from date* to the beginning of the next complete period. The system normally offers period lot sizes for the long-term lot size. This ensures, that the period requirements grouping is always traceable within the defined period length of the period lot size.

> The calculation of the date from which the long-term lot size is valid is 15 March. Four months have been entered for the periods for this calculation. The system calculates four months into the future (15 July) and then rounds up to the beginning of the next complete period. The long-term lot size is thus valid from 1 August.

> You can also define a **period for lot-for-lot order quantity** in Customizing, which is set for the short-term and the long-term period. The system then always plans using lot-for-lot order quantity in this period, even if other lot-sizing procedures have been defined in the short-term and long-term period.

Lot-for-Lot Remaining Order Quantity

Use

You can determine in the lot-sizing procedure that the last lot of the planning run is always planned exactly. You thus prevent that the procurement quantities exceed the requirement quantities and, for example, cause remaining stock levels of discontinued materials with high scrap costs.

Integration

This function can be used for all lot-sizing procedures. It is valid for the whole planning horizon.

⚠️

You cannot use the function in reorder point planning and time-phased planning.

Prerequisites

You have assigned a lot-sizing procedure, for which lot-for-lot remaining order quantity has been defined, to the material in the material master.

💡

You set the *Last lot exact* indicator in Customizing for MRP in the IMG activity *Check lot-sizing procedure,* in order to define lot-for-lot remaining order quantity.

Features

The last lot is planned exactly in the net or gross planning segment of the MRP list and the current stock/requirements list. The available quantity at the end of these segments is thus equal to zero.

Rounding

Use

In rounding, you adapt the procurement quantities to the delivery, packaging or shipment units. This is useful, for example, if deliveries can only be made in lots of 10 pieces or if the quantity produced can only be packed and transported in full pallets.

Integration

The system evaluates the set lot-sizing procedure first, then it allocates possible scrap and rounds the determined quantity.

Features

Two rounding options are available:

- Rounding value (quantities must be a multiple of this value)

- Rounding profile (staggered rounding values)

Rounding Profile

Use

You use a rounding profile if you want to round the procurement quantity up to quantities, which can be delivered or transported.

Prerequisites

You have assigned a rounding profile to the material in the *Rounding profile* field in the material master (*MRP 1* view).

> You define rounding profiles in Customizing for MRP in the IMG activity *Define rounding profiles*.

Features

A rounding profile consists of threshold and rounding values, whereby every threshold value is assigned a rounding value. If the requirement lies below the first threshold value, the system copies the original requirement value unchanged. If the requirement exceeds the first threshold value, the system always rounds up.

Example

A material's base unit of measure is 1 piece. The material is to be transported in layers (one layer corresponds to 5 pieces) or in pallets (one pallet corresponds to 8 layers which corresponds to 40 pieces).

You have defined the following rounding profile in Customizing:

$2 \rightarrow 5$
$32 \rightarrow 40$

From a requirement of 2 pieces, the system rounds up to 5 pieces, from a requirement of 32 pieces, it rounds up to 40 pieces.

The system then calculates the procurement quantities as follows:

Requirement	Procurement quantity
1	1
2	5
6	10
7	10
21	25
31	35
32	40
41	45
74	80

Rounding Profile

- For a requirement of 7 pieces, the system checks how many times 5 fits into 7. This results in a procurement quantity of 5 pieces (1x5 = 5). The system rounds up the remaining 2 pieces to 5 pieces. Thus, for a requirement of 7 pieces, one procurement proposal is created for 10 pieces.

- For a requirement of 74 pieces, the system checks how many times 40 in fits into 74. This results in a procurement quantity of 40 pieces (1x40 = 40). The system rounds up the remaining 34 pieces to 40 pieces. Thus, for a requirement of 74 pieces, a procurement proposal is created for 80 pieces.

Scheduling

Use

Scheduling is carried out in MRP after the system has calculated the quantity to be procured in the lot-size calculation. As the materials planned using consumption-based planing are externally procure, the following description is of **scheduling for external procurement**.

Scheduling determines the **order start and the order finish dates** of the procurement elements.

Prerequisites

- You must define the **processing time** for purchasing in workdays either in Customizing for MRP, in the plant parameters or in the workstep, external procurement.

- You must define the **planned delivery time** of the material in calendar days in the material master record (MRP 2 view).

- You must define the **goods receipt processing time** in workdays in the material master record (MRP 2 view).

Features

In forecast-based planning, the basic dates are calculated in **backward scheduling**, in reorder point planning, they are calculated in **forward scheduling**.

- This is the order start date and the order finish date of the planned order. The opening period is also taken into consideration in scheduling for the planned order.

- The following dates are calculated for the purchase requisition:

  – Delivery date (corresponds to the order finish date)

  – Release date (corresponds to the order start date)

Process Flow

Result

Backward Scheduling for External Procurement

Use

For materials that are planned **according to the MRP and forecast-based planning procedures**, the requirement dates in the future are known. The materials must be available by these dates. The release date for the purchasing department is calculated during scheduling, that is, the date by which the materials must be ordered so that they are available for the requirements date.

Process Flow

The system starts with the requirements date and then schedules backwards to determine the release date of the purchase requisition (order start date of planned order, which is to be procured externally).

2			1
Opening period	Processing time for purchasing	Planned delivery time	Goods receipt processing time

Opening date	Release date		MRP date
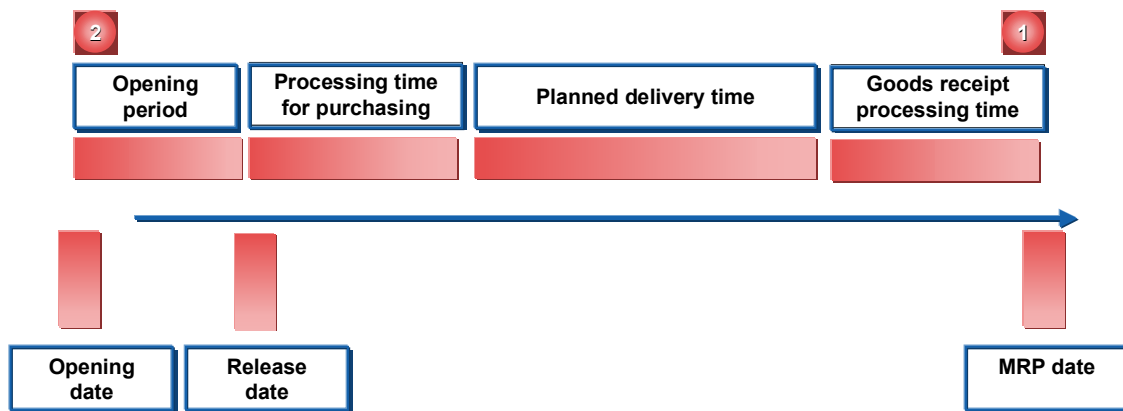
In MRP and forecast-based planning, the system always uses backward scheduling procedures to calculate the basic dates. Only if the start date that is calculated in backward scheduling happens to lie in the past, will the system automatically switch to **forward scheduling**.

> If you do not want the system to switch to forward scheduling automatically, you can specify per plant in Customizing for MRP, in the IMG activity *Parameters for determining the basic dates* that the system is to continue the backward scheduling calculation even if the resulting start date lies in the past.

Example of Backward Scheduling for External Procurement

Example Data

Requirements date	31.10. (Monday)
Planned delivery time of the material	10 days (calendar days)
Processing time for purchasing	1 day (workdays)
Goods receipt processing time	2 days (workdays)
Opening period	10 days (workdays)
Workdays = Monday to Friday	

Scheduling

1. Requirements data minus goods receipt processing time = order finish date (provision date for vendor)

   31.10. (Tuesday) minus 2 workdays = 27.10. (Friday)

2. Order finish date minus planned delivery time minus processing time for purchasing = release date for purchase requisition or order start date of planned order for external procurement.

   27.10. (Friday) minus 10 calendar days minus 1 workday = 16.10. (Monday)

3. Release date minus opening period for planned order = opening date of planned order

   16.10. (Monday) minus 10 workdays = 2.10. (Monday)

Forward Scheduling for External Procurement

Use

- For materials planned according to the **reorder point procedure**, the material shortage date is the date that the shortage was detected by the planning run. If the stock level should fall below the reorder level, then procurement must be arranged immediately.

- **Materials that are planned using MRP or forecast-based planning** are switched to forward scheduling if the start date calculated in backward scheduling was in the past.

Process Flow

The system determines the date by which the material will be available again, starting from the material shortage date.

> In forward scheduling, the opening date is of no significance as the ordering process is started immediately.
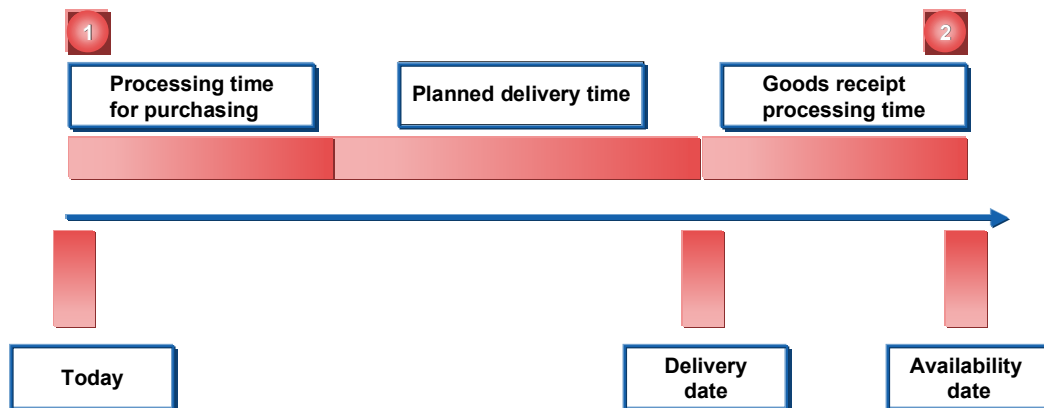
Example of Forward Scheduling for External Procurement

Example Data

Material shortage date	01.08 (Friday)
Planned delivery time of the material	10 days (calendar days)
Processing time for purchasing	1 day (workdays)
Goods receipt processing time	2 days (workdays)
Opening period	10 days (workdays)
Workdays = Monday to Friday, no bank holiday	

Scheduling

4. Material shortage date plus processing time for purchasing plan plus planned delivery time = delivery date

    01.08. (Friday) plus 1 workday + 10 calendar days = 14.08. (Thursday)

5. Delivery date plus goods receipt processing time = availability date

    14.08. (Thursday) plus 2 workdays = 18.08. (Monday)

Determining the Procurement Proposal

Implementation Options

Procurement proposals are used to procure the shortage quantity. Procurement proposals are internal planning elements that can be changed, rescheduled or deleted at any time: **purchase requisition** and **planned order**. In contrast, **delivery schedule lines** are fixed elements, which must be followed, and are only part of the procurement proposals in a broader sense.

Process Flow

- In the case of **in-house production**, the system always creates **planned orders**. These planned orders are used to plan production quantities. Once the MRP controller is satisfied with the results of planning, these planned orders are converted into production orders and passed on to production. Production orders are fixed elements, which must be followed.

- In the case of **external procurement**, the system creates either **planned orders** or directly creates **purchase requisitions**. Procurement proposals for external procurement plan the external procurement quantity. Once the MRP controller is satisfied with the results of planning, the planned orders are converted into purchase requisitions or the purchase requisitions are converted into purchase orders and are passed on to the purchasing department. Purchase orders are also fixed elements, which must be followed.

  > If you create a planned order in external procurement first, this has the advantage that the MRP controller has more control over the procurement proposals. Only once the MRP controller has checked the planned orders and converted them into purchase requisitions can the purchasing department order the material. Otherwise, the purchase requisition is immediately available to the purchasing department, which then takes over responsibility for material availability and warehouse stocks.

  - You use the creation indicator for purchase requisitions in the initial screen of the planning run to control whether the system is to create purchase requisitions immediately or whether it is to create planned orders first (see Creation Indicator [Page 141]).

  - If a **scheduling agreement** exists for a material and if an entry exists in the **source list** that is relevant to MRP, you can then also instruct the system to create **delivery schedules** in the planning run. To do this, you set the creation indicator for delivery schedules in the initial screen of the planning run (see Creation Indicator [Page 141]).

For more information, refer to *MM - Purchasing* under:

Scheduling Agreement [Ext.]

Source List [Ext.]

Procurement Type and Special Procurement Type

Use

When determining the procurement element, the system first finds out how procurement is to be carried out – either as in-house production or as external procurement. Materials planned using consumption-based planning are usually externally procured.

Prerequisites

- You must determine whether **in-house production, external procurement or both** is allowed for the material in the material master record (MRP 2 view). You set the procurement type using the **material type** in Customizing for the Material Master. You usually set *F for external procurement*.

- You must define more specifically how in-house production or external procurement is to be carried out by entering a **special procurement key** in the *Special procurement* field in the material master record (MRP 2 view).

Features

Procurement type

You usually enter the procurement type F for a material planned using consumption-based planning. If, however, in-house production and external procurement is to be allowed, you can also enter an X in the *procurement type* field in the material master record. You can then determine the procurement type as follows:

- By overwriting the indicator in the material master record.

- By converting the planned order into either a production order or into a purchase requisition.

- Using quota arrangements by defining quotas for external procurement and in-house production in the quota file (see Quota Arrangements [Page 95]).

If you want to leave the indicator X for both procurement types in the material master record and have not maintained any quota arrangements, the system automatically assumes that in-house production is to be used. Therefore, the planning run creates planned orders which you can then convert to either production orders or purchase requisitions.

Special procurement type

You use the **special procurement type** to define exactly how procurement is to be carried out. In consumption-based planning, you can only define the special procurement type **stock transfer from plant to plant** at plant level.

If you use storage location MRP [Page 107], you can also define the following special procurement types:

- External procurement

- Consignment

Procurement Type and Special Procurement Type

- Production in an alternative plant

- Stock transfer from an alternative plant

Quota Arrangements

Use

If a material can be obtained from **various sources of supply**, each individual source of supply can be allocated a **quota arrangement**. The quota arrangement is valid for a certain period of time and specifies exactly how the receipts are to be distributed amongst each source of supply.

You can set the quota arrangement for **in-house production** as well as for **external procurement**. Sources of supply can be:

- an individual vendor or outline agreement

- another plant, from which material should be procured

- a production version

Prerequisites

- You have maintained the **quota arrangement usage** for the respective material in the material master (*MRP 2* view).

    The quota arrangement usage determines whether a material is included in a quota arrangement and which operations lead to a quota arrangement. You can define, for example, that only purchase orders are included in quota arrangements or that procurement proposals created by the system in the planning run are also included.

    You define the quota arrangement usage in Customizing for Purchasing in the IMG activity *Define quota arrangement usage*.

- You have maintained the **quota file** for the material.

    You define the **sequence** of the sources of supply, the **quotas** per source of supply and numerous other parameters in the quota file.

Features

During the planning run, the system determines the sources of supply according to the quota file and assigns the procurement proposals to the sources of supply.

    In external procurement, the procurement proposal is allocated to the appropriate vendor. This vendor is copied to the purchase requisition.

For every procurement proposal with a quota arrangement, the system updates the **quota file**, so that the quota arrangement is always based on the current situation.

Two procedures are available:

- **Allocation quota arrangement**: every lot is assigned to a source of supply

- **Splitting quota arrangement**: a lot is split among various sources of supply

Further functions are also available for controlling quota arrangements. For example, you can set a maximum release order quantity that defines the maximum delivery capacity of one particular vendor.

Determining Source of Supply for External Procurement

Use

For purchase requisitions or delivery schedules, which are created during the planning run, the system can determine the source of supply directly from the planning procedure.

Features

Determining the Source of Supply via the Source List

The system first checks whether a quota arrangement has been maintained for the material, which has a validity period that covers the requirements date of the purchase requisition.

It then checks whether only one entry exists in the source list that is relevant to MRP. The indicator for source list usage must therefore be set for a particular vendor so that purchase requisitions and delivery schedules, which are created during the planning run, are automatically assigned to this vendor. In the case of a delivery schedule, you must also have maintained a **scheduling agreement** for this entry.

If you have maintained all the entries correctly, the system creates a purchase requisition with the source of supply that is recorded in the source list.

Determining Source of Supply by Quota Arrangements and Source List

The system first checks to see whether a **quota arrangement**, which is valid for the delivery date of the purchase requisition, has been maintained in the quota file for the material. It also checks to see whether the indicator for quota arrangement usage has been correctly maintained in the material master. The system then calculates from which vendor the material should be procured, using the quotas specified for the vendors.

As the next step, the system checks whether an entry for the vendor that is relevant to MRP exists in the **source list**. For this, the indicator for source list usage must be set correspondingly. If this is the case, then all further data required for the purchase requisition or the delivery schedule is copied from the source list.

> You can maintain the source list in the *Purchasing* task level menu by choosing, *Master data → Source list → Maintain*.

Source of Supply Determination Using the Manufacturer Part Number

In the procurement process, you can use your firm's own material number as well as the **manufacturer's material or part number**.

You can also create purchasing info records for this material number. However, you create the source list and, if required, the quota arrangement for your firm's own material number. When determining the source of supply, the system finds the appropriate info record for the manufacturer's part number.

See also:

For more information, refer to *MM - Purchasing* under:

Scheduling Agreement [Ext.]

Determining Source of Supply for External Procurement

Source List [Ext.]

Manufacturer Part Number (MPN) [Ext.]

Manufacturer Part Number: Functions [Ext.]

Shipping Notification

Use

In Purchasing, you can maintain **confirmations** for purchase orders or scheduling agreements. The confirmations include, among other things, order acknowledgments, loading and transport confirmation and the actual shipping notification. These confirmations can serve purely for information purposes or the dates and quantities can be taken into account in material requirements planning.

> All of these confirmations are collectively referred to as **shipping notification** in material requirements planning. The term shipping notification will therefore always be used in the following information.

Working with shipping notifications provides the planning department with a more exact planning procedure as more reliable information about the delivery to be received is available from the vendor between the order date and the desired delivery date.

Prerequisites

In Customizing for Purchasing in the IMG activity *Set up confirmation control*, you have defined the confirmation control key and determined whether the individual confirmations in the material requirements planning should be taken into account or not.

Features

Shipping Notification in the MRP List or Stock/Requirements List

In the MRP list or in the stock/requirements list, you can see which purchase order quantities have been either partially or completely reduced by more current shipping notification. The delivery quantity of the corresponding purchase order is reduced in the net requirements calculation by the notified quantity. If the total order quantity has been confirmed, only the shipping notification is displayed in the MRP list or in the stock/requirements list.

> The shipping notification (MRP element, ShpgNt) has the same number as the corresponding purchase order.

Shipping Notification in Availability Check According to ATP Logic

In the availability check, the shipping notification is considered as an available quantity, if the shipping notification was added to the scope of the check of the checking rule.

You must distinguish between the following cases:

- If you only select the purchase order when determining the scope of the check, shipping notifications are automatically taken into account.

- If you only select the shipping notification, only notified quantities are taken into account in the availability check, whereas the purchase orders are not.

Shipping Notification

Activities

You can thus check the shipping notifications in the material requirements planning:

1. In the stock/requirements list: Position the cursor on the purchase order and choose 🖊 or ♻.

    The item screen of the selected purchase order appears.

2. Choose *Item → Confirmations → Overview*.

    The overview screen for the confirmations now appears.

Creation of Exception Messages

Use

Exception messages depend on the transaction being carried out and are meant to **inform** you of an **important or critical event** (for example, start date lies in the past, safety stock has been exceeded).

By means of the exception messages, you can easily sort out any materials that you need to **reprocess manually**. Special search and selection functions are available for this in the evaluations for MRP.

Process Flow

During the planning run, the system recognizes exceptional situations where you usually have to manually reprocess the planning result and it records these situations as exception messages. The system displays the exception messages in the **evaluations for MRP**.

Exception messages refer to an individual MRP element. If several exception messages occur for one MRP element, the most important ones are stored.

Rescheduling Check

Use

An important group of the exception messages mentioned above are the **rescheduling proposals**. In the net requirements calculation, the system checks whether warehouse stock or firmed receipts are available in sufficient quantity to cover requirements. If a material shortage exists, the system usually creates a new procurement proposal. The rescheduling check is used to change the dates of already existing **firmed receipts** not planned on the same day as the requirement to suit the requirement date. For this purpose, the system displays the appropriate exception messages with rescheduling proposals for these firmed receipts to be processed by the MRP controller.

Prerequisites

You have defined the rescheduling parameters in Customizing for MRP:

- per plant in the IMG activity *Carry out overall maintenance of plant parameters*

- per MRP group in the IMG activity *Carry out overall maintenance of MRP groups.*

The **rescheduling horizon**, which defines the period for bringing forward the receipts, and the **receipt elements**, which should be taken into account in rescheduling, are included in these.

> You can also define tolerance values for the creation of exception messages, in Customizing. These values define a time period in which no exception message is to be created, despite the fact that a rescheduling proposal may exist. The MRP controller can thus avoid a situation where too many exception messages are created if a certain buffer has already been planned for scheduling basis dates.

Process Flow

- *Bring process forward (reschedule in)*

  Within this rescheduling horizon, the net requirements calculation checks whether, after a requirement, a firmed receipt exists, which can be used to cover this requirement. Then the system displays a **rescheduling date** as well as the exception message *Bring process forward* for this receipt. The net requirements calculation then uses this receipt and the system will only create another procurement proposal if the receipt quantity is not sufficient to cover the complete requirement. Several firmed receipts can be used to cover one requirement.

  > The rescheduling horizon is always calculated from the MRP date.

- Postpone process (reschedule out), or cancel process

  The net requirements calculation checks over the complete time axis whether availability could still be guaranteed without the receipt in question. If this is the case, the system checks whether the receipt planned here could be used to cover a future requirement. If the system can find such a requirement, it then displays a **rescheduling date** as well as the exception message *Postpone process* for this receipt.

If the system finds no future requirement, for which the receipt is required, the system displays the exception message *Cancel process*.

Stock Transfer from Plant to Plant

Implementation Options

Within the stock transfer procedure, goods are produced and delivered **within a company**. The plant that is to receive the goods (**receiving plant**) orders the goods internally from another plant that is in a position to deliver the goods (**issuing plant**). The dependent requirements for the components to be transferred are determined in the receiving plant.

You use the stock transfer procedure, if two plants are located far away from each other, as the transport of materials to be transferred is taken into account in MRP with this type of procedure.

> You can also transfer the stock manually using stock transport requisitions, orders and delivery schedules. You can find further information in the SAP document *Managing Special Stocks and Special Forms of Procurement* in Materials Management under Stock Transfer Using Stock Transport Orders [Ext.].

> In addition to stock transfer from plant to plant there is stock transfer from plant to MRP area, which you can use, for example, in subcontracting. You can find further information under Stock Transfer from Plant to MRP Area [Page 135].

Prerequisites

- You have maintained a special procurement key for *stock transfer* in Customizing for MRP, in the IMG activity *Define special procurement type* and you have entered the delivering plant there.

- You have assigned this special procurement key to the material in the material master of the receiving plant (*MRP 2* view).

- You have created a material master for the material in the issuing plant.

Process Flow

The following example demonstrates the stock transfer procedure in MRP:

Initial situation:	Plant 0001		Werk 0002
	Available quantity		Available quantity
Warehouse stock 0	0	Warehouse stock 500	500
Requirement -100	-100		
Stock transport 100 requisition for plant 0002	0	Release -100	400

Conversion of requisition into order			
~~Requisition~~ Order 100	0	~~Release order~~ Reservation -100	400
		Good issue in stock in transit	
Goods receipt for order	100 Transport	~~Reservation~~ Stock transfer -100	400
Warehouse stock 100		Warehouse stock 400	400

A material in plant 0001 has the special procurement key *Stock transfer* with issuing plant 0002. This defines that the material is to be procured from plant 0002.

1. First you plan material requirements in the receiving plant 0001 and then in the issuing plant 0002.

2. On detecting a shortage in plant 0001, the system automatically creates a planned order for stock transfer or a stock transport requisition in plant 0001 and a release order for the planned order or purchase requisition in plant 0002.

   The date of the release order in plant 0002 is determined during scheduling.

3. In plant 0001, you convert the stock transport requisition into a stock transport order. When doing this, the release order in plant 0002 is automatically converted into a purchase order.

   If the planning run in plant 0001 has firstly created a planned order for stock transfer, you must convert this into a purchase requisition and then convert this into a purchase order.

4. The material is procured and managed as stock in the issuing plant.

5. When transferring stock, the following postings are necessary:

   The removal from storage of the ordered quantity in plant 0002 is carried out by a transfer posting with reference to the purchase order.

   The movement type in this case is *Transfer posting → Plant to plant → To stock in transit*. Stock in transit is the quantity of a material which was withdrawn from the warehouse of the issuing plant but which has not yet been received by the receiving plant.

   In the receiving plant, you post a goods receipt for the stock transfer order on receipt of the goods. The stock in transit is then placed in the warehouse of plant 0001.

Planned Orders for Stock Transfer

Use

With the special procurement type *Stock transfer*, it can be useful to create **planned orders for stock transfer** at an earlier planning stage rather than stock transport requisitions.

Prerequisites

You have entered the indicator *3* for *planned orders* as the creation indicator for purchase requisitions (*Create purchase requisition* field) in the initial screen of the planning run.

Features

In this case, the planning run creates planned orders for stock transfer instead of stock transport requisitions.

Planned orders for stock transfer can be converted into stock transport requisitions or into schedule lines.

The document type of planned orders for stock transfer is NB in the standard system and can be changed, for example, to UB, during a conversion.

In the case of cross-company code stock transfers, the document type NB must be used in the standard system.

Storage Location MRP

Use

Material requirements planning is usually carried out at plant level. This means that the system adds together stocks from all of the individual storage locations, with the exception of individual customer stock, to determine total plant stock. It may be necessary to exclude storage location stock from the plant's MRP run, or you may want to plan certain stocks separately.

- A warehouse is geographically too far away from the production location that is planned with the storage location MRP.

- The stock of a storage location is only available for service and not for production.

Integration

If you plan several storage locations together or also want to plan storage locations using MRP, you can plan with .

Features

The following options are available:

- The storage location is to be **planned separately**. Fundamentally, separate storage location MRP is carried out using **consumption-based planning**. In this case, you must also define a **reorder level** and a **replenishment quantity** (fixed lot size) at storage location level. In so doing, it is possible to monitor this storage location's stock automatically, and if the stock level should fall below the reorder level the storage location is also replenished automatically.

  In the planning run, stock that lies in this storage location, and which is planned separately, is not contained in the available stock at plant level.

  If a receipt element (planned order, purchase requisition, purchase order, production order, and so on) or an issue element (reservation, sales order) refers to either a storage location that is excluded from the planning run or one that is planned separately these elements are not taken into account at plant level.

  Reservations and sales orders, which are planned in a storage location for which MRP is carried out separately, are not included when calculating plant stock. The net requirements calculation for these requirements is restricted to this storage location.

- The storage location is **excluded from the planning run**. In this case, the storage location's stock is not contained in the available stock at plant level, nor is it included in the planning run. The exclusion of storage location stock is only relevant to the planning run. You can, however, still make withdrawals from this stock.

Planning Storage Location Stock Separately

Use

You can plan storage locations separately, that is, storage location stock separately from plant stock.

Prerequisites

You have maintained the following entries for the storage location (*Storage location MRP* screen area) in the material master (*MRP 4* view):

- You have set the *Storage location stock planned separately* indicator as the *MRP indicator.*

- You have defined a reorder level and a replenishment quantity (fixed lot size).

- You must also decide which type of procurement is to be used for this storage location:

  - stock transfer from storage location to storage location in a plant

  - stock transfer from another plant

  - external procurement directly to the storage location

  - in-house production directly to the storage location

  - production in an alternative plant

  - procurement on a consignment basis

    For procurement from storage location to storage location of a plant, you only have to enter the MRP indicator, the reorder level and the replenishment level.

    All other procurement types are defined using the field, *Special procurement type, storage location*.

    No special procurement keys are included in the standard system for procurement types *External procurement directly to storage location* and *Internal procurement directly to storage location*. Create these procurement types in Customizing for MRP. For more information refer to the *Define special procurement types* chapter in the Implementation Guide.

Features

During a planning run, the system compares the reorder level of storage locations to be planned separately with the stock of this storage location. If available storage location stock falls below the reorder level, a **receipt element** is created **amounting to the replenishment quantity** or, if necessary, for a multiple of the replenishment quantity.

According to the procurement type selected for the storage location, the receipt can take the form of a purchase requisition, a planned order, a schedule line and so on and directly refers to this storage location.

The system takes **quota arrangements and the source list** into account when creating a purchase requisition or a schedule line.

The source list can refer to a contract or a delivery schedule.

- If the source list refers to a delivery schedule, the system will only take the delivery schedule if the storage location recorded in it is the same storage location for which storage location MRP was defined in the material master record.

- If the source list refers to a contract, the system will only take the contract if the storage location recorded in it is the same as the one for which storage location MRP was defined in the material master record.

If you have chosen *Stock transfer within a plant* as procurement type for the storage location, the system creates a stock transfer reservation. This is regarded as a receipt at storage location level and as an issue at plant level.

The following diagram illustrates the procedure for stock transfer within a plant:
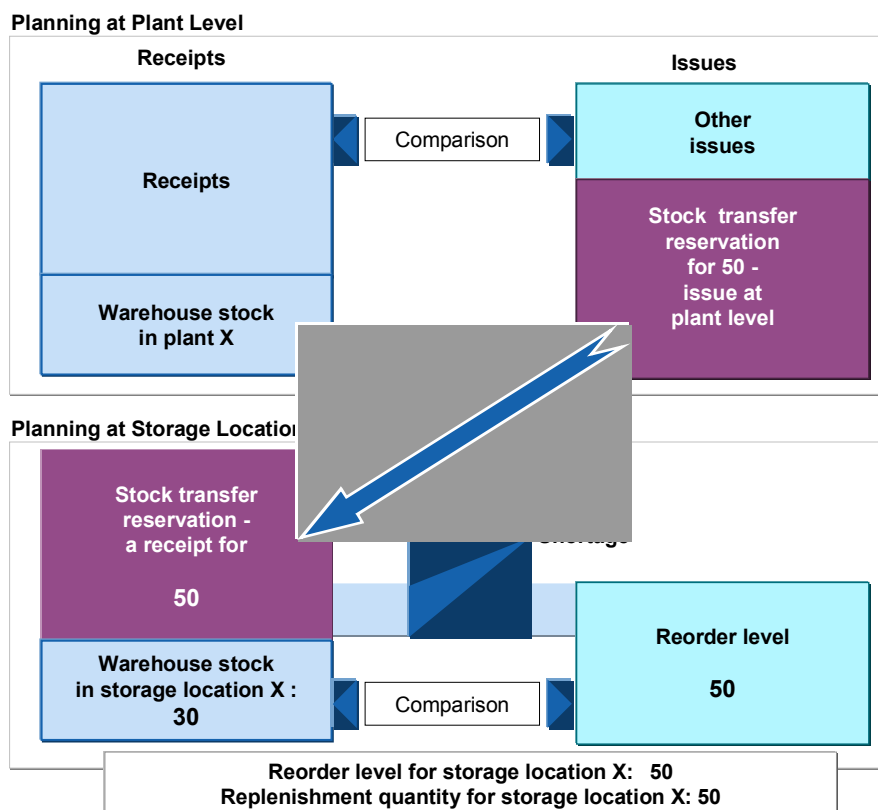
For storage location X, the reorder level was set to 50 pieces. Since stock at the storage location X (30) has fallen below the reorder level, a stock transfer reservation amounting to the fixed lot size (50) was created. At the same time, this stock transfer reservation produced an issue at plant level for the same amount.

See also:

Reorder Point Planning [Page 14]

Excluding a Storage Location from MRP

Use

You can exclude a storage location from MRP at plant level.

Prerequisites

You have set the *MRP indicator* for *Storage location stock excluded from MRP* for the storage location (*Storage location MRP* screen area) in the material master (*MRP 4* view).

Features

- The available warehouse stock at plant level is reduced by the stock in the storage locations that are to be planned separately. You can, however, still make withdrawals from this stock.

- **No net requirements calculation** is carried out for these storage locations to be planned separately.

MRP Area

Definition

The MRP area represents an organizational unit **for which material requirements planning is carried out independently**.

Basically, there are three types of MRP area:

- **Plant MRP Area**

    The plant MRP area initially contains the plant together with all its storage locations and stock with subcontractors.

    When you have defined MRP areas for storage locations and for subcontractors and you have assigned the materials, the plant MRP area is reduced by exactly this number of subcontractors and storage locations. This is because they are now to be planned separately.

- **MRP Areas for Storage Locations**

    You can define an MRP area that consists of a particular storage location, by creating an MRP area and assigning the storage location to it. Material requirements for this storage location are then planned separately from the rest of the plant.

    You can also group several storage locations into one MRP area, by creating an MRP area and assigning the storage locations to it. These storage locations are then planned together.

    ⚠️

    A storage location of a plant may be assigned to only one MRP area.
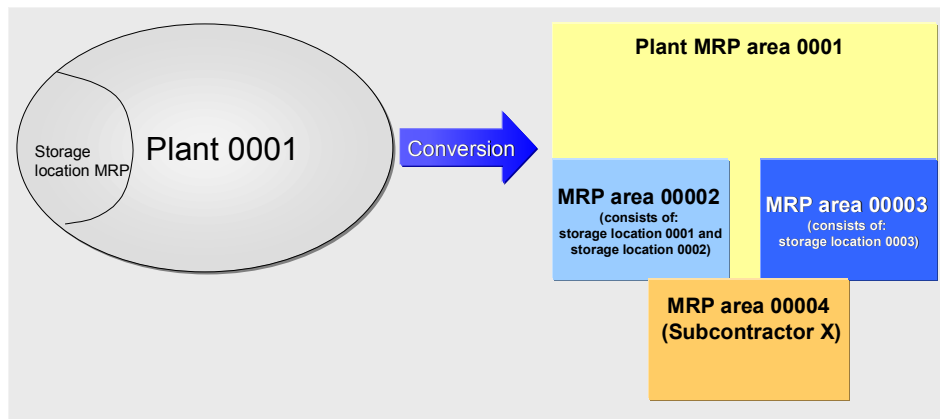
- **MRP Areas for Subcontractors**

    You can also define an MRP area for each subcontractor.

    ⚠️

    A subcontractor may be assigned to only one MRP area. An MRP area of the subcontractor type may also only contain one subcontractor.

The following graphic shows an example of how a plant can be divided after the implementation of MRP areas:

MRP Area

Use

- You can carry out MRP specifically for the determined MRP areas. This enables you to carry out **differentiated material requirements planning**. The requester can be, for example, the production on a particular assembly line or a subcontract order.

- The MRP area allows you to have specific control over the staging and procurement of important parts produced in-house and purchased parts for each **shop floor area**. You can, however, also plan the provision of components for the individual **subcontractors**.

- MRP areas of the **storage location or subcontractor type** are only suitable for:

  – components that are planned and produced **for stock**

  – finished products that are planned and produced **for stock.** By assigning a storage location in a sales order or by entering an MRP area when creating the planned independent requirements, you can define whether a material is planned in the plant MRP area or in the MRP area of the storage location.

- Finished products and important assemblies intended for **make-to-order or engineer-to-order production** are always planned in the **plant MRP area**.

- The planning run takes into account the planning with MRP areas as follows:

  – If you do not enter a separate scope of planning, the system plans the whole plant, that is, all MRP areas in the plant, during the **total planning run**. If you want to carry out a total planning run for a particular MRP area only, you must specify the required MRP area in the scope of planning.

  – During **single-item, multi-level planning**, the system plans the selected material in the MRP area entered. In addition, the system takes into account planning file entries from other MRP areas, for example, if the material is to be procured using stock transfer.

  – During **single-item, single-level planning**, the system plans the selected material in the MRP area entered only.

Structure

- You define the **MRP areas** in Customizing for MRP. You can thereby assign the following to an MRP area:

  – **one or more storage locations** (example: you want to carry out planning for a particular assembly line and therefore assign a production storage location to the MRP area)

- **a subcontractor.**

- You assign the various MRP areas to the materials in the **material master**. For this, you create an **MRP area segment** for a material for every MRP area, in which it is used. In this MRP area segment, you can define MRP parameters such as, for example, the lot size or MRP type. This allows you to plan the material differently in the MRP area from how you plan it in the plant MRP area.

    MRP with MRP areas for the material is not activated until the material has been assigned to an MRP area. If you have not assigned a material to an MRP area, that is, you have not created an MRP area segment in the material master, the material will continue to be planned in the plant MRP area only. If you have assigned an MRP area to it, the system can plan it in the plant MRP area and in the assigned MRP area.

Integration

- You can carry out material requirements planning for MRP areas using all MRP procedures and all lot-sizing procedures.

- You can also carry out an independent material forecast for MRP areas using your own parameters.

- The material consumption values are updated separately for each MRP area.

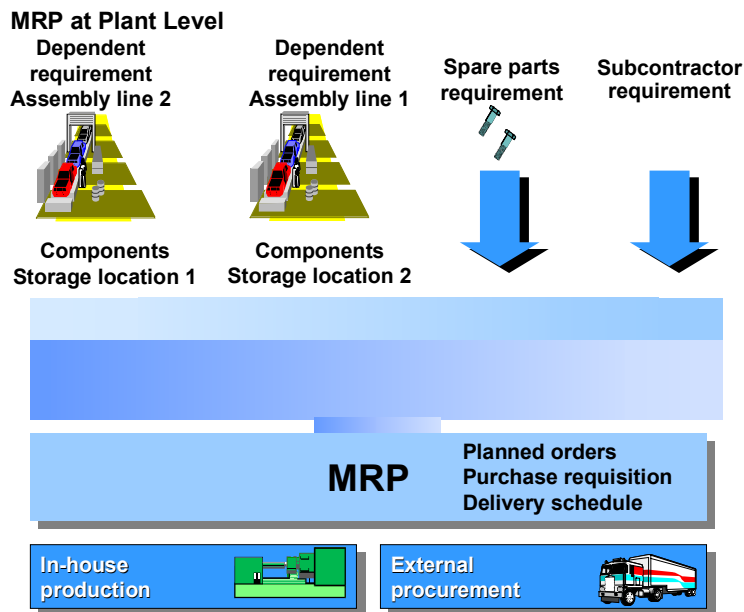- A separate ATP check is carried out for each MRP area.

    If several storage locations belong to an MRP area, the system can also carry out a check at two levels, that is, at storage location level and at MRP area level.

Examples for Planning with MRP Areas

MRP at Plant Level

During MRP at **plant level**, the various requirements are combined in the planning run and procurement elements are created for these pegged requirements with unknown sources.
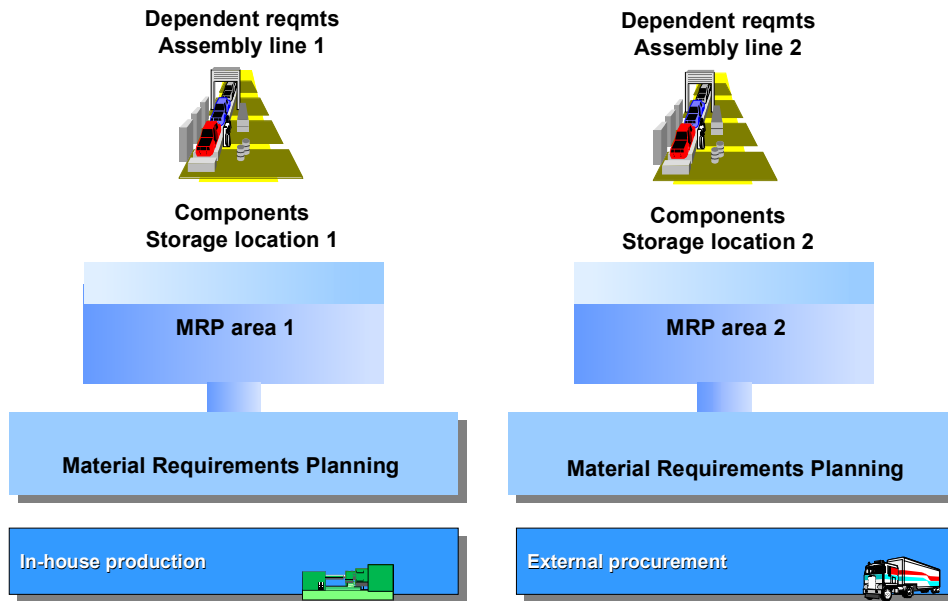
MRP at Plant Level

Dependent requirement Assembly line 2	Dependent requirement Assembly line 1	Spare parts requirement	Subcontractor requirement

Components Storage location 1	Components Storage location 2

MRP   Planned orders
Purchase requisition
Delivery schedule

In-house production   External procurement

MRP for MRP Areas

Example: Assembly Area

Material requirements planning for each MRP area allows you to have specific control over the staging and procurement of parts produced in-house and purchased parts **for each shop floor and assembly area**. If, for example, you define an MRP area for the production storage location of an assembly line, the system plans the material requirements for the assembly line separately from all other requirements (see Planning Components for a Production Line [Ext.]).
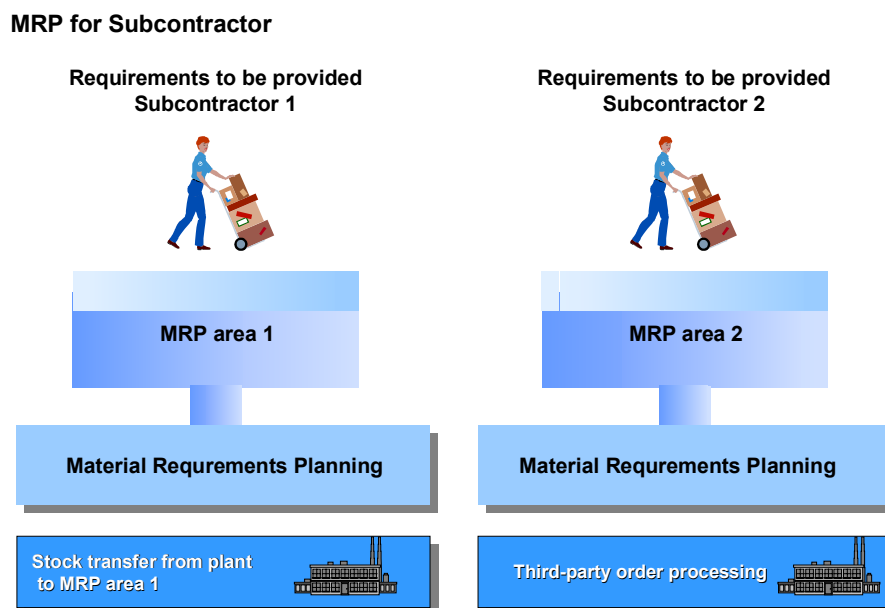
MRP for Assembly Area

| **Dependent reqmts** | **Dependent reqmts** |
| **Assembly line 1** | **Assembly line 2** |

| **Components** | **Components** |
| **Storage location 1** | **Storage location 2** |

| **MRP area 1** | **MRP area 2** |

| **Material Requirements Planning** | **Material Requirements Planning** |

| **In-house production** | **External procurement** |

Example: Subcontractor

You can also carry out planning for components to be provided in subcontracting using an MRP area by defining an MRP area for every subcontractor and assigning the components to be provided to the MRP area of the subcontractor. You therefore plan the **requirements to be provided** for these components for one subcontractor **separately from all other requirements** (see Planning for Components to be Provided in Subcontracting [Ext.]).

In the following graphic, each subcontractor corresponds to an MRP area.

MRP for Subcontractor

| **Requirements to be provided** | **Requirements to be provided** |
| **Subcontractor 1** | **Subcontractor 2** |

| **MRP area 1** | **MRP area 2** |

| **Material Requrements Planning** | **Material Requrements Planning** |

| **Stock transfer from plant to MRP area 1** | **Third-party order processing** |

Examples for Planning with MRP Areas

Depending on the requirements situation, the system creates either stock transfer reservations from the plant to the stock of material provided of the subcontractor or it creates purchase requisitions within subcontracting/third-party order processing, according to the special procurement key settings.

Stock Transfer Procedure
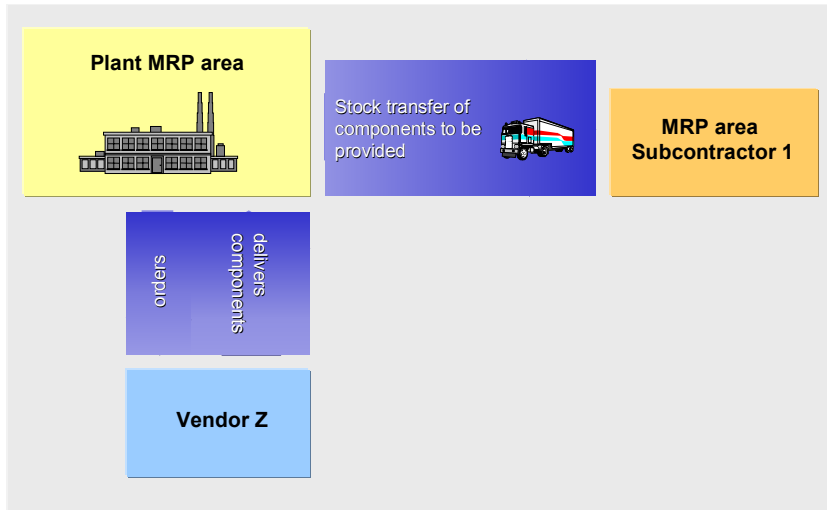
Procedure for Third-Party Order Processing in Subcontracting
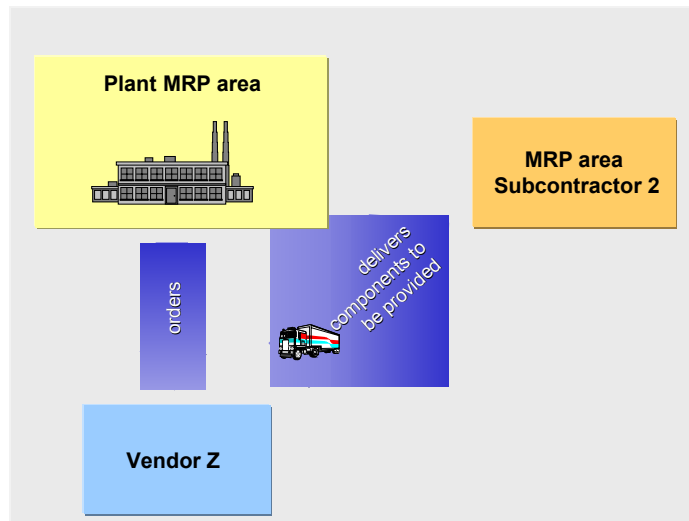
Implementing MRP Areas

Implementation Options

The main reason for you to implement MRP areas is if you would like to plan materials, which are required in different shop floor areas, storage locations or by subcontractors, separately from one another.

As soon as you have activated materials requirements planning with MRP areas, this type of MRP is **active at client level**, that is, MRP will be carried out in this way in all plants.

⚠

Material requirements planning with MRP areas **cannot be reversed**.

Process Flow

You can implement material requirements planning with MRP areas in three steps:

1. You convert the existing planning file entries at plant level to **planning file entries at MRP area level**.

   During the conversion, the system creates a plant MRP area for every plant as a background job. This, however, will not affect your planning. The processes in material requirements planning and the planning results remain unaffected.

   💡

   The conversion is also useful even if you do not work with MRP areas, but still have to plan for several plants, as the new planning file improves system performance during the planning run.

2. You activate **MRP with MRP areas** in Customizing for MRP. This causes the *MRP area* field to appear in the applications of MRP and in related areas. When you enter the plant number, the system automatically fills the field with the number of the plant MRP area. The number of the plant MRP area is the same as the plant number.

   This does not affect the planning run as the plant MRP area still corresponds to the present plant.

3. You **define an MRP area**, for example, for a storage location. You then assign the materials that are to be planned for this storage location, by **creating an MRP area segment** in the material master.

   Materials requirement planning for this storage location is then carried out separately. The storage location stock is no longer included in the available stock of the plant MRP area. The receipt and issue elements of this storage location (MRP area) are also not taken into account in the plant MRP area. They are only taken into account in the MRP area of the storage location.

   ⚠

   If you have already worked with storage location MRP [Page 107] the system still carries out storage location MRP even after the activation of MRP areas. You need to decide in principle whether you want to continue using storage location MRP or whether you want to create MRP areas for the storage locations that are planned

Implementing MRP Areas

separately. It is not possible to simultaneously plan a material using storage location MRP and an MRP area for the same storage location.

If you decide to use MRP areas, you should then try to convert all storage locations that are planned separately to MRP areas in one step. Before you assign the material to an MRP area, you must remove the MRP indicator, which is located in the material master at the storage location organizational level (view *MRP 4*) in the screen area *Storage location MRP*.

Even if you have defined MRP areas in Customizing, the system plans the materials in the plant MRP area until you assign the MRP areas to the materials.

Only the assignment of one or more MRP areas to a material, by creating MRP area segments in the material master, actually cause changes in the material requirements planning.

Preparing for Material Requirements Planning with MRP Areas

Implementation Options

This process describes which master data you must maintain in order to be able to carry out material requirements planning at MRP area level.

Process Flow

1. **Convert Planning File Entries** (Customizing)

   You convert the existing planning file entries at plant level to planning file entries at MRP area level. To convert the planning file entries, you use the report that you trigger in Customizing for MRP in the IMG activity *Convert planning file entries for MRP areas.*

   The system creates a new planning file and MRP areas for the existing plants. These MRP areas, however, do not affect how material requirements are planned. The number of the plant MRP area is identical to the plant number and therefore has four digits.

   ⚠️

   You cannot create plant MRP areas manually. The plant MRP areas are only created automatically by the conversion report (see Converting the Planning File Entries [Page 122]).

2. **Activate MRP** (Customizing)

   In the IMG activity *Activate MRP for MRP areas,* set the *MRP area active* indicator. This activates material requirements planning with MRP areas at client level. The *MRP area* field appears for selection in the MRP applications.

   ⚠️

   Material requirements planning with MRP areas **cannot be reversed**.

3. **Create MRP Areas** (Customizing)

   In the IMG activity *Define MRP areas*, you create the MRP areas for every plant, for which you would like to carry out material requirements planning separately.

   When creating an MRP area, enter:

   − Number of the MRP area. The number must have at least five digits, so that there is no overlapping with the plant MRP area.

   − Description of the MRP area.

   − MRP area type

   − Receiving storage location (must belong to the MRP area)

   Finally, you assign the storage locations or the subcontractors to the MRP areas.

   There are three different types of MRP area:

   − **Type 01 for Plant**

Preparing for Material Requirements Planning with MRP Areas

The plant MRP area initially contains the plant together with all its storage locations and stock with subcontractors. The plant MRP area is created automatically when you convert the existing planning file entries to planning file entries for MRP areas.

When you have defined MRP areas for storage locations and for subcontractors and you have assigned the materials, the plant MRP area is reduced by exactly this number of subcontractors and storage locations, as they are now to be planned separately.

- **Type 02 for Storage Locations**

   You choose this type for MRP areas that consist of one or more storage locations. A storage location can only be assigned to one MRP area.

- **Type 03 for Subcontractors**

   You choose this type if you would like to define an MRP area for a subcontractor. You can only assign one subcontractor to an MRP area of the type subcontractor. You cannot assign the same subcontractor to another MRP area.

4. **Assign MRP Areas to Materials**

   You assign the MRP areas to the materials by creating an MRP area segment for each MRP area in the material master. You can assign several MRP areas to one material (see MRP Area Segments in the Material Master [Page 125]).

   MRP with MRP areas for the material is not activated until an MRP area has been assigned to a material. If you have not assigned an MRP area to a material, that is, you have not created an MRP area segment in the material master, the material will continue to be planned in the plant MRP area only. If you have assigned an MRP area to the material, the system can plan it in the plant MRP area and in the assigned MRP area.

   You can display an **overview for all materials in an MRP area**. To do this, you go into Customizing for MRP and choose the IMG activity *Define MRP areas*. Call up an MRP area by double-clicking and choose *Material overview for MRP area.*

5. **Check Storage Locations**

If you have already entered a storage location in the BOM (BOM item), in the work center (supply area) or in the production version, you should check whether this storage location is the storage location for the MRP area that you have assigned in the material master.

⚠

The materials are assigned to an MRP area via the storage location that the system determines during the planning run. You should therefore check the storage locations that you have maintained in the material master. The storage location in the material master must be a storage location for the MRP area, for which you have created an MRP area segment in the material master. You can therefore ensure that material requirements planning will be carried out for the correct MRP area (see Determining and Assigning Storage Locations to the MRP Area [Page 132]).

Converting the Planning File Entries

Use

You must **convert the existing planning file** (table MDVM) to the new planning file (table DBVM) in order to be able to use MRP areas in materials requirements planning.

> The conversion is also useful even if you do not work with MRP areas, but still have to plan for several plants, as the new planning file improves system performance during the planning run.

Features

The planning file entries are converted using a report which you can start in Customizing for MRP in the IMG activity *Convert planning file entries for MRP areas*. The following functions are carried out with the report:

- During the conversion, the system creates a plant MRP area for every plant.

- The existing planning file entries are copied from the planning file used up to now into the new planning file.

- The system deletes the planning file that had been used up to now after the conversion has taken place.

- At client level, the indicator *Planning file entries for MRP area converted* is set in a system table. This indicator causes material requirements planning to be carried out using planning file entries at MRP area level from this point onwards.

> The report also converts the individual customer planning file entries at plant level to individual customer planning file entries at MRP area level.

Activities

Start the conversion report.

Planning File Entries for MRP Areas

Use

In order for material requirements planning to be carried out for an MRP area material, an **entry** must exist for the material in the **planning file**. If changes are relevant to MRP, the system must set a planning file entry.

Prerequisites

You have converted the planning file entries at plant level to planning file entries at MRP area level.

Features

Creating/ Changing / Deleting Records in the Planning File

- If you assign a material to a **new MRP area** in the material master record, a new record is written in the planning file for this assignment.

- If you change **settings** in the MRP area for a material that are **relevant to MRP**, for example, the MRP type, lot-sizing procedure and so on, the corresponding record in the planning file is changed, that is, the system sets a planning file entry for the MRP area material.

Setting a Planning File Entry

If you change MRP elements, the system checks the *Plant, Storage location* and *Vendor* (subcontractor) fields and determines the MRP area affected according to the MRP area assignment in the material master and the settings in Customizing. The system then sets a planning file entry for the material at MRP area level in the planning file.

During this process, the system decides whether the planning file entry has to be set **for just one MRP area** or **for all MRP areas**.

- If you change a purchase requisition, the system determines the MRP area affected and sets the planning file entry for just the MRP area affected for the material.

- If you change the BOM of a material, the system sets the planning file entries for all MRP areas of the material, as a change in the BOM has an effect on all MRP areas that are assigned to the material.

Activities

- Displaying planning file entries for MRP areas

    Starting from the MRP menu, choose *Planning → Planning file entry → Display* and enter the MRP area.

- Creating a planning file entry manually

    In general, the system automatically sets the planning file entries. In exceptional cases, however, it may be useful to create a planning file entry manually.

Planning File Entries for MRP Areas

Starting from the MRP menu, choose *Planning* → *Planning file entry* → *Create* and enter the material number and MRP area.

MRP Area Segments in the Material Master

Use

In order to be able to assign a material to an MRP area, you have to **create the MRP area segment for this MRP area** in the material master.

> MRP with MRP areas for the material is not activated until an MRP area has been assigned to a material. If you have not assigned an MRP area to a material, that is, you have not created an MRP area segment in the material master, the material will continue to be planned in the plant MRP area only. If you have assigned an MRP area to the material, the system can plan it in the plant MRP area and in the assigned MRP area.

Prerequisites

You have defined the MRP areas in Customizing for MRP.

Features

- You can assign a material to one or more MRP areas by creating a segment for each MRP area.

- In the following screens, for each MRP area, you can enter individual **MRP and forecast parameters** that are different from those defined in the material master at plant level:

  - **MRP 1**

    Here, you can enter an MRP group and define the data required for the MRP procedure and lot-size calculation.

  - **MRP 2**

    Here, you can define procurement data, that is, the special procurement key and the storage location in which the goods are to be received, in addition to an individual planning calendar and, if necessary, data for the net requirements calculation.

  - **Forecast**

    Here, you can enter the Forecast Parameters [Page 233] if you want to forecast for the material in this MRP area. This is also possible if you do not forecast at plant level.

  - **Consumption values**

    Here, you can enter historical Consumption Values [Page 251] for a material in an MRP area if you use forecast-based planning for the MRP area.

- You can delete the assignment of a material to an MRP area in the material master as long as no postings exist in that MRP area for the material. To do this, place the cursor on the MRP area in the *Overview: MRP areas* dialog box and choose *Delete*.

MRP Area Segments in the Material Master

Activities

You can copy the MRP data of a plant segment or the MRP data of an existing MRP area segment when you create an MRP area segment for a material. To create by copying, proceed as follows:

1. In the material master (view *MRP 1*, screen area *MRP areas*), choose the function key *MRP areas.*

> The *Overview: Display MRP areas* dialog box appears.

2. Choose 🔲.

> The *Copy with reference* dialog box appears.

3. Choose whether you wish to use the plant-level MRP data or the MRP data of an existing MRP area segment. If necessary, enter the number of the MRP area, from which you want to copy the MRP data.

4. Enter the MRP area, for which you wish to create the MRP area segment, in the *Destination MRP area* field and choose ✔ *Copy*.

> The new MRP area segment is created and displayed in the overview list.

5. Select the MRP area and choose 🖉.

6. Check the MRP and forecast parameters that were copied and carry out any necessary changes.

7. Choose *Adopt*.

> The *Overview: MRP areas* screen appears.

8. Choose *Continue* again and save the material master.

> 💡
>
> You can display an **overview for all materials in an MRP area**. To do this, you go into Customizing for MRP and choose the IMG activity *Define MRP areas*. Call up an MRP area by double-clicking and choose 👤 *Material overview for MRP area.*
>
> 💡
>
> The system logs changes to the MRP area segments. You can display the **change log** by choosing 🖼 *Display change documents* in the overview list for the assigned MRP areas. In the document overview, you can display the details for the selected document by choosing 🖼.

Maintenance of Mass Data

Use

When using MRP with MRP areas, it can be necessary to assign a material to a large number of MRP areas. That is the case, for example, with spare part storage for customer service technicians, when a material is available in many cars and every car is planned as an individual MRP area.

Features

SAP provides six function modules (function group **MD_MGD1**), with which you can program your own mass transactions. The function modules are integrated in the example report **RMMDDIBE**.

These function modules include:

- Copy with plant or MRP area template (**MD_MRP_LEVEL_CREATE_AS_COPY**)

    You create new MRP area segments by copying the plant MRP data or by copying an existing MRP segment.

- Creation with MRP/forecast profile (**MD_MRP_LEVEL_CREATE_PROFILE**)

    You create MRP area segments by assigning an MRP profile or a forecast profile, both of which are records of previously defined standard information that have been saved as a profile.

- Creation with data (**MD_MRP_LEVEL_CREATE_DATA**)

    You create a new MRP area segment by entering concrete MRP or forecast data.

- Change with MRP/forecast profile (**MD_MRP_LEVEL_CHANGE_PROFILE**)

    You change existing MRP area segments by assigning an MRP profile or a forecast profile.

- Change with data (**MD_MRP_LEVEL_CHANGE_DATA**)

    You change existing MRP area segments by entering concrete MRP or forecast data.

- Set deletion indicator (**MD_MRP_LEVEL_CHANGE_DELETION**)

    You set or delete the deletion flag for MRP area segments.

    ⚠️

    The report only serves as an example and will not be maintained or enhanced by SAP.

Activities

You call up the example report **RMMDDIBE** as follows:

Choose *System* → *Services* → *Reporting* and enter the report name.

You can save the result of the report and call it up for checking using the transaction SLG1.

Planning Material Requirements with MRP Areas

Implementation Options

This process describes how to proceed to carry out material requirements planning with MRP areas.

Prerequisites

- You have converted the existing planning file entries at plant level to planning file entries at MRP area level.

- You have activated MRP for MRP areas in Customizing.

- You have defined the MRP areas in Customizing.

- You have assigned the MRP areas to the materials in the material master.

See also:

Preparing for Material Requirements Planning with MRP Areas [Page 119]

Process Flow

1. You create the **independent requirements** of a material for an MRP area. To do this, the following options are available:

   - In Demand Management, you can create the Planned Independent Requirements [Ext.] of the materials for each MRP area. However, this is only possible if you use the *make-to-stock production* planning strategy.

   - You can create a sales order and specify a storage location. This customer requirement is assigned to an MRP area using this storage location.

   - You can also carry out material requirements planning for the individual MRP areas based on forecast requirements. You can carry out the material forecast for each MRP area of a material separately.

     With finished products or important assemblies that are planned using planning strategies, such as the planning strategy *Planning without final assembly*, you enter independent requirements at plant MRP area level, as make-to-order production is planned at plant MRP area level.

2. You **plan material requirements**. During total planning with the planning unit **plant**, the system plans the MRP areas (if they exist) for each material one after the other and then plans the rest of the plant.

   You can, however, start a total planning run specifically for one or more particular MRP areas. For this, you must maintain the **scope of planning** correspondingly in the IMG activity *Define scope of planning for total planning* in Customizing for MRP.

3. You **evaluate the results of the planning run**. In the MRP list and in the current stock/requirements list, you can specifically display and process the planning results of a material for each individual MRP area.

In the collective display of MRP lists or current stock/requirements lists, you can specifically select materials for one MRP area or for all MRP areas of a plant. However, the **segregated lists** are always calculated **for each MRP area**.

If you choose the evaluation *Situation - prod.grp*, you are provided with a complete overview of all MRP areas of a material. This is, however, only possible if you have defined the material as a product group.

Material Requirements Planning with MRP Areas

Implementation Options

This process contains technical information on how the planning run works with MRP areas. The process is to a great extent the same as the planning run at plant level.

Process Flow

1. The system checks in the **planning file** whether a planning file entry exists for the material in the MRP area that is to be planned.

2. The system **calculates net requirements** for the material in the MRP area. During this calculation, the system checks whether the requirements that exist for the MRP area can be covered by the available stock in the MRP area and the planned receipts for the MRP area. If there is a shortage of stock, the system creates a procurement proposal for the MRP area.

3. The system **calculates procurement quantities**. If you have defined a lot-sizing procedure in the MRP area segment of the material master, the system calculates using this lot-sizing procedure.

4. The system carries out **scheduling** using the parameters defined in the MRP data of the material master.

5. The system determines the type of **procurement proposal** for the MRP area on the basis of the procurement type that is defined in the material master (see also Determining the Procurement Proposal [Page 92]). You can also have Delivery Schedules [Page 134] created for the MRP area of a material.

   If you have defined a different *special procurement type* in the MRP area segment, the system creates the corresponding procurement proposal, for example, stock transport requisitions for the special procurement *Stock transfer from plant to plant*.

   With the special procurement keys, which are entered into the MRP area segment, the material requirements planning for the MRP area only takes into account the settings for special procurement types that do not refer to the BOM explosion.

   The settings for stock transfer are taken into consideration, for example, in contrast to the special procurement key *Phantom assembly*, which refers to the BOM explosion.

6. For every procurement proposal for an assembly, the system explodes the BOM and determines the dependent requirements.

   In order for the system to be able to determine requirements at MRP area level, you must ensure that the storage location determined during the planning run is the same as the storage location that is defined in the MRP area (see Determining and Assigning Storage Locations to the MRP Area [Page 132]).

   If you have entered an *MRP group* in the MRP area segment, the system uses the parameters that are defined in the *MRP group* during the planning run. The only exceptions to this are: the *strategy group*, the parameters for the *consumption mode*

and *period of adjustment* and the *checking rule for dependent requirements* in the case of the *availability check.* Even if you have defined these parameters in the MRP group, the system still uses the parameters from the MRP data of the material master.

Determining and Assigning Storage Locations to the MRP Area

Use

You assign goods receipt and issue elements to an MRP area using the receiving storage location in the case of receipt elements, and using the issuing storage location in the case of the issue elements.

Prerequisites

- You have defined the MRP areas in Customizing for MRP.

- You have assigned the MRP areas to the materials in the material master.

- You have defined the issuing storage location for the components.

- You have defined the receiving storage location for the assemblies.

Features

Assigning the Receipts and Issue Elements to an MRP Area

The **receipt elements** (planned orders, purchase requisitions and so on) are assigned using the receiving storage location, which the system determines during the planning run. The receiving storage location is displayed in the MRP list or the stock/requirements list in the column *Storage location* or it is displayed in the procurement element itself, for example, in the header data of a planned order. The system checks whether the receiving storage location that has been determined belongs to the MRP area. If this is the case, the system assigns the receipt element to the MRP area.

The **issue elements** (planned independent requirements, sales orders, dependent requirements, reservations) are assigned via the issuing storage location, which the system determines during the planning run. The issuing storage location is displayed in the MRP list or the current stock/requirements list in the column *Storage location* as well as in the component list of the planned order.

> 💡
>
> If the system is unable to determine a storage location, the system assigns the receipt or issue element to the plant MRP area.

Determining the Storage Location for Receipt Elements

You can maintain the receiving storage location for a material on various screens in the system:

- as receiving storage location for repetitive manufacturing in the **production version**

- either as production storage location (in-house production) or as external procurement storage location (external procurement) in the **MRP area segment** of the material master or in the material master itself

- as receiving storage location in Customizing for MRP in the IMG activity *Define MRP areas*

The system determines the storage location as follows:

1. First of all, the system checks whether a **valid production version** has been created. If this is the case, the system copies the receiving storage location from the production version into the receipt element. If this storage location belongs to an MRP area that has been assigned to a material, the system assigns the receipt element to the MRP area. If the storage location that has been determined belongs to the plant MRP area, the system assigns the receipt element to the plant MRP area. If this storage location does not belong to an MRP area that has been assigned to a material, nor to a plant MRP area, the system ignores the storage location.

> ⚠️
>
> In the case of external procurement, the system does not take into account any production version, which may be available, when determining the storage location.

- **Example 1: (Assembly with two Production Versions)**

   An assembly is assigned to two MRP areas of the storage location type and can be manufactured on two different production lines (line 1 and 2). You have therefore created two production versions for the assembly:

   version 1 with production line 1 and the receiving storage location 0001

   version 2 with production line 2 and the receiving storage location 0002

   You have defined one MRP area each for both storage locations and you have created the MRP area segments in the material master.

   During the planning run, the system determines the production version on the basis of its settings that is valid for the procurement proposal, for example, production version 1. In doing so, the system assigns the receipt element to the MRP area of the storage location 1.

- **Example 2: (Assembly with one Production Version)**

   An assembly with two different MRP areas is manufactured on a production line. You have therefore only created one production version. In this case, you are not allowed to maintain storage locations in the production version, as otherwise it would always be assigned to the same MRP area.

2. If a production version does not exist, the system checks whether you have defined a storage location in the **MRP area segment** (either a production storage location for in-house production or an external procurement storage location for external procurement). If this is the case the system adopts this storage location.

3. If you have not maintained any of these storage locations, the system adopts the **receiving storage location,** which you entered for the MRP area in **Customizing** in the IMG activity *Define MRP areas*.

Determining the Storage Location for Issue Elements

The system determines the storage location for the issue of components during the BOM explosion in the planning run. The system proceeds as described in Storage Location Determination in BOM Explosion [Ext.].

The storage location found determines the assignment to the MRP area.

Determine Source of Supply for Delivery Schedules for MRP Areas

Use

If delivery schedules for an MRP area are to be created during the planning run, the system must determine a **valid vendor** or a **valid delivery** schedule.

You create delivery schedules and use message management by making entries in the **source list**.

Prerequisites

- You have created a *Scheduling agreement* for each MRP area of a material.

- You have entered a receiving storage location in the scheduling agreement, which belongs to the MRP area.

  ⚠️

    You are only allowed to create one scheduling agreement for each vendor and receiving storage location.

- You have created an individual item for each scheduling agreement in the source list of the material.

- You have set the *MRP* indicator to *2* for *Record relevant to MRP. Sched. lines generated automatically* in the source list for each scheduling agreement item.

Features

A delivery schedule is assigned to an MRP area using the **storage location** that is entered in the **scheduling agreement**.

The system reads the **source list** for every material during the planning run. The system attempts to determine a valid vendor whose storage location belongs to the MRP area. If the system finds a valid scheduling agreement, it creates a delivery schedule for the MRP area of the material.

  ⚠️

    There is only one quota agreement for each material and plant. When planning at MRP area level, only quota arrangement items are adopted that have a storage location, which belongs to the MRP area.

Activities

You can maintain the scheduling agreement in the Purchasing task level menu: *Outline agreement → Scheduling agreement → Create → Vendor known*.

You can maintain the source list in the *Purchasing* task level menu by choosing, *Master data → Source list → Maintain*.

Stock Transfer from Plant to MRP Area

Use

- If you want to plan material requirements for a **storage location** separately, you can create an MRP area for this storage location. You can then procure materials that are planned for this MRP area using *Stock transfer from plant to MRP area.*

- If you plan components to be provided for a **subcontractor** using an MRP area of the *subcontractor* type, you can also procure the components to be provided using *Stock transfer from plant to MRP area*.
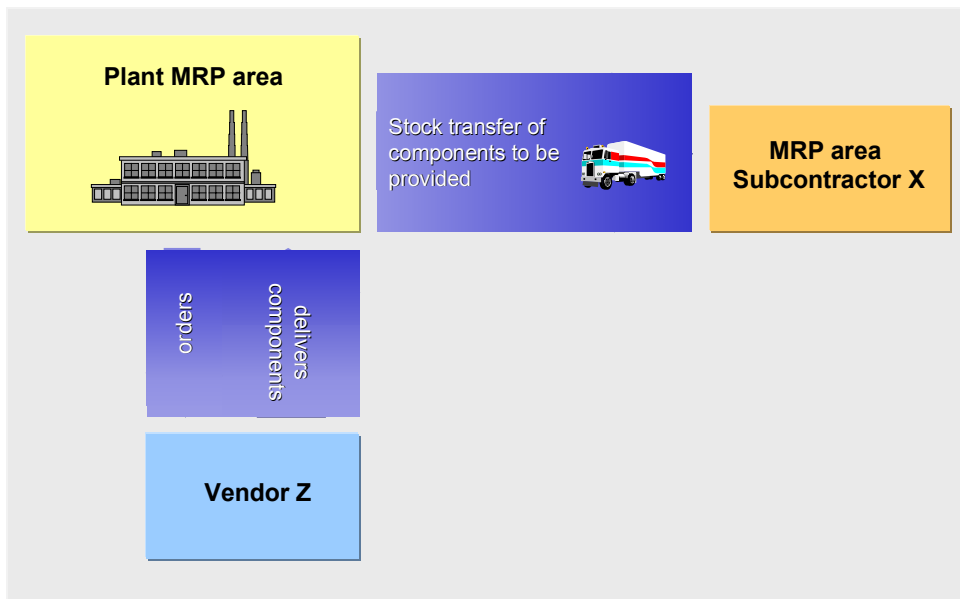
Integration

The process is the same as for Storage Location MRP [Page 108]. In contrast to the storage location MRP, you can use all MRP procedures and are not limited to the reorder point planning procedure.

Prerequisites

- In Customizing for MRP, you have created the *special procurement key* for *Stock transfer from plant to MRP area* for the plant in which the MRP area is located. You have defined the following parameters:

    – *Procurement type*: *F* for *External procurement*

    – *Special procurement*: *U* for *Stock transfer*

    – *Plant*: Number of plant, to which the MRP area belongs.

- In the material master, you have created the MRP area segment and assigned the special procurement key *Stock transfer from plant to MRP area.*

Stock Transfer from Plant to MRP Area

Features

During MRP, the system generates a stock transfer reservation for the material in the MRP area and a material reservation in the plant MRP area.

The external procurement storage location that you have entered in the MRP area segment of the material master is used as the receiving storage location. If you have not maintained this field, the system uses the receiving storage location that you entered for the MRP area in Customizing.

The actual procurement is processed by the plant. With stock transfer to the MRP area, you carry out the transfer posting for the material with reference to the reservation.

Example: MRP for Two Storage Locations

Using an MRP area, you can group two storage locations into one MRP area which means that you can plan and procure materials for these two storage locations separately from your planning at plant level.

Example data:

- Materials A, B, and C are stored in storage locations 0001 and 0002 and are withdrawn for production. They are planned using reorder point planning. Both storage locations are to be planned together. Storage location 0001 is the receipt storage location for the procurement elements.

Prerequisites

- In Customizing for MRP, you created an **MRP area, type storage location** for the two storage locations 0001 and 0002 which you assigned to the storage locations.

- You assigned this MRP area to the material master records of materials A, B and C by creating an **MRP segment**. In the MRP segment, you entered the storage location 0001 in the *External procurement storage location* as this is also the receipt storage location for the components.

Procedure in planning

In the planning run, the system checks the stock in storage location 0001 and0 002 for each material. If the stock level falls below the available stock (=total available stock in both storage locations), the system creates a procurement element for the replenishment quantity.

When determining the procurement elements for B and C, the system reads the external procurement storage location and uses this as the receipt storage location. This is storage location 0001. This means the procurement elements of the MRP area you created for storage locations 0001 and 0002 are assigned to storage location 0001.

Carrying Out the Planning Run (PP-MRP-PR)

Implementation Options

You use the *Planning execution* (PP-MRP-PR) component for **planning material requirements** for all materials or assemblies whose requirements or stock situation has changed.

To do this, you start a **planning run**.

Features

- You can execute a planning run

  - for a plant, several plants, an MRP area, several MRP areas or a combination of these (**total planning**)

  - for a single material or product group (**single-item planning**).

- The following **functions** are provided:

  - Total planning

  - Single-item, single-level planning

  - Multi-level single-item planning

  - Interactive planning

  - Multi-level, make-to-order production

  - Individual project planning

    You can find information on individual project planning in the SAP documentation for the *Project System.*

- In consumption-based planning, total planning and single-item planning are only executed on a single level.

- Interactive planning is not useful in long-term planning and is therefore not supported by this function.

- Using certain **control parameters**, you can determine how the planning run is to be executed.

Control Parameters for the Planning Run

Use

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.

Features

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.

- **Scheduling**

    You can choose basic date calculation or lead time scheduling.

Planning Run Type in the Initial Screen

Use

You use the planning run type (*Processing key* indicator in the initial screen of the planning run) to determine which materials are to be planned.

Features

There are three different planning run types:

- During **regenerative planning**, all materials are planned for a plant. This makes sense when you are carrying out the planning run for the first time as well as later during production if data consistency cannot be guaranteed due to technical error.

  The disadvantage of regenerative planning is the fact that the system has to deal with high capacity loads because all materials are planned, including materials, which may not be affected by the planning run.

- To overcome this disadvantage, it makes sense during production to carry out the planning run using the **net change planning** procedure. The only materials that are included in the planning run are those, which have undergone a change relevant to MRP since the last planning run, for example, because of warehouse issues or sales orders, changes to the BOM and so on.

  The net change planning procedure makes it possible for you to execute the planning run in short intervals, for example, in daily intervals. You can thus always work with the most up-to-date planning result.

- You can use **net change planning in the planning horizon** to shorten the MRP planning run even further. The system then only plans materials that have undergone a change relevant to MRP **within the planning horizon**. In order to also plan changes outside of the planning horizon, you must execute the net change planning run in greater time intervals.

  You define the planning horizon per plant or per MRP group in Customizing for MRP in the IMG activity *Define planning horizon.* The planning horizon should be at least long enough to cover the period when sales orders are received. It must also accommodate delivery periods and the total lead times of the materials.

  In single-item planning, you can only choose between net change planning and net change planning in the planning horizon. Regenerative planning is not useful, because the material has already been defined and does not have to be determined after the evaluation of the planning file.

The system automatically flags the materials that have undergone a change relevant to MRP with a corresponding **planning file entry** in the **planning file** (see also Checking the Planning File [Page 49] and Planning Run Type [Page 51]).

Creation Indicator

Use

The creation indicators (*Create purchase requisitions, schedule lines* and *create MRP list* indicators) define the following:whether **planned orders**, **purchase requisitions** or **schedule lines** should be created for materials procured externally

- whether **MRP lists** are to be created or not.

Features

Creation Indicator for Purchase Requisitions

You use this creation indicator to control whether purchase requisitions rather than planned orders are to be created for materials that are procured externally. The following options are available:

- planned orders only

- purchase requisitions only

- purchase requisitions within the **opening period** and planned orders outside of the opening period.

    When you select this indicator, the system creates purchase requisitions instead of planned orders when it determines an opening date that is before the date of the planning run.

    The opening period for the planned order represents the number of workdays that are subtracted from the order start date in order to determine the order opening date. This period serves as a time float, which is available for the MRP controller when converting a planned order into a purchase requisition.

    You define the opening period for the planned order in Customizing for MRP in the IMG activity *Define floats (scheduling margin key)* and assign it to the material in the *Scheduling margin key* field (*MRP 2* view) in the material master.

Creation Indicator for Schedule Lines

You use this creation indicator to control whether schedule lines are to be directly created for materials that are procured externally. The following options are available:

- no schedule lines

- only schedule lines

- schedule lines within the **opening period** and purchase requisitions outside of the opening period.

So that schedule lines can be generated automatically by the planning run, the following **prerequisites** must be met:

- You have created a scheduling agreement for the material.

- For the material, there is a valid entry relevant to MRP in the source list.

For more information, see <u>Determining Source of Supply for External Procurement [Page 97]</u>.

Creation Indicator

Creation Indicator for MRP Lists

Using this creation indicator, you determine whether the result of the planning run is to be stored in the form of MRP lists. These MRP lists can be evaluated after the planning run according to various aspects. The following options are available:

- no MRP lists

- always MRP lists

- MRP lists only in certain exceptional situations that are documented in exception messages.

    You determine for which exception messages the system is to create MRP lists in Customizing for MRP in the IMG activity *Define and group exception messages*.

    Even if you do not save any MRP lists, the procurement proposals generated by the system are stored in the database. You then process the results of the planning run by means of the stock/requirements list instead of the MRP list.

Creation Indicators in the Initial Screen and the MRP Group

Use

You can maintain creation indicators in two places:

- in the **initial screen of the planning run**

- in the **MRP group**.

  Maintaining them in the MRP group is useful, if planning for each plant is not specific enough for your purposes and you would like to assign control parameters that differ from the control parameters defined for the plant to certain material groups.

  You define the creation indicators for MRP groups in Customizing for MRP in the IMG activity *Define creation indicator.* You then assign the materials in the material master (*MRP 1* view) to the MRP group.

Features

Single-item planning and total planning take into account the settings for the MRP groups using different logic:

- **Logic Used in Total Planning**

  The creation indicators that you enter manually at the start of a planning run are only defaults. They are only valid, if the SAP system does not find a creation indicator for the MRP group.

  You can maintain an additional plant-specific entry for the creation indicator for delivery schedule lines. When a plant-specific entry exists, the following applies:

- The system checks first whether the material has been assigned to an MRP group, for which the creation indicators have been maintained.

- If this is not the case, it checks whether there is a plant-specific entry.

- If this is also not the case, it uses the creation indicator from the initial screen.

- **Logic Used in Single-Item Planning**

  In single-item planning, only the settings from the initial screen of the planning run are used. The Customizing settings for the MRP group have no effect.

Planning Mode in the Initial Screen

Use

The planning mode (*Planning mode* indicator in the initial screen of the planning run) controls 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. Firmed procurement proposals remain unchanged.

The planning mode is set automatically in the planning file. However, you can overwrite it in the initial screen of each planning run.

By choosing the correct planning mode, you avoid planning materials twice and thereby optimize system performance.

Features

The following options are available:

- **adapt existing planning data** (planning mode 1)

- **re-explode BOM after change to BOM** (planning mode 2)

- **delete planning data** and recreate procurement proposals (planning mode 3)

For more information on planning modes, refer to Planning Mode [Page 53].

The planning mode set in the **planning file** for a material can be overruled by the planning mode in the **initial screen of the planning run**. The following applies to this: For planning a particular material the planning mode that has the highest numerical value takes priority. Planning mode 2 (re-explode BOM) thus takes priority over planning mode 1 (adapt planning data), planning mode 3 (delete and recreate planning data) takes priority over planning mode 1 (adapt planning data) and planning mode 2 (re-explode BOM).

It is usually sufficient to set planning mode 1 in the initial screen of the planning run. If you have to plan a material with another planning mode, the system then sets the corresponding planning file entry in the planning file. The system evaluates this in the planning run.

> It is important to set the planning run to planning mode 2 or 3 in the initial screen if changes have been made in Customizing or the routing, because no planning file entries are created automatically for the materials affected by these changes.

Scheduling Control in the Initial Screen

Use

You use the *Scheduling* indicator in the initial screen of the planning run to determine exactly how planned orders for materials that are produced in-house are to be scheduled. The indicator is relevant for all planned orders that are new or have been changed or have had their BOM reexploded.

Features

The following options are available:

- determination of **basic dates** (planned dates)

- **lead time scheduling**.

    Lead time scheduling calculates the precise start and finish dates for production. The system only creates capacity requirements if lead time scheduling has been carried out.

For more information, see Scheduling [Ext.].

⚠️

    The system continues to use lead time scheduling for planned orders that have already undergone lead time scheduling. This is even applies if you choose basic date determination in the initial screen.

💡

    In consumption-based planning, the determination of basic dates is normally used as it deals with materials that are procured externally.

Total Planning

Use

Total planning covers the **planning of all the materials that are relevant for requirements planning** and includes the **BOM explosion** for materials with a bill of material.

You can use total planning for a single plant or you can use the **scope of planning** to control whether the total planning run is executed on a **multi-plant level**

- for several plants

- for one MRP area

- for several MRP areas

- for a combination of plants and MRP areas.

Prerequisites

Only for multi-plant planning with **scope of planning**:

- You have grouped together the plants or alternatively the MRP areas, which are to be planned together, in Customizing for MRP in the IMG activity *Define scope of planning for total planning*.

- In Customizing for MRP, you have made the necessary settings for Parallel processing [Page 151] in the IMG activity *Define parallel processing in MRP.*

Features

Defining the Scope of Planning

- You can define different scope of planning groups in Customizing.

- You specify the sequence of the individual MRP units (plants or MRP areas) for each scope of planning by entering a counter. This counter defines the sequence in which the MRP units are to be planned.

- You can enter as many plants as you like in the scope of planning.

- If you have activated material requirements planning with **MRP areas**, the entry of a plant thus includes all the MRP areas of this plant. During the planning run, the MRP areas of a plant are always planned in the following sequence: plant MRP area, storage location MRP area, subcontractor MRP area.

- You can, however, also enter one or several MRP areas in the scope of planning and thus restrict the total planning run to these MRP areas.

Executing the Total Planning Run for the Scope of Planning

You can execute total planning with scope of planning either online or as a background job.

> The planning run always has to be started with parallel processing.

With stock transfer or production in alternative plant, the system creates the corresponding planning file entries in the alternative plant. If the alternative plant is included in the scope of planning, the system continues to plan the materials in the alternative plant. If the alternative plant is not included in the scope of planning or if you plan for a single plant without entering a scope of planning, the system does not plan in the alternative plant.

Carry Out Total Planning Online

1. Starting from the MRP node, choose *Planning → Total planning → Online*.

   This takes you to the initial screen for the total planning run.

2. Enter the plant, for which you want to carry out the total planning, or enter the number of the scope of planning.

3. Specify the control parameters you desire (see Control Parameters for the Planning Run [Page 139]).

   ⚠️

   The creation indicator for purchase requisitions is only valid if the MRP group does not override it. The creation indicator for scheduling agreement schedule lines is only valid if the MRP group or the plant entry in Customizing does not override it (see Creation Indicators in the Initial Screen and the MRP Group [Page 143]).

   💡

   If you want to save the parameters set in the initial screen, for the following total planning, choose *Settings → Save.* The parameters saved become the default for each following planning run.

4. If you work with scope of planning, set the indicator for *Parallel processing*.

5. Choose ✔ .

   The system displays the long texts explaining the settings selected.

6. Check the settings and choose ✔ again.

Result

The system carries out total planning for the plant selected or for the scope of planning you have defined. The individual plants or MRP areas are planned in the sequence defined.

When you have completed the planning run you receive statistics with information on the scope of planning, exceptional situations and terminations. You can also see how much time is required for the planning run in total and for planning the individual materials.

To limit the scope of these statistics you can set the number of materials used, in Customizing for MRP under *Activate runtime statistics.*

💡

If you carry out the total planning in the background, you can print these statistics.

If you have selected the field *Display material list* in the initial screen of the planning run, the list of the materials planned is displayed above the statistics. If you position the cursor on a specific material in the list and choose 🔳 *MRP list* or 🔳 *Stock/ requirements list,* this takes you directly to the appropriate list and from there you can test the planning result.

Execute Total Planning in Background Mode

1. Starting from the Material Requirements Planning node, choose *Planning* → *Total planning* → *As background job.*

    The *Total planning: Variants* screen appears.

2. Choose 🗋 *Create variant*.

    The variant contains the control parameters for the total planning run.

3. Enter a name for the variant and choose 🗋 *Create*.

    The system displays the *Variants: change screen assignment* dialog box. The system recommends the *BATCH structure for MRP run* screen.

4. Choose ✔ *Continue*.

    The recommendation is copied and this takes you to the initial screen for the total planning run.

5. Enter the control parameters that the system is to use during the total planning run (see Control Parameters for the Planning Run [Page 139]) and, if you work with scope of planning, select the *Parallel processing* field.

6. Choose 🔧 *Attributes*.

    The *ABAP: Save Attributes of Variant XXX:* screen appears.

7. Enter a description for the variant in the *Description* field and choose 💾.

    This takes you to the initial screen for the total planning run again.

8. Choose *Variants* → *Exit*.

    The *Total planning: Variants* screen appears again.

9. Position the cursor on the variant and choose *Schedule job*.

    The *Total Planning Scheduling: Start Time* screen appears.

10. You define whether the variant created is to be scheduled just once or periodically.

Result

If you choose *Schedule once*, the planning run is carried out once on the date that you have specified and with the control parameters that you defined in the variant.

If you choose *Schedule periodically*, the total planning run is repeated at regular intervals.

💡

    If you run the total planning run in background mode, you can print out the protocol and the resulting statistics.

User Exit: Material Selection for the Total Planning Run

Use

You can use this user exit, which is predefined by SAP, to restrict the **total planning run to certain materials** that fulfil freely definable criteria. For example, you can thus determine that

- only materials planned using MRP or

- only materials for a particular MRP controller or

- only materials procured externally or in-house

are to be planned.

Prerequisites

- You have defined the key and descriptive text for the user exit in Customizing for MRP in the IMG activity *User exit: Material selection for planning run.*

- You have activated the user exit within the framework of the SAP enhancement concept. The name of the **enhancement** is **M61X0001**.

Features

The system calls up the user exit for every material, after the corresponding planning file entry and the data in the material master has been read. Using the user exit, you can exclude the material from the planning. The planning file entry remains unchanged.

Activities

Enter the key for the user exit and, if necessary, a corresponding parameter in the initial screen of the total planning run.

Parallel Processing

Use

Using parallel processing functions, you can significantly shorten the **runtime of the total planning run**. For parallel processing, you can also choose to use **various sessions** on one server or to use **various servers**.

Prerequisites

In Customizing for MRP, you have made the necessary settings for parallel processing in the IMG activity *Define parallel processing in MRP*, that means, you have defined the corresponding destinations (application servers) with the number of sessions available.

Features

Parallel processing is carried out on the basis of the **low-level code** logic:

A package of a size to be determined is distributed per RFC (Remote Function Call) to the individual server/tasks. Once a task has completed processing one package, the next package of the same size is processed. Once a low-level code is completed, the finished tasks must wait until the last package is also complete in order to avoid inconsistencies. Then the next low-level code is processed package by package.

You can use parallel processing for the total planning run online as well as a background job. It is activated in the initial screen.

Carrying Out Single-Item, Single-Level Planning

Use

Single-item planning only involves the **planning of one individual material**. Single-level means that the BOM is not exploded and that, therefore, only the **level directly below the material** is planned.

Procedure

1. Starting from the MRP node, choose *Planning → Single-item planning, single-level*.

   This takes you to the initial screen for single-level single-item planning.

2. Enter the material number, for which you want to carry out single-item planning, and also the plant or planning area, in which you want to plan.

3. Specify the control parameters you desire (see Control Parameters for the Planning Run [Page 139]).

   ⚠️

   In single-item planning the creation indicators in the initial screen overwrite the creation indicators in the MRP group (see Creation Indicators in the Initial Screen and the MRP Group [Page 143]).

   💡

   If you want to save the parameters set in the initial screen, for the following planning, choose *Settings → Save.* The parameters saved become the default for each following planning.

4. Choose ✔.

   The system displays the long texts explaining the settings selected.

5. Check the settings and choose ✔ again.

Result

Single-level single-item planning is carried out for the material selected.

If you select the *Display results before they are saved* field in the initial screen, the planning result is displayed and you can still make changes before you save it to the database. For more information, see Working with the Planning Result [Page 153].

Working with the Planning Result

Use

The planning result display allows you to **adjust and test the result**.

Prerequisites

You have either:

- selected the field *Display results before they are saved* in the initial screen of the single-item, multi-level planning run and started the planning run

- or started the interactive planning run.

Procedure

Function	How to call up function	What you should know
Hide and show header details for the material	🗔, 🗁	The header details point to various tab pages for master data and movement data for the material selected. You define the sequence of the tab pages in Customizing for MRP under *Define Screen Sequence for Header Details.*
Enter or display material memo	📝	Next to the symbol for the material memo the name and date of the last change are displayed.
Display the exception message	Position the cursor on the exception message and choose 🛈	
Display additional data for the MRP element.	🗒 Next to the MRP element	
Activate period totals display	Σ	
Change procurement proposal	Double-click the procurement proposal	In the lower section of the screen is an area with the data of the procurement proposal selected and here you can make your changes. Copy the changes with ✔ . The procurement proposal is firmed automatically. Firmed procurement proposals are not adjusted in the planning run. Note also the firming logic of the master production scheduling (see Firming Type [Ext.]).

Working with the Planning Result

Reschedule procurement proposal	Position the cursor on the procurement proposal and choose 🖼	If the system issues a rescheduling proposal for the procurement proposal, the procurement proposal is automatically rescheduled to this date. If the system does not issue a rescheduling proposal, a dialog box appears in which you can enter the MRP date desired.
Add procurement proposal	📄 *Procurement proposal*	After you have defined the type of procurement proposal, you can enter the relevant data in the lower section of the screen. If you choose *Enter*, the stock/requirements situation changed by the procurement proposal is visible immediately. Transfer the data with ✔ .
Delete procurement proposal	Position the cursor on the procurement proposal and choose 🗑	
Add/change production order	📄 *Production order* or 🖉	This function is only available in single-level single-item planning and in interactive planning.
Change or add components of a planned order	Double-click the planned order and choose *Goto* → *Maintain material components or Enter material components*.	This takes you to the component processing. Here, you can: • change requirement quantities or dates directly • call up the detail data for the components in the lower screen area, by double-clicking the components. • add new components via *Detailed entry* or *Collective entry*.
Explode BOM again	Double-click the planned order and choose *Goto* → *Explode BOM*	The BOM is exploded again and the component processing appears.
Check availability of the components of a planned order	Double-click the planned order and choose *Goto* → *Check availability*	

Plan capacity for material	Double-click the planned order and choose *Goto* → *Capacity planning* → *Capacity leveling* → *Material view*	The indicator for scheduling in the initial screen of planning must be set so that lead time scheduling is carried out. For further information on capacity planning see the SAP document *PP-Capacity planning*.
Plan capacity for planned order	Double-click the planned order and choose *Goto* → *Capacity planning* → *Capacity leveling* → *Order view*.	See above
Print planning result		

Evaluating the Planning Result

Purpose

The following evaluations are available for evaluating the planning results in consumption-based planning:

- MRP list

- Current stock/requirements list

Integration

You find the evaluations of consumption-based planning by starting from the Materials Management node and by choosing Materials planning → MRP.

MRP List and Stock/Requirements List

Definition of the 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.

Stock/Requirements List

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.

Comparison

- The screen layout of both lists is basically the same.

- The system automatically runs the rescheduling check directly when both lists are created and puts forward rescheduling proposals.

- The number of exception messages displayed in each list is roughly the same. The only difference lies in the fact that, due to the nature of the list, no exception messages can occur for newly planned MRP elements in the stock/requirements list.

- Directly after the planning run, both lists contain the same information. As soon as a change relevant to MRP is made, the system updates the information in the stock/requirements list.

- As stock/requirements lists are subject to change, they cannot be set with a processing indicator.

Structure

Each MRP list is divided into a **header** and **items**.

Material data, such as the material number, the plant, and MRP parameters, is recorded in the MRP list header.

The items, on the other hand, contain information on the individual **MRP elements** (planned orders, purchase orders, reservations, sales orders, and so on). These are grouped by MRP data into individual **planning segments**. The beginning of each new planning segment is highlighted. The system carries out the net requirements calculation for each segment separately.

MRP List and Stock/Requirements List

Planning Segments

The following segments are individually displayed and individually planned:

- Net segment

    Consists of that part of the list for which the net requirements calculation in planning was carried out on plant level.

- Gross segment

    Groups together the gross requirements and the corresponding procurement proposals for gross requirements planning.

- Storage location segment

    For every separately planned storage location or for every location, which is not included in MRP.

- Individual customer segment

- Individual project segment

- Segment for planning without final assembly

    Displays the requirements that are planned without final assembly. This means that their procurement is triggered by the incoming sales orders and non-convertible planned sales orders with the order type VP.

- Segment for direct production planning

- Segment for direct procurement planning

- Direct production segment

- Direct procurement segment

- Segment for the provision of material for subcontracting

Material Requirements Planning

Implementation Options

You use this process, if you are an MRP controller in a medium-sized company and are responsible for the whole of the **material requirements planning process** and **material availability**. After a normal MRP run, you check the stock/requirements situation for the planned materials, make necessary changes and save the availability of the materials for the next days.

Prerequisites

- You have completed an MRP run.

- You have configured the lists as you want (for example, a material tree, display of total replenishment lead-time).

    See Configuring Access to the Lists [Page 201]

- You have configured the material tree as you want (for example, the materials in the tree are to be grouped according to processing indicator).

    See Select Fields in the Tree [Page 203], Sort/Group Fields in the Tree [Page 205]

- You have configured the traffic lights as you want (for example, all materials with dates in the past as well as all materials with terminations are to have a red traffic light).

    See Define Traffic Lights [Page 214]

Process Flow

1. You choose collective access to the MRP lists (MD06) from the role-based menu for the MRP controller or from the personal favorites.

2. In the screen for collective access, you select your own materials according to MRP controller and plant and enter that you only want to see materials with new exceptions. The material list appears.

    See Using Collective Access for MRP Lists [Page 164]

3. In the material list, find the materials that have priority for processing with red traffic lights.

    See Searching for Information [Page 172]

4. You copy these materials to the worklist tree. At this point, all of your materials are in the group of materials with unprocessed MRP lists.

    See Material Tree [Page 202]

5. You call up the corresponding MRP list by double-clicking on the material in the tree and check which exception messages for this material have occurred during the total replenishment lead-time.

6. You double-click on every critical MRP element to call up the dialog window with the details for the MRP element. From the dialog window, you access the screen for processing the MRP element and, if necessary, change the dates or quantities after consulting the workshop, customers or vendors. The system then automatically firms the MRP elements, which you have changed manually.

    See Working with Individual MRP Elements [Page 184]

Material Requirements Planning

7. You check, if necessary, the result of the manual changes in the stock/requirements list. For critical quantity changes, you execute, if necessary, a new single-item planning run directly from the MRP list. You can use flexible transaction calls for this.

    See Flexible Transaction Calls [Page 208]

8. If necessary, you convert individual planned orders into production orders and individual purchase requisitions and thereby trigger the production or procurement. (A collective transaction for the conversion of a larger number of MRP elements is available.)

    See Working with Individual MRP Elements [Page 184]

9. Once you have completed the processing of a list, you set the processing indicator. The system automatically moves the material with the processed MRP list in the worklist tree to the group of materials with processed MRP lists.

    See Working with Whole Lists [Page 186]

10. You continue processing the MRP lists until the system has moved all materials in the worklist tree to the group of materials with processed MRP lists.

Result

The stock/requirements situation for your materials is cleared again.

Material Information

Implementation Options

- As a production scheduler, buyer, sales executive or MRP controller, you want to access information on the stock/requirements situation of a material and then gain an overview of the development of stock and requirements in the coming week. (1)

- As a production scheduler, you want to gain an overview of the MRP elements for in-house production (planned orders, production orders, process orders, maintenance orders, dependent reservations) or of the MRP elements for a particular production line. (2)

- As a buyer, you want to check which purchase orders and purchase requisitions exist for a material for a particular vendor. (3)

- As a sales executive, you are only interested in the current sales orders for a particular customer for a material. (4)

- In the case of make-to-order production (strategy group 10), sales orders do not increase requirements quantities, because the emphasis of this strategy lies on the smoothing of the demand program. As an MRP controller, you are interested in available quantities on the basis of sales orders that have actually been received and not on the basis of the planned independent requirements. You therefore want the planned independent requirements to be displayed, but do not want to change the available quantity. (5)

- As an MRP controller, you want to be informed about the requirements of bulk materials or materials that are planned using consumption-based planning in order to check whether these requirements occur continually. The system should also occasionally display and, if necessary, settle reservations and dependent requirements for these materials. (6)

Process Flow

11. You choose individual or collective access to the stock/requirements list (MD04/MD07) from the role-based menu for the MRP controller or from the personal favorites.

    See Using Individual Access for Lists [Page 163], Using Collective Access for the Stock/Requirements List [Page 166]

12. You can use numerous methods of displaying further information for each material. (Scenario 1)

    See Individual Line Display [Page 180], Display of Period Totals [Page 183]

13. If you want to display particular MRP elements but do not want to influence the available quantity calculation, choose a suitable display filter. This limits the display to the MRP elements that are currently of interest to you. (Scenarios 2-4)

    See Filtering Information [Page 174]

14. If you want to display particular MRP elements and want to define whether or not these are to be included in the available quantity calculation, choose a suitable selection rule. This allows you to have a new business view of the data. (Scenarios 5, 6)

    See Filtering Information [Page 174]

15. If you want to always work with a particular display filter or a particular selection rule, you can configure the list so that the display filter and selection rule are fixed settings.

Material Information

See

Using Individual Access for Lists

Use

You want to display the **stock/requirements situation for a particular material** in the MRP list or the stock/requirements list.

Prerequisites

- You have run MRP using single-item planning or total planning.

- For **MRP lists** only, you have entered in the control parameters for the planning run, that the system should create MRP lists.

Procedure

1. From the MRP menu or the MPS menu, choose the menu path *Evaluations → MRP list - material* or *Evaluations → Stock/reqmts list*.

    The system displays the initial screen for the respective list.

2. Enter the following data:

    − the material number of the material, for which you want to call up the list

    − the corresponding plant

    − (if MRP areas have been activated on a client basis) the corresponding MRP area

3. If required, choose a display filter and/or a selection rule (see Filtering Information [Page 174]).

    You define display filters and selection rules in Customizing for MRP in the IMG activity *Define display filter* and *Display selection rule.*

    You can only use selection rules for the stock/requirements list.

4. Choose ✔ .

    The system displays the descriptions of the chosen settings.

5. Check the settings and choose ✔ again.

Result

The system displays the chosen list.

Using Collective Access for MRP Lists

Use

You want to display the **stock/requirements situation for a series of materials** in the **MRP list**.

Prerequisites

- You have run MRP for the materials using single-item planning or total planning.

- You have entered in the control parameters for the planning run that the system should create MRP lists.

Procedure

2. From the MRP or MPS menu, select *Evaluations → MRP list collective display*.

    You now branch into the collective access screen.

2. In collective access:

    – Enter the *plant* and one of the following parameters: *MRP controller, product group, class* or *vendor*.

    If you do not enter any further selection criteria, the system selects all the materials assigned to this MRP controller, to this product group or to this vendor in the respective plant.

    – If the work with MRP areas is activated for a single client, you enter either the *plant* (= all MRP areas including the plant MRP area) or only one particular *MRP area*, and, in addition, either the *MRP controller*, the *product group* or the *vendor*.

    If you do not enter any further selection criteria, the system selects all the materials assigned to this MRP controller, to this product group or to this vendor in the selected MRP area or in all MRP areas. Materials that are assigned to five MRP areas are displayed, where applicable, with five MRP lists.

3. If required, enter further selection criteria.

    – *Date*: for example, all MRP lists that were created or processed within the last two weeks, or MRP lists for all materials with insufficient stock for the next two weeks.

    – *Exception groups*: for example, MRP lists for all materials for which the planning run was terminated (exception group 8).

    – *Processing indicator*: for example, all MRP lists that have not yet been processed.

    – *Material data*: for example, MRP lists for all materials that are procured externally.

4. If required, choose a display filter (see Filtering Information [Page 174]).

    For example, a display filter that only displays the planned orders for the next two weeks in the stock/requirements list for the materials assigned to a selected MRP controller.

    💡

    You can save all selection parameters by choosing the menu path *Settings → Save*. They are then predefined the next time that you access the transaction.

6. Choose ✔.

    The system displays long texts that describe the chosen settings.

7. Check the settings and choose ✔ again.

Result

The material list appears. This includes all the materials that fulfill your selection criteria (see Sorting Material Lists [Page 168], Creating Worklists [Page 170]).

> In the material list, you can display the ranges of coverage and the stock values using graphics and you can do this for more than one material at the same time (see Graphic Display [Page 188], Graphic Display of Lists [Page 190]).

Using Collective Access for Stock/Requirements Lists

Use

You want to display the **stock/requirements situation for a series of materials** in the **stock/requirements list**.

Prerequisites

You have run MRP for the materials using single-item planning or total planning.

Procedure

3. From the MRP or MPS menu, select *Evaluations → Stock/requirements list collective display*.

   You now branch into the collective access screen.

2. In collective access:

   − Enter the *plant* and one of the following parameters: *MRP controller, product group, class, vendor* and *production line*. In practice, the emphasis lies on the selection by MRP controller.

     If you do not enter any further selection criteria, the system selects all the materials assigned to this MRP controller (or the chosen selection) in the respective plant.

   − If the work with MRP areas is activated for a single client, you enter either the *plant* (= all MRP areas including the plant MRP area) or only one particular *MRP area*, and, in addition, one of the parameters *MRP controller*, *product group, class, vendor* or *production line.* In practice, the emphasis lies on the selection by MRP controller.

     If you do not enter any further selection criteria, the system selects all the materials assigned to this MRP controller (or the chosen selection) in the selected MRP area or in all MRP areas. Materials that are assigned to five MRP areas are displayed, where applicable, with five stock/requirements lists.

3. If required, enter further selection criteria.

   − *Material data*: for example, stock/requirements lists for all materials that are procured externally.

   − *File entries for MRP*: for example, stock/requirements lists for all materials with a file entry in the planning file.

4. Choose whether the stock/requirements lists should be created in the background first.

   If you select the *Set up lists in background* field, the lists are created, and the traffic lights, the calculated ranges of coverage and exception messages for the materials are shown in the material list that the system subsequently displays. As the creation of the lists can take a long time, the system displays a confirmation prompt if more than 25 materials are involved.

   If you do not select the field, the lists are not created, and the system displays them without traffic lights, with a calculated range of coverage of 0, and without exception messages in the material list that the system subsequently displays. In this case, the calculation of values in the lists only takes place when the materials are accessed individually.

5. If required, choose a display filter and/or a selection rule (see <u>Filtering Information [Page 174]</u>).

>   For example, a display filter that only displays the planned orders for the next two weeks in the stock/requirements list for the materials assigned to a selected MRP controller.

>   You define display filters and selection rules in Customizing for MRP in the IMG activity *Define display filter* and *Display selection rule.*

8. Choose ✔.

>   The system displays the descriptions of the chosen settings.

9. Check the settings and choose ✔ again.

Result

The material list appears. This includes all the materials that fulfill your selection criteria (see <u>Sorting Material Lists [Page 168]</u>, <u>Creating Worklists [Page 170]</u>).

>   In the material list, you can display the ranges of coverage and the stock values using graphics and you can do this for more than one material at the same time (see <u>Graphic Display [Page 188]</u>, <u>Graphic Display of Lists [Page 190]</u>).

Sorting Material Lists

Verwendung

You can determine that the materials that are in the **material list** after collective access to the MRP list or stock/requirements list are **sorted** according to certain criteria. For example, you want to sort the materials alphabetically according to material number.

Prerequisites

You have entered the required selection criteria in the collective access to the MRP list or stock/requirements list and have called up the material list of all the materials that correspond to these criteria.

Procedure

1. Choose 🖨.

   The system displays the *Sort* dialog box.

2. Enter the sequence number by which you want to sort the materials in the material list next to each field.

   You want to sort the *Traffic light, Planning plant, MRP area* and *Material* fields in this sequence. Enter:

Traffic light	1
Planning plant	2
MRP area	3
Material	4

   You want to change the defined sequence so that the material is first. Enter the following change:

Material	1

   The remaining fields are resorted automatically when you confirm the entry with `ENTER`.

3. Select the *Descending* field if you want to sort in descending order.

   A descending sort is only recommended for the following fields:

- *Traffic light*

   Materials with red traffic lights, which means those whose processing has priority, are displayed first (red is the highest value, green the lowest).

- *List created* (only stock/requirements lists)

   Materials for which a list has been created are displayed first (list created is the highest value, list not created is the lowest value).

- *Range of coverage*

    Materials with the highest days' supply, which means those with high stock levels, are displayed first (highest days' supply is the highest value, lowest days' supply the lowest).

- *Exception group*

    Materials with the most exception messages in this group are displayed first (the most exception messages per group is the highest value, the least exception messages the lowest).

4. Choose *Execute sort* to activate the settings for the current display, or 🔲 to save them permanently.

Result

The materials in the material list are sorted and grouped according to the selected fields.

Creating Worklists

Use

You want the system to create a **worklist of particular materials in the material list**.

Prerequisites

You have entered the required selection criteria in the collective access to the MRP list or stock/requirements list and have called up the material list of all the materials that correspond to these criteria.

The material list includes the following for each material: traffic light, ranges of coverage, the number of exception messages per exception group, the current plant stock, and various other material data.

Procedure

1. In the material list, select the materials for which you want to display the MRP lists or stock/requirements lists:

    − individual materials by clicking on the line

    − all materials by using 📇

    − a block of materials by clicking on the first and last line and then choose 📇.

    You can find the required materials in two ways:

    ▪ with the search function in the material list using 🔍. For example, you search for all the materials with stocks that are sufficient for less than two weeks.

    ▪ by sorting the material list using 🖨. For example, you sort the material list so that all materials for which an opening date in the past was determined (exception group 1) are displayed first.

2. To access the appropriate list, double-click the first material or choose 👓 *Selected stock/requirements lists* or 👓 *Selected MRP lists*.

    The system displays the list for the first material.

3. Choose *Show material tree*.

Result

The system displays all the materials that you selected in the material list in a worklist tree on the left-hand side of the screen. Double-click the appropriate material in this tree, or choose 📑 and 📑, to change from list to list.

Working with the Lists

Use

The MRP list and the stock/requirements list offer a wide range of **information about material availability**.

Prerequisites

You have called up the MRP list or the stock/requirements list for a material.

Features

You can show material data, choose between different views, filter information, access information from Customizing settings or from other applications, change between materials as required, and branch to many other transactions.

> As for all other tables, you can use the mouse to adjust the sequence and width of all the columns that are displayed as standard in the lists. You can save these settings as display variants by choosing 🔲 in the upper right-hand corner of the screen beside the table. Please note that this does not include additional columns that the system only displays when they have contents.

Searching for Information

Use

By using this function, you search specifically for **particular materials** or for **particular information for a material**.

Prerequisites

- You are in the material list, the MRP list, or the stock/requirements list.

- For searching in the tree: you have displayed the material tree in the form of a worklist tree.

Features

Searching in the Material List or in the Worklist Tree

- *Search in the materials* (according to name, range of coverage, exceptions, traffic lights and, in the material list for the MRP lists also according to processing indicator)

- *Search according to exceptions* (in the material list for the MRP lists, also according to new/old exceptions)

    The system only displays the exception messages that actually appear in the materials from the material list or from the worklist tree. The system also displays how often each exception message appears.

- *Search according to MRP elements*

If you are in the material list, the system selects the materials, which it has found, and goes through the list until the first material that it has found is at the top. If you choose 📇, the system goes through the list until the next material that it has found is at the top.

If you are in the worklist tree, the tree is shortened so that it only includes the materials that meet the search criteria.

> 💡
>
> If you, as the MRP controller, are looking for materials with new exceptions in the material list for the MRP lists, the system selects all materials that had new, unprocessed exception situations in the last planning run. If you are searching for materials with unprocessed MRP lists, the system selects all materials, for which you have not yet set a processing indicator.

Search in the Lists

- Search according to exceptions

- *Search according to segments*

- Search according to MRP elements

The system goes through the list until the first element that it has found is on the second line. If you choose 📇, the system goes through the material list until the first element that it has found is displayed on the second line.

Activities

Run the required search.

- In the material list or segregated lists: choose .

- In the worklist tree: choose in the application toolbar directly above the tree.

Filtering Information

Use

- You can use **selection rules** to define which MRP elements and which stocks are included in the quantity and stock calculation. You hereby define your own **business views**.

- You can use **display filters** to define which MRP elements and MRP segments are displayed. This enables you to reduce the information displayed to a **clear selection**.

You define display filters and selection rules in Customizing for MRP in the IMG activity *Define display filter* and *Display selection rule.*

> You can only use selection rules for the stock/requirements list, but not for the MRP list.

Prerequisites

You have accessed the initial screen or the main screen of the MRP list or the stock/requirements list.

Features

- A **selection rule** consists of particular time information, MRP elements and stocks that are grouped together in a rule, which controls the selection (or import) of the data in the stock/requirements list and the planning table for Repetitive Manufacturing:

  – The system only displays MRP elements in the period that is defined in the selection horizon.

  – The system only displays the MRP elements that are selected in the selection rule.

  – Of the MRP elements displayed, the system only takes those indicated as affecting availability in the selection rule into consideration for the calculation of the quantity available and the ranges of coverage.

  – The system only takes the stocks defined in the selection rule into consideration to calculate the unrestricted-use stock.

    This creates a new business view of the data in the lists.

- A **display filter** consists of particular time information, MRP elements, and MRP segments grouped in a filter that controls the display of the MRP list and the stock/requirements list.

  – The system only displays MRP elements in the period that is defined in the display horizon.

  – The system only displays segments in this period that are selected in the display filter.

  – Within these segments, the system only displays MRP elements that are selected in the display filter and that, if necessary, correspond to particular additional selections (for example, customer, vendor, storage location).

    The data in the lists is thus reduced to a clear selection.

In contrast to selection rules, the calculation of the quantity available and the ranges of coverage is not influenced by display filters.

- You can define the **selection horizon** for the selection rule as well as the **display horizon** and the **additional selections** for the display filter in two ways:

    − company-specific in Customizing

    − user-specific in the respective analysis list

Activities

1. Select the *With filter* field (initial screen) or choose ▽ (main screen) in order to show the *Display filter* and *Selection rule* fields.

2. Select a display filter and/or a selection rule.

3. Choose ▦ and, if necessary, enter a display horizon for the display filter or a selection horizon for the selection rule, which means a period to which you want to limit the display.

4. Choose ▦ and, if necessary, enter additional selections for the display filter, for example if you want to see MRP elements for a particular vendor or a particular customer.

　　　　💡

If you always work with a particular display filter and/or selection rule, choose ▣. The system displays the *Settings* dialog box. Use this to define that this display filter or selection rule should always be activated when you access the lists.

Working with List Header and Material Tree

Use

The list header contains **material data** from the material master and displays, if necessary, which **display filter** and which **selection rule** are active.

In the material tree, you can put together a **worklist** from the materials that are currently of interest to you.

Prerequisites

You have called up the MRP list or the stock/requirements list for a material.

Procedure

Function	How to call up function	What you should know
Hide and show header details for the material	🗗, 🗂	The header details point to various tab pages for master data and movement data for the material selected. Which tab pages are displayed depends on the MRP type. This enables you to display different data for consumption-based and requirement-based materials. There is a special tab page for the MRP list that shows, amongst other things, that exception messages exist for the chosen material.
		You define the tab page sequence in Customizing for MRP in the IMG activity *Define screen sequence for header details.*
Choose a further unit	*Unit* field	If different units of measure have been maintained for a material, for example, unit of issue in the warehouse and order unit for purchasing, you can display the lists for this material in two different units of measure at the same time.
		The system then displays the *Receipt/requirement* and *Available quantity* columns twice.

Calculate proportion quantities (only in stock/requirements lists)		For **active ingredient management** only: the system calculates the active ingredient quantity (proportion quantity) from the physical quantity in the proportion unit. To do this, the system reads the actual conversion factor of the batch information. If no batch information is available, it uses the planned conversion factor.
		The system then displays the *Receipt/requirement* and *Available quantity* columns twice.
		You can find further information on active ingredient management in the SAP document *Batch Management* under Batch Specific Units of Measure [Ext.].
Display inventory correction factor (only in stock/requirements lists)		For **active ingredient management** only: you can check which inventory correction factor the system has used to calculate stocks.
		You can find further information on the inventory correction factor in the SAP document *Batch Management* under Calculating the Inventory Correction Factor [Ext.].
Enter or display material memo		Next to the symbol for the material memo the name and date of the last change are displayed.
		Material memos are valid for both types of list.
Set processing indicator (only for MRP lists)		During the next planning run, the exception messages for this material are no longer considered to be new exceptions.
		This function is also supported in the material list.
Show and hide material tree	*Show/hide material tree*	See Material Tree [Page 202]
In the material tree: switch between the worklist tree, the order tree and the product group tree	, ,	
In the material tree: select fields in the tree		See Select Fields in the Tree [Page 203]
In the material tree: sort and group fields in the tree		See Sort/Group Fields in the Tree [Page 205]
In the material tree: define column widths	Change column width using the mouse	The column width is lost when you leave the list.

Working with List Header and Material Tree

In the material tree: define column sequence	Drag & Drop the column headers	The column sequence is lost when you leave the list.
Display material list		See Creating Worklists [Page 170]
Activate and deactivate display filter and selection rule	,	See Filtering Information [Page 174] You define display filters and selection rules in Customizing for MRP in the IMG activity *Define display filter* and *Display selection rule.*

Individual Line Display

Use

All MRP elements are **listed individually** in an individual line display. With this type of display, you can determine exactly which MRP elements **currently** have a **material shortage**.

Prerequisites

- You have called up the MRP list or the stock/requirements list for a material.

- You are in the individual line display. Choose 🔲 if you are still in the period totals display.

Features

If you use the global settings, the system displays the following columns for the items:

- Planning date

- MRP element data (short description, number, item, and so on)

- Rescheduling date

- Exception message key

- Receipt and requirements quantities, if necessary in two different units

- Available quantity (planned warehouse stock), if necessary in two different units

By scrolling with the mouse in the section of the screen to the right of the *MRP element* column, you can also display the following columns: *Start/release date, Opening date.*

If the corresponding data is available, the system also displays the following columns: *Scrap, Production version, Receiving plant, Issuing plant, Stock in transit, Storage location, BOM explosion number, Revision level.*

The system only displays the *Stock in transit* column if you use stock transfer between two plants and only displays it in the receiving plant. The stock in transit is the quantity that is in transport to the receiving plant.

If the corresponding data is available, you can access the customer and vendor columns (*Debitor/customer name* or *Creditor/vendor name*) via pushbuttons.

Individual Line Display

Function	Starting the function	What you should know
Switch between period totals display and individual line display	∑ , 🔲	
Sorting the individual segments by date of the first requirement or by segment number.	🔺 Date, 🔺 No.	
Display requirements individually or collectively	🔷, 🔷, 🔷, 🔷	If the *individual/collective* indicator for a material has been set in the MRP data of the material master so that collective requirements can be created, and if there are several dependent requirements for a material for one day, these dependent requirements can be grouped to a collective requirement. The collective requirements are indicated by the 🔷 icon, and the number of grouped dependent requirements is displayed. You can expand or collapse either individual or all collective requirements
Only for purchasing elements: display goods receipt date or availability date as requirements or receipt date	🔳 *GR,* 🔳 *AV*	The availability date is the date resulting from the addition of goods receipt processing time to the goods receipt date, which means the date on which the material is actually available for planning. The availability date is, therefore, after the goods receipt.
Activate and deactivate safety time	🔳 *ST on,* 🔳 ST off	The requirements are brought forward by the number of days that are defined in the safety time. You define the safety time in the MRP data for the material master (see also Safety Time/Actual Range of Coverage [Ext.]).
Show and hide total replenishment lead time	🔳 *On,* 🔳 Off	The system displays the total replenishment lead-time in the list in a separate row. This makes it clear up to which date the replenishment of materials is critical. You define the total replenishment lead-time in the MRP data for the material master.
Show and hide customer data	*Customer*	The system displays the *Customer* and *Customer name* columns, with customer numbers and customer names, for materials that are procured for a sales order.

Show and hide vendor data	*Vendor*	The system displays the *Vendor* and *Vendor name* columns, with the vendor name and number, for materials that are procured externally.

Display of Period Totals

Use

MRP elements are **grouped by period** for the period totals display. This type of display provides you with a faster overview of the **development** of material availability **over time**.

Prerequisites

- You have called up the MRP list or the stock/requirements list for a material.

- You are in the period totals display. Choose ![icon] if you are still in the individual line display.

Features

The **daily, weekly, or monthly** display is offered as standard. If have made appropriate settings in Customizing, you can display by **accounting period, planning calendar**, or by **individual period splits**.

> You define the period display in Customizing for MRP in the IMG activity *Define period display for period totals.*

The system displays the following columns:

- Planned independent requirement

- Requirement (customer requirements and reservations)

- Receipts (procurement proposals)

- Available quantity

- Actual range of coverage

When there are several procurement proposals for a material within the same period, the system displays cumulative quantities.

If range of coverage profiles have been defined in Customizing, and you have assigned a range of coverage profile to the material in the material master, the system displays additional range of coverage columns (see also Calculating the Statistical Range of Coverage [Ext.]).

Display of Period Totals

Function	Starting the function	What you should know
Switch between individual line display and period totals display	🔲, Σ	
Set individual split or planning calendar	🔳	See <u>Configuring Access to the Lists [Page 201]</u> You define individual splits and the planning calendar in Customizing for MRP in the IMG activities *Maintain planning calendar* and *Define individual period split for period totals*.
Display alternative period value	Choose tab index	
Set period value, which should be displayed in the foreground as a standard when the function is chosen	🔳	See <u>Configuring Access to the Lists [Page 201]</u>
Display individual MRP elements for a period	Double-click on period or click 🔍	The display is in the form of a split screen. The periods are listed in the top part of the screen. The selected period is highlighted. The system displays the MRP elements, which belong to the selected period in the lower part of the screen. The display in this area of the screen corresponds to that of the individual line display.

Working with Individual MRP Elements

Use

You have numerous possibilities for accessing information and processing functions for individual MRP elements. You can thus recognize material shortage situations quickly and rectify these by, for example, changing dates or quantities in an MRP element.

Prerequisites

- You have called up the MRP list or the stock/requirements list for a material.

- You are in the individual line display. Choose 🗒 if you are still in the period totals display.

- If required, you have positioned the cursor on the MRP element, with which you want to work.

Procedure

Function	Starting the function	What you should know
Display information for exception messages	Double-click on the message number of the message text	In the respective list, you access the descriptive text for a message number in the status line by double-clicking the number of the exception message. To access further information about the message, double-click the status line. In the details dialog box for an MRP element, you access further information about an exception message by double-clicking the exception message.
Display details for an MRP element	Double-click on MRP element or click once and choose 🖳	The system gives you additional information about the selected MRP element in a detail dialog box. For a planned order, for example, you are given the order number, order quantity, basic dates, and the two most important exception messages that occurred during the planning run. You can also • access the planned order yourself and change quantities or dates • convert the planned order directly into a production order • create your own link to planned order processing by using 🔆 (see Define User-Specific Transaction Calls per MRP Element [Page 211])

Set manual firming date	*Edit → Set firming date*	The manual firming date lengthens, if necessary, the planning time fence (see also Manual Firming Date [Ext.]). This function is only supported in the stock/requirements list.
Display order report for an MRP element		In an order report for a planned order, for example, the system determines and displays the dependent requirements with their planned receipt elements. This gives you an overview of the status for all BOM levels, which enables you to recognize possible bottlenecks in material availability much faster.
Display order tree for an MRP element		The system shows the order tree in the left section of the screen or you switch to the order tree from the material tree. In the order tree, the system displays all BOM items from the multi-level BOM hierarchically.
Display pegged requirements for the MRP element		When you display the pegged requirements for a dependent requirement for a raw material, for example, you can trace: • which requirements caused the dependent requirement • which independent requirements, especially sales orders, are endangered by the loss or change in date or quantity of a procurement proposal for this raw material.

Working with Whole Lists

Use

Functions that are relevant for whole lists are, for example, printing, deleting, and setting the processing indicator.

Prerequisites

You have called up the MRP list or the stock/requirements list for a material.

Procedure

Function	How to call up function	What you should know
Indicate MRP lists as processed or as unprocessed (also possible in material list)	Switch between ✔ (unprocessed) and ✔ (processed)	The quick-info for the icon ✔ displays the date when the MRP list was processed. During the next planning run, the exception messages for a material with a processed MRP list are no longer considered to be new exceptions. You can use the processing indicator in collective access for the MRP lists as a selection criterion.
Enter or display material memo	🖉	Next to the symbol for the material memo the name and date of the last change are displayed. Material memos are valid for a material in all lists.
Display documents for the material	📇 (only appears if documents are available)	Only in the **stock/requirements list**: The system displays a list of all documents that you have assigned to the material in the material master. When you select a document, the system displays it in an internal or external viewer. You determine the selection of the viewer in Customizing for document management in the IMG activity *Define workstation application*. You can find further information about the internal viewer under Viewer for Displaying Original Files [Ext.].
Display stock statistics	*Goto → Stock statistics*	By using 📊, you receive an apportionment of the cumulative receipts/issues quantities for each field of the stock statistics.
Display sales statistics	*Goto → Sales statistics*	

Reorganize MRP lists	*MRP → Environment → Reorganize MRP lists*	The MRP lists that are no longer required are deleted from the database. You can also reach this function via MPS.
Delete MRP lists manually	*MRP list → Delete*	MRP lists that have not been deleted manually are stored in the system until they are replaced by new lists from a subsequent planning run.
Display ATP quantity	*Environment → ATP quantities*	The availability overview appears (see Availability Overview [Ext.]). You can set a default checking rule for the calculation of ATP quantities in your personal settings (see Settings [Page 199]).

Graphical Display

Use

Information in the MRP list and the stock/requirements list always refers to a **concrete point in time**: for the MRP list, to the time of the last planning run; for the stock/requirements list, to the time of the transaction call.

You can now use the graphical display to display the **change in the stock situation** for one or more materials over a period of time.

The graphical display has the following advantages:

- You can see outliers (for large procurement quantities or shortage situations) quicker.

- You can compare materials with each other directly.

Integration

The graphical display can be accessed through the collective access to the MRP list or to the stock/requirements list in the respective material list. It cannot be accessed in the individual lists.

Prerequisites

- You have selected the collective access to the MRP list or the stock/requirements list and are now in the material list for the materials selected.

- System administration: you have set up the corresponding authorization for all users, who should have access to the stock value display:

  − authorization object M_MTDI_ORG (organizational levels for material requirements planning)

  − authorization field MDAKT (activity types in materials planning)

  − fixed value W (MRP: stock value display in the collective access graphic).

    In the standard SAP System, the authorization for displaying stock values is not activated.

- In the material master (*Accounting* view), you have defined a moving price or a standard price for the materials, for which you want to display stock values graphically.

Features

- Displaying the **Range of Coverage**

  The system displays the **actual range of coverage** that is calculated in the MRP list and stock/requirements list in the daily period totals display. As this calculation is only correct to the day, the system enters every value at the end of the day at midnight. The curve begins with the day of the first change involving stocks.

  The x-axis represents **time**. As standard, the system displays a period of 12 calendar weeks (84 days) starting from the current date. You can, however, select a user-defined period.

The y-axis represents the **actual range of coverage** in days. As standard, the system displays a period from +20 to -20 days. You can, however, select a user-defined period. Values from outside of the period selected are not displayed.

- Displaying the **Stock Value**

    The system displays the value that results from multiplying the sum of the **available quantity and the safety stock** by the **moving price** or the **standard price** from the material master. The available quantity is the quantity that is calculated in the MRP list and stock/requirements list in the daily period totals display. As this calculation is only correct to the day, the system enters every value at the end of the day at midnight.

    The stock values are given in the currency for the material that is selected first in the material list. If the values for the other materials are in different currencies, these are automatically converted into this currency.

    The x-axis represents **time**. As standard, the system displays a period of 12 calendar weeks (84 days) starting from the current date. You can, however, select a user-defined period.

    The y-axis represents the **value** of the material in the respective national currency. The scale of the y-axis is determined by the maximum value of the materials to be entered and cannot be changed.

- You need an appropriate **authorization** in order to **display stock values**.

- The graphical display of stock values only represents guide values and does not take into account that – depending on price conditions or contractual agreements – every goods movement can be valuated theoretically with another price.

The system can display **up to ten materials** simultaneously. You can define a user-specific setting for the number of materials that can be displayed. As standard, the system displays up to five materials simultaneously.

Graphical Display of Lists

1. In the material list, select a material or several materials.

2. Choose ▐▌.

> In the lower screen area, the system displays the graphic for the materials selected.

Function	How to call up function	What you should know
Switch to ranges of coverage graphic	▐▌ *Ranges of coverage*	
Switch to stock value graphic	▐▌ *Stock value*	You need an appropriate authorization in order to display stock values.
Define user settings	▣	You can define the number of materials that can be displayed simultaneously and the scope of values for the two axes (for the stock value graphic, only the scope of value for the time axis). These settings apply to both the range of coverage graphic and the stock value graphic. You save the user settings by choosing ▐. By choosing *Basic settings*, you return to the standard values. You also save the background color for the graphic. You can save different background colors for the range of coverage graphic and the stock value graphic.
Scroll forward to the graphic for the last group of materials	▶	You can define a user-specific setting for the number of materials that can be displayed simultaneously. As standard, the system displays up to five materials simultaneously. If you select 13 materials in the material list, the system groups these in the graphic thus: 1-5, 6-10, 11-13.
Scroll back to the graphic for the last group of materials	◀	
Refresh graphic	▣, ▐▌	If you select other materials in the material list and want to display them in a graphic, you do not need to close the current graphic, but can simply refresh it.

Make settings for graphic	Context menu (click on the graphic with right mouse button) or double click on the individual areas of the graphic	The graphic settings are user-specific. For example, you can adjust the colors, the line type, the line width and the axes. You can save only the background color using the dialog box for user settings. You can find further information on graphic settings in the SAP document Business Graphics [Ext.] unter *Business Graphics*. This documentation is only available in English.
Print graphic	🖨	
Close graphic	⊠	

Comparing MRP List and Stock/Requirements List

Use

The **MRP list** displays the **result of the last planning run**. Changes that have occurred between planning runs are ignored in the MRP list.

In contrast to this, the system displays all changes in stock, receipts and issues, which have **currently** occurred, in the **stock/requirements list**.

By using the MRP list and stock/requirements list comparison you can compare these two evaluations with each other. This means that you can compare the situation at the time of the last planning run with the current stock/requirements situation.

Prerequisites

You have accessed the MRP list or the stock/requirements list.

Procedure

- From the **MRP list**, choose *Goto → Stock/requirements list comparison*.

- From the **stock/requirement list**, choose *Goto → MRP list comparison*.

Result

You now branch into the comparison screen for both lists.

The system displays the date of the last planning run in the *Comparison* screen area.

In the *Period totals* screen area, the system shows the planning result in the period totals display. There are two of each column, that is, one for each list type. They can be told apart optically.

By choosing 🔧 *Stock/requirements list,* you branch into the period totals display of the stock/requirements list and by choosing 🔧 *MRP list*, you branch into the MRP list.

By double-clicking on a period, you call up the individual line display for the selected period in the lower part of the screen. The system lists all the MRP elements for this period individually.

Printing Individual Lists

Prerequisites

You are in the material list, the MRP list, or the stock/requirements list.

Procedure

Standard Print (Only in the Lists)

Choose 🖨 or the menu path *List → Print*, and enter the necessary print settings.

A standard version of the lists is printed. This standard version does not necessarily correspond to the settings that you have made for the screen.

Variable Print

1. Choose 🖨 (material list) or *List → Variable print* (individual lists).

   The system displays a printable and changeable list, which corresponds exactly to the settings that you have entered on the screen. In this list, you can sort and filter information, define column sequence and column width and, if required, save the settings in display variants. You can find further information on this under *ABAP List Viewer* in the introduction to the SAP System in the SAP Library.

2. Start printing from this list by choosing 🖨.

Printing Several MRP Lists

Printing Online

1. Starting from the MRP or MPS menu, select *Evaluations → Print MRP list*.

The selection screen for printing MRP lists appears.

2. Enter the required selection parameters (see Using Collective Access for MRP Lists [Page 164]).

3. Choose 🔄.

You now branch into the print parameters screen.

4. Enter the necessary print parameters.

5. Choose *Continue*.

The system creates the print request.

Printing in the Background

1. Starting from the SAP Easy Access menu, select *System → Services → Background job → Define job*.

The initial screen for defining background jobs appears.

2. In the *Job* field enter the program name **RMDLDR00**.

3. Enter a priority in the *Job class* field.

4. Choose 🔧 *Start condition*.

The *Start date values* screen appears.

5. Enter the required start date.

6. Save your entries on this screen.

7. Choose 🔧 Step.

You now branch into the *Create step 0* screen.

8. Choose *ABAP program*.

9. In the *Name* field enter the program name **RMDLDR00** again.

10. Choose a program variant in the *Variant* field by using F4.

The selection parameters for printing MRP lists are defined in the variant.

If no variant has been created, contact your system administrator.

11. Save your entries on this screen.

12. Choose *Job → Save* to save the whole job.

The system creates the background job.

Navigation Between Information

Use

There are numerous possibilities for displaying information for a material or for Customizing from the MRP list or stock/requirements list quickly and easily, for calling up other materials or branching into other transactions. You can thus set up your **work station around the MRP list or the stock/requirement list** so that all of your activities can be executed from there and you **do not have to leave the transaction**.

Prerequisites

You have called up the MRP list or the stock/requirements list for a material.

Procedure

Function	Starting the function	What you should know
Access to lists for the same material in different plants/MRP areas.	F4 possible entries help on the *Plant* or *MRP area* field	The system only proposes the plants or MRP areas in which the material is actually available. If the material is not available in any other plant, the fields are not ready for input. The material in the new plant or MRP area is directly added to the material tree.
Access to lists for other materials	Double-click on a material in the material tree or overwrite the material number in the list header and confirm with *Enter*	If necessary, the new material is added directly to the material tree.

Navigation Between Information

Display Customizing settings	Double-click on the fields	Double-click the *Lot size* entry field, for example, in the header details for the material, to branch directly to Customizing for lot sizes. The system displays the appropriate information, but you are not able to make any changes. You must have the corresponding authorization to display tables. Further entry fields that branch to Customizing are, for example, *MRP type, Coverage profile, MRP controller, Special procurement,* and *Strategy group*. The *Display horizon* and *selection rule* fields also branch to Customizing. You activate these by double-clicking on the field label itself after you have set a display horizon or selection rule. Fields that you can double-click are highlighted.
Display data from other applications (material master and so on)	Double-click on the fields	Double-click a material number to branch to the material master without exiting the transaction. Further fields from which you can branch to applications are, for example, *Vendor* (vendor master) and *Customer* (customer master). Fields that you can double-click are highlighted.
Use fixed branches to other transactions.	*Environment*	
Use fixed branches for a navigation profile	*Environment → Navigation profile → Assign*	You assign yourself a company-specific navigation profile that corresponds to your user role and provides you with a fixed record of general transaction calls and transaction calls per MRP element. You define navigation profiles in Customizing for MRP in the IMG activity *Define navigation profiles*.
Create user-specific branches to other transactions		See Define User-Specific General Transaction Calls [Page 209] and Define User-Specific Transaction Calls per MRP Element [Page 211]

User-Specific Configuration of the Lists

Use

You have numerous possibilities for **selecting and formatting the data** in the MRP list and the stock/requirements list. Working with the lists is thus **more flexible and simpler**, and system performance is enhanced.

Prerequisites

You have called up the MRP list or the stock/requirements list for a material.

Features

- Definition of settings to access the lists

    You define which settings are activated as standard when you access the MRP list and the stock/requirements list (material tree, header details, filter, company-specific navigation profile, period totals display, and so on) and select a filter, navigation profile, and period split, as required. You can save the settings (see Configuring Access to the Lists [Page 201]).

- Navigation between materials in the material tree

    – Double-click on a material in the material tree to directly access the list for the chosen material.

    – You can switch the material tree between the worklist tree, the order tree and the product group tree.

    – You select which information is displayed in the material tree, sort/group the materials displayed as you require, and save the settings (see Material Tree [Page 202], Select Fields in the Tree [Page 203], Sort/Group Fields in the Tree [Page 205]).

- Definition of user-specific transaction calls

    You enhance the company-specific navigation profiles, which are available to all users, by adding user-specific transaction calls for the transactions to which you want to branch from the lists. As with the company-specific navigation profiles, you can use general transaction calls, which means that they refer to the material, and specific transaction calls, which refer to individual MRP elements (see Flexible Transaction Calls [Page 208], Define User-Specific General Transaction Calls [Page 209], Define User-Specific Transaction Calls per MRP Element [Page 211]).

- Configuration of the columns in the lists

    You adapt the sequence and width of all the columns that are displayed as standard to your needs. You do this with the mouse and save the settings in display variants, using 🖼 in the upper part of the screen, on the right-hand side of the table. This does not include additional columns that the system only displays when they have contents. You can find further information on this under *Table Settings* in the introduction to the SAP System in the SAP Library.

- Saving selection parameters for the collective access to the MRP list

User-Specific Configuration of the Lists

In the collective access to the MRP list, you save the settings for selecting data and limiting the selection (see Using Collective Access for MRP Lists [Page 164]).

- Definition of traffic light values

  The system displays the material with particular traffic light values (red, yellow, green) in the material lists for the collective access and in the worklist tree. Red traffic lights next to certain materials indicate immediately that these materials are critical and urgently need to be processed. The traffic light display is controlled by ranges of coverage and exception groups. You change the standard settings for traffic light values according to your needs and save them (see Define Traffic Lights [Page 214]).

- Definition of print settings

  Before you print material lists and individual lists, the system displays a list, which you can print and edit. In this list, you sort and filter information, define column sequence and column width and save the settings in display variants. You can find further information on this under *ABAP List Viewer* in the introduction to the SAP System in the SAP Library.

Settings

Use

You have numerous possibilities to control the **selection and format of data** in the MRP list and the stock/requirements list so that your own work with the lists is supported to an optimum.

> You always want to work with a particular preselected filter, or you always want to display the header details for a material and the material tree.

Features

In the *Settings* dialog box, you are provided with the following settings on various tab pages:

- Display of *header details* for the material (see Working with List Header and Material Tree [Page 176])

- Display of the *material tree* (see Material Tree [Page 202])

- Sort for the *individual segments* (see Individual Line Display [Page 180])

- Activation of the *individual segments* (see Individual Line Display [Page 180])

- Display of *period totals* (see Display of Period Totals [Page 183])

    You define the activation of the period totals display and select a particular period value, which means *Days*, *Weeks* or *Months*. If you have made corresponding settings in Customizing, you can also select *Posting periods*, *Individual split* or *Planning calendar*. The period value that you select determines which tab page is preferred in the period totals display and is therefore displayed in the foreground.

    If you want to preset the period values *planning calendar* or *individual split*, certain standard settings in Customizing determine which planning calendar or which individual split is activated. You can overwrite these standard settings by selecting different values.

- Definition of *requirement/receipt date* (see Individual Line Display [Page 180])

- Activation of the *safety time* (see Individual Line Display [Page 180])

- Display of *total replenishment lead-time* (see Individual Line Display [Page 180])

- Activation and selection of *display filter* and *selection rule* (see Filtering Information [Page 174])

- Selection of the *unit of measure*

    You define that calculations in the lists are not based on the base unit of measure, but are based on the order unit or the unit of issue, for example. The setting refers to the first of the two possible units in which the receipts or requirements, and the quantity available, can be displayed.

    All materials for which this alternative unit of measure is maintained are then displayed with the selected unit. The system also uses this unit for calculations in the detail dialog boxes for the individual MRP elements.

- Selection of the *checking rule for the ATP display*

Settings

> You define by which validation rule the availability check (or the missing parts check in inventory management) is carried out (see also Availability Check According to ATP Logic [Ext.], Availability Check for Components in the Planned Order [Ext.]).
>
> If you select a checking rule here, it is copied to the initial screen for the availability overview. If you then choose the menu path *Environment → ATP quantities* and branch to the availability overview, the system skips the initial screen.

- Assignment of company-specific *navigation profiles* (see Flexible Transaction Calls [Page 208]).

Configuring Access to the Lists

Prerequisites

- You have called up the MRP list or the stock/requirements list for a material.

    The settings are valid for both types of list.

- You have defined the required settings in Customizing for MRP for:

    - screen sequence of the header details (IMG activity *Define screen sequence for header details*)

    - individual splits and planning calendar (IMG activity *Define individual period split for period totals*, *Define period display for period totals* and *Maintain planning calendar*)

    - display filter and selection rule (IMG activity *Define display filter* and *Define selection rule*)

    - Navigation profile (IMG activity *Define navigation profile*)

    - Checking rule (IMG activity *Define availability check for components*)

Procedure

1. Choose 🖼.

    The system displays the *Settings* dialog box.

    ⚠

    When you access the dialog box, it shows the settings activated in the selected list and not those that you saved last.

2. Select the required settings on the different tab pages.

3. If required, choose a display filter, selection rule, company-specific navigation profile, and period split using F4.

4. Choose ✔ to activate the settings for the current display, or 💾 to save them permanently.

    Choose *Basic settings* to always return to the standard settings provided by SAP.

Result

The settings are copied to the display and, if you have saved them, are activated every time you access the lists.

Material Tree

Use

The material tree is a **structure tree**, which you can display on the left-hand side of the MRP list and the stock/requirements list. The system includes certain materials in the material tree automatically:

- all the materials that you have selected in the material list during collective access to the MRP list or the stock/requirements list

- all the materials, for which you call up an MRP list or a stock/requirements list during a working session.

When you leave the transaction, the selection of materials is lost.

Features

You can switch the tree between:

- **worklist tree** (all materials that you have processed in the respective transaction calls, or all materials that you selected in the material list)

- **order tree** (all assemblies or components for a selected MRP element according to the order report)

- **product group tree** (all materials and sub-product groups of a product group, only for access to the lists via product group)

Double-click a material in the material tree to branch directly to the corresponding MRP or stock/requirements list.

Select Fields in the Tree

Use

You can define which **fields** are shown in the material tree and in which **sequence** they are arranged.

You can carry out the definition of the fields and their sequence, independently of each other, in the following applications:

- MRP list for operational planning

- MRP list for long-term planning

- Stock/requirements list for operational planning

- Stock/requirements list for long-term planning

Prerequisites

- You have called up the MRP list or the stock/requirements list for a material.

- You have displayed the material tree.

Procedure

4. Choose 📊.

    The system displays the *Define fields and sequence* dialog box.

5. Enter a sequence number next to each field that you want to be displayed in the tree.

    You want to display the *Processed MRP lists, Traffic light, Material, MRP area*, *Material description* fields in this sequence. Enter:

Processed MRP lists	1
Traffic light	2
Material	3
MRP area	4
Material description	5

    You want to change the defined sequence so that the traffic light is first. Enter the following change:

Traffic light	1

    The remaining fields are resorted automatically when you confirm the entry with *Enter*.

6. Choose *Copy settings* to activate the settings for the current display, or 💾 to save them permanently.

Select Fields in the Tree

Result

The system displays the selected fields in the defined sequence in the material tree.

> You can change the sequence of the fields in the current display by moving the relevant column header to a new position using the mouse.

Sort/Group Fields in the Tree

Use

You can define that the materials in the tree are **sorted**.

> You require the system to display materials with red traffic lights or materials for which you have not yet processed the MRP list at the top.

You can also define **grouping**.

> You want to display material with red traffic lights first and to group by traffic light values. You then have a hierarchy in which you can expand and collapse the substructure with the appropriate materials for each of the three traffic light values. The display in the tree is thus clearer and more flexible.

> You can carry out grouping and sorting of the fields independently of each other in the following applications:

- MRP list for operational planning
- MRP list for long-term planning
- Stock/requirements list for operational planning
- Stock/requirements list for long-term planning

Prerequisites

- You have called up the MRP list or the stock/requirements list for a material.
- You have displayed the material tree.
- You have defined which fields are displayed in the tree.

Procedure

7. Choose 🖨.

   The system displays the *Group/sort* dialog box.

8. Enter the sequence number by which you want to sort the materials in the material tree next to each field.

   > You want to sort the *Processed MRP lists, Traffic light, Material, MRP area* and *Material description* fields in this sequence. Enter:

Processed MRP lists	1
Traffic light	2

Sort/Group Fields in the Tree

Material	3
MRP area	4
Material description	5

You want to change the defined sequence so that the traffic light is first. Enter the following change:

Traffic light	1

The remaining fields are resorted automatically when you confirm the entry with *Enter*.

9. Select the *Descending* field if you want to sort in descending order.

A descending sort is only recommended for the following fields:

Traffic light

Materials with red traffic lights, which means those whose processing has priority, are displayed first (red is the highest value, green the lowest).

List created (only stock/requirements lists)

Materials for which a list has been created are displayed first (list created is the highest value, list not created is the lowest value).

Range of coverage

Materials with the highest days' supply, which means those with high stock levels, are displayed first (highest days' supply is the highest value, lowest days' supply the lowest).

Exception group

Materials with the most exception messages in this group are displayed first (the most exception messages per group is the highest value, the least exception messages the lowest).

10. Select the *Group* field when materials in the material tree that have the same value in a particular field, a red traffic light for example, are to be grouped and arranged in that order.

Group and sort are coactive. Fields that you want to group must be at the top of the sort.

You want to sort as follows:

Field	**Priority (sort)**
Planning plant	1
Material type	2
ABC indicator	3

You want to group by material type within the sort. For this sort, you can not set the group indicator for material type alone. You must either group additionally by

planning plant or change the sort so that the material type has the highest priority within the sort.

The correct setting is:

Field	Group	Priority (sort)
Planning plant	X	1
Material type	X	2
ABC indicator		3

or

Field	Group	Priority (sort)
Material type	X	1
Planning plant		2
ABC indicator		3

11. Choose *Execute sort* to activate the settings for the current display, or to save them permanently.

Result

The materials in the material tree are sorted and grouped by the selected fields.

Flexible Transaction Calls

Use

You can define your own **transaction calls** for the MRP list and stock/requirements list. These transactions are subsequently displayed in the **menu** or as **pushbuttons** with icons and texts, so that you can access them without leaving the list display.

Features

You can use two types of transaction calls:

- **General transaction calls**

- **Transaction calls per MRP element**

You can define an unlimited number of transaction calls. However, the **display** is **limited** to five general transaction calls and two transaction calls per MRP element. The system displays the first five or the first two transaction calls that are valid for the respective context.

> You can also assign yourself a company-specific navigation profile that corresponds to your user role, under the menu path *Environment → Navigation profile → Assign*. You then have direct access to a fixed record of general transaction calls and transaction calls per MRP element without having to define the branches yourself.
>
> You define navigation profiles in Customizing for MRP in the IMG activity *Define navigation profiles*.

Define General Transaction Calls

Use

General transaction calls are valid **for all materials**. Example: Display BOM, display planning file entries.

Prerequisites

You have called up the MRP list or the stock/requirements list for a material.

Procedure

1. Choose *Environment → Own favorites → Maintain*.

    The system displays an overview of all existing transaction calls.

2. Choose *New entries*.

3. Choose *Examples*.

    The system displays a list of popular transaction calls that are available in the standard SAP System. The examples are defined in Customizing in navigation profile SAP0000000.

4. Select the required transaction call.

    The predefined parameters for the selected transaction call are copied to the screen. The predefined parameters can include the menu text, icon, icon text, quick info text, predefined parameters for fields in the initial screen, restrictions, and the application area. The menu text is displayed in the menu, under *Environment*, and a pushbutton with the icon and the text is shown in the application toolbar.

    You can **test the new branch** by using the menu entry or the pushbutton.

5. Change the navigation number so that it matches your own numbering system.

    The navigation number controls which of the transaction calls that have been created are offered as a branch and in which sequence in the respective transaction.

    If there are more than five valid transaction calls for the material displayed, which means transaction calls for which the material corresponds to the defined conditions, the system displays the five with the lowest sequence number.

6. Save the transaction call.

Result

The transaction call is immediately available in the MRP list and the stock/requirements list. The defined menu text is displayed in the **menu**, under *Environment → Own favorites*. In addition, a **pushbutton** with an icon and text is displayed.

The link is only available when the material whose list is displayed corresponds to the defined conditions. Example: A link that is only valid for in-house produced materials (procurement type E) is not displayed for externally procured materials.

Define General Transaction Calls

You are not dependent on the examples provided. You can define new transaction calls according to your requirements.

Transaction Calls per MRP Element

Use

Transaction calls per MRP element are valid, for example, **for production orders only, or for purchase requisitions only**. Example of transaction call for purchase requirement: Release purchase requirement.

Prerequisites

- You have called up the MRP list or the stock/requirements list for a material.

- You have accessed the *Details* dialog box for an MRP element, by double-clicking on the MRP element.

Procedure

7. Choose ✳.

   The system displays an overview of all the transaction calls for this MRP element.

8. Choose *New entries*.

9. Choose *Examples*.

   The system displays a list of popular transaction calls that are available in the standard SAP System.

   Examples are available for the MRP elements purchase requisition, purchase order, production order, process order, sales order stock, and project stock.

10. Select the required transaction call.

    The system displays the predefined parameters for the selected transaction call (pushbutton text, icon, icon text, quick info text, predefined parameters for fields in the initial screen, restrictions, application area). A pushbutton with icon and text is displayed on the screen.

    You can use this pushbutton to **test the new link**.

11. Change the navigation number so that it matches your own numbering system.

    The navigation number controls which of the transaction calls that have been created are offered as a branch and in which sequence in the respective transaction.

    If there are more than two transaction calls for the MRP element in the defined application area (operational planning or long-term planning), the system displays the two with the lowest sequence numbers.

12. Save the transaction call.

Result

The transaction call is immediately available as a **pushbutton** in the detail dialog box for this MRP element.

Transaction Calls per MRP Element

You are not dependent on the examples provided. You can define new transaction calls according to your requirements.

Traffic Lights

Use

Materials are indicated with **red, yellow, and green traffic lights** in the material tree and in the material lists for the MRP list and for the stock/requirements list.

The traffic light values (red, yellow, green) indicate how urgently materials need to be processed. **Red traffic lights** immediately indicate that the appropriate materials are **critical** and urgently need to be processed.

Integration

The traffic light display is controlled by ranges of coverage and exception groups. As standard, a red traffic light is displayed when the days' supply, receipt days' supply 1, or receipt days' supply 2 are less than or equal to zero, or when an exception message for group 8 is displayed. You can change and save these settings on a user-specific basis under the menu path *Settings → Define traffic light*.

For more information on these ranges of coverage, see Days' Supply and Receipt Days' Supply [Ext.].

⚠️

Do not mistake traffic lights for the processing indicator!

Define Traffic Lights

Use

Use the exception groups to define under which **conditions** materials are indicated by red, yellow, or green traffic lights. Example: You want all materials, whose dates lie in the past, to be indicated by a red traffic light.

The definition of traffic lights applies to both types of list.

Prerequisites

- You have accessed the material list in collective access, or the MRP list or stock/requirements list for a material.

- In case of **individual lists**: you have displayed the material tree.

Procedure

1. Choose ●.

   The system displays the *Define traffic light* dialog box.

2. Enter the number of workdays for the parameters *Days' supply*, *1st receipt days' supply* and *2nd receipt days' supply*, and under which circumstances the materials are to be displayed with red, yellow, and green traffic lights.

   You want the traffic light to be red when the days' supply for a material is <= 0, yellow when the days' supply is > 0 and <= 10 days, and green when the days' supply is > 10 days.

   Enter:

	Red	Yellow	Green
Days' supply	0	10	999,9

3. Use the exception groups to define under which conditions materials are indicated by red, yellow, or green traffic lights.

   You want materials with exception messages in exception group 4 to be indicated by a yellow traffic light and materials with exception messages in exception group 5 to be indicated by a red traffic light.

   Choose:

	Red	Yellow	Green
Exception group 4		X	
Exception group 5	X		

4. Choose ✔ to activate the settings for the current display, or 🖫 to save them permanently.

Result

The system sets the traffic light for the material after taking the settings for all the ranges of coverage and all the exception groups into consideration.

A material with a days' supply of 12 days would be indicated by a green traffic light if the settings above were entered. However, if there was an exception in exception group 5 and exception group 5 was indicated by red, the material would be indicated by a red traffic light.

Procurement Proposal (PP-MRP-PP)

Implementation Options

The system creates procurement proposals automatically **during the planning run**. They specify when inward stock movement should be made and the quantity of stock that is expected.

Integration

To	you require the additional components
convert planned orders	Material Master (LO-MD-MM)
convert planned orders into production orders	*Production Orders* (PP-SFC), *Routing* (PP-BD-RTG)
convert planned orders into process orders	*Production Planning for Process Industries* (PP-PI)
convert purchase requisitions into purchase orders	*Purchasing* (MM-PUR)
execute capacity leveling	*Capacity Planning* (PP-CRP)

Features

The procurement proposals include:

- **planned orders** (for materials that are procured externally or produced in-house)

- **purchase requisitions** (for materials that are procured externally)

- **schedule lines** (for materials that are procured externally and for which a source list entry and a scheduling agreement already exist)

Planned orders and purchase requisitions are internal planned elements that can be changed, rescheduled or deleted at any time.

In contrast, delivery schedules are fixed receipt elements, which must be followed. They therefore only belong to the procurement proposals **in a broader sense** (see Determining the Procurement Proposal [Page 92]).

The creation indicators in the initial screen of the planning run determine which procurement proposals are created during the planning run (see Creation Indicator [Page 141]).

Planned Order

Definition

A planned order is sent to a plant and is an MRP request for the procurement of a particular material at a determined time. It specifies when the inward material movement should be made and the quantity of material that is expected.

A planned order has the following characteristics:

- It is a **procurement proposal in MRP** for requirements coverage, that is, an **internal planning element**. It is not binding and does not therefore trigger procurement directly, but serves for planning purposes.

- It can be **changed or deleted** at any time (exceptions: planned orders for direct production and for direct procurement).

- Whether a material will later be produced in-house or procured externally is left open.

- For materials produced in-house, it represents the pegged requirement for dependent requirements and can be used in the capacity calculation.

- For materials produced in-house, it specifies the basic dates for production.

> Planned orders are converted into **production orders** for in-house production and into **purchase requisitions** for external procurement. In contrast to planned orders, production orders and purchase requisitions are fixed receipt elements, which commit to the procurement.

Use

Automatic Creation of Planned Orders

During the planning run, the system automatically calculates the materials to be procured as well as the requirements quantity and date. The system then creates the corresponding planned order.

The system also explodes the BOM for materials that are produced in-house and uses the BOM components as material components for the planned order. The system creates a corresponding dependent requirement for these components. If the quantity or the date of the planned order changes or if the bill of material changes, the bill of material is re-exploded in the next planning run and the dependent requirements of the material components are adjusted accordingly.

> You can determine in Customizing for MRP in the IMG activity *Define consumption mode and period of adjustment* that no planned orders are to be created within a particular period of time for **planned independent requirements,** for which no firmed receipt elements or firmed procurement proposals exist. The system then creates planned orders **for customer requirements only**. You can determine this for each plant or for each MRP group.

Planned Order

Manual Creation of Planned Orders

You can also create planned orders manually. For this, you determine which material should be procured, the quantity of material to be procured, the date it should be available and whether it is to be procured externally or internally.

If you create or change a planned order manually, you can also explode the BOM manually and adjust the material components.

Structure

The planned order consists of

- order data (quantities, dates, account assignment, material data, procurement data and so on)

- component overview (see also Process Components in Planned Order [Ext.]).

Display Planned Order

Use

You can display planned orders using the **individual display** or using the **collective display**.

Procedure

Individual Display

1. Starting from the MRP node, choose *Planned order → Display → Individual display.*

    The initial screen for the individual display appears.

2. Enter the number of the corresponding planned order and choose 🗹.

    The detail screen for the planned order appears.

Collective Display

In the collective display, the system displays all of the planned orders corresponding to your selection criteria collectively, for example, all the planned orders of a particular MRP controller.

1. Starting from the MRP node, choose *Planned order → Display → Collective display.*

    The initial screen for the collective display appears.

    You can search for planned orders by MRP controller, material, production version, production line or WBS element.

    For example, the following is based on the option of searching for planned orders by MRP controller.

2. Select *MRP controller* and choose *Find.*

    The system displays a dialog box.

3. Enter the *Plant* and the *MRP controller*.

    If you want to narrow the selection down further, enter a date up until which planned orders are to be displayed.

4. Choose ✔.

    The system displays a list of all the planned orders that fulfill your selection criteria.

    From this list, you have various options for processing the planned orders:

Function	How to call up function	What you should know
Display planned order	👓	
Change planned order	✏	

Display Planned Order

Delete planned order	🗑	In a dialog box, you must confirm the deletion of the planned orders once again.
Display pegged requirements		For more information, see Pegged Requirements [Ext.].
Display order report		For more information, see Order Report [Ext.].
Sort list		Before pressing the button, position the cursor on the column that you wish to use to sort the list.
Convert planned order	Convert to production order, Convert to purchase requisition, Convert to process order	You can find further information on this under Conversion of Planned Orders [Page 224] and Converting Planned Orders into Purchase Requisitions [Page 226].

If you change or convert planned orders from this list, the system displays the planned order as firm (X in the *Firming* column).

Create Planned Order Manually

Use

As a rule, planned orders are generated automatically during a planning run. However, it may be necessary to create planned orders manually, for example, if you want to procure materials independently from requirements.

Procedure

1. Starting from the Material Requirements Planning node, choose *Planned order* → *Create.*

   The initial screen for creating a planned order now appears.

2. Enter a planned order profile.

   The planned order profile determines, amongst other things, the order type, the procurement type, and the special procurement type of the planned order.

3. If necessary, also enter the number of a planned order, from which you want to copy data.

   All data from this planned order is copied into the new planned order. You can overwrite this data.

4. Choose 🗸.

   The detail screen for the planned order appears.

   The system sets the *order type* and *special procurement type* automatically according to the planned order profile. You cannot change these fields.

5. Enter data as required.

   💡

   It is sufficient to enter just the *order finish date* or the *order start date.* The system then calculates the missing date automatically using the scheduling data.

6. Choose 🗸.

   The system calculates missing dates and enters them. If a goods receipt processing time has been entered in the material master record for this material, it is set as the default value in the *GR processing time* field. You can change this value or, if the field is blank, enter a value. This entry has no effect on the value in the material master.

   The planning plant is transferred automatically as the production plant.

   The following indicators are set as default values:

   – The planned order is automatically flagged as convertible in the *Conversion indicator* field. This enables the later conversion to a production order for in-house production, or to a purchase requisition for external procurement.

   – As you manually created the planned order, it is automatically flagged as firmed in the *Firming* screen area. Firmed planned orders are not changed by the system in a subsequent planning run.

7. If required, enter further parameters:

Create Planned Order Manually

- BOM explosion number

- *Production version*

    You can enter the production version directly in the *Production version* field. If you use the quota arrangement system, you can display which production version is to be used next according to the quota arrangement. To do this, select *Edit → Assign version*.

- *Sales order* or *WBS element, for planned orders* that are assigned to the sales order account or to the project account

    For this, choose the tab index *Assignment.*

8. Choose 🖥 *Components*.

    The component overview appears. The system explodes the BOM and copies the BOM items into the planned order as components automatically.

9. Bearbeiten Sie ggf. If necessary, process the components for the planned order (see Process Components in Planned Order [Ext.]).

10. Choose 🌀 and save the planned order.

Change Planned Order

Use

Changes to existing planned orders can be necessary, for example, if the planned order in question is firmed, but then receives a rescheduling proposal during the planning run.

Procedure

1. Starting from the Material Requirements Planning node, choose *Planned order → Change.*

    The initial screen for changing a planned order now appears.

2. Enter the number of the planned order to be changed and choose 🗸.

    The detail screen for changing a planned order now appears.

3. Make the changes necessary.

4. Save the changes.

    If you change a planned order, it is then regarded as firmed for the planning run, (as is a planned order that is created manually). Thus, it will not be changed automatically during subsequent planning runs.

Conversion of Planned Orders

Use

Planned orders as internal planning elements only serve for planning purposes and do not trigger any procurement themselves. The system only triggers procurement, once these are converted into **fixed receipt elements**.

Integration

You have two options for converting the planned orders:

- over the MRP menu

- over the MRP list or the stock/requirements list.

  If you double-click on a planned order in the respective list, a dialog box with details for the planned order and the different options for conversion appears.

Features

The planned orders are converted as follows:

Discrete manufacturing, external procurement	Planned order → **Purchase requisition**
	The purchase requisition is then converted into a **purchase order** by Purchasing. It is only a fixed receipt element, once it is converted into a purchase order.
	For more information, see Converting Planned Orders into Purchase Requisitions [Page 226].
Discrete manufacturing, in-house production	Planned order → **Production order**
	For more information, refer to *PP-Production Orders* under
	Planned Order Conversions [Ext.] Converting an Individual Planned Order [Ext.] Executing Collective Conversion of Planned Orders [Ext.] Partial Conversion of Planned Orders [Ext.] Partially Converting a Planned Order [Ext.]
Process manufacturing	Planned order → **Process order**
	For more information, refer to *PP-Production Planning-Process Industries* under
	Converting Planned Order Collectively [Ext.] Converting Planned Orders Individually [Ext.] Partially Converting Planned Orders [Ext.]

The following options are available:

- **Individual conversion** (single planned order, also as a partial conversion)

- **Collective conversion** (several planned orders simultaneously)

Converting Planned Orders into Purchase Requisitions

Use

If the start date of a planned order lies in the **opening period** (see Creation Indicator [Page 141]), you must arrange the **procurement**. For materials procured externally, you should convert the planned order into a purchase requisition.

> In exceptional cases, you can also **convert planned orders into purchase requisitions for materials produced in-house**. This is then useful if there are capacity bottlenecks and only part of the procurement quantity can be produced in-house and the rest must be procured using purchase orders. In this case, the material type must allow both in-house production and external procurement.

The following options are available:

- **Individual conversion** (individual planned order)

  You can convert the total planned order quantity or just part of it. **Partial conversion** is useful if the requirements situation has changed or you want to produce part of the planned order in-house.

- **Collective conversion** (several planned orders)

  Collective conversion is also possible as a background job.

All purchase requisitions that were created as described above are firmed automatically. They are no longer changed by the system in subsequent planning runs.

Procedure

Total Conversion or Partial Conversion of Individual Planned Order

1. Starting from the MRP node, choose *Planned order* → *Convert to purchase requisition* → *Individual conversion.*

   The initial screen for the individual conversion of planned orders now appears.

2. Enter the number of the planned order you would like to convert into a purchase requisition and choose .

   The detail screen for the individual conversion of planned orders now appears.

   The first part of the screen displays the data of the planned order and the second part of the screen shows the data of the purchase requisition. This data is partly drawn from the planned order and partly from the material master. If necessary, you can overwrite this data.

3. Enter data as required.

4. In the case of partial conversion only: in the *Converted quantity field* the system automatically proposes the planned order quantity. Overwrite this value with the quantity that is actually to be converted and transferred to the purchase requisition and choose *Enter.*

   The system displays the message *Planned order only partially converted*.

The *Planned order quantity* is automatically reduced to the remaining quantity. You can correct or delete the planned order quantity. If you delete the planned order quantity, the system automatically deletes the planned order during conversion.

5. Save your entries.

   The planned order is converted totally or partially into a production order.

Collective Conversion Online

1. Starting from the MRP node, choose *Planned order → Convert to purchase requisition → Collective conversion.*

   The initial screen for the collective conversion of planned orders now appears.

2. Enter the *MRP controller number* and the *plant.*

3. Limit the selection further, if necessary, using the opening date and the procurement type.

4. Choose 🗸.

   The system displays a list of all the planned orders that fulfill the selection criteria.

5. Select the required planned orders.

6. Choose *Convert online* or *Do not convert online.*

   With *Convert online*, the system displays the screen for individual conversion once again before the conversion for each planned order and gives you the opportunity to edit it.

   With *Do not convert online*, the system converts the planned orders selected directly into purchase requisitions.

   If necessary information is missing for creating a purchase requisition, the system interrupts the conversion procedure and displays the screen for individual conversion. You can then add the missing data here. If you choose *Enter*, the system continues with the conversion.

   💡

   To avoid the interruption of the conversion procedure, you can predefine default data for the purchase requisition. To do this, choose *Goto → Purchase requisition default data* and enter the required data. This data applies to all purchase requisitions created in the conversion.

Collective Conversion as a Background Job

Collective conversion as a background job is particularly useful, if you have set the planning run so that purchase requisitions are created directly within the opening period and planned orders are created outside of the opening period. These planned orders must be converted into purchase requisitions on time. You can do this using conversion as a background job.

1. Starting from the MRP node, choose *Planned order → Convert to purchase requisition → In background.*

   The display of available variants appears.

2. Choose 🗋 *Variants*, and enter your variants.

3. Enter the necessary attributes for the variants.

4. Schedule the variants.

Converting Planned Orders into Purchase Requisitions

The system converts the planned orders into purchase requisitions automatically on the dates entered.

Firming Procurement Proposals

Use

The system adapts the quantities and dates of procurement proposals that are created automatically in the planning run to suit the requirements situation if the situation has changed in the next planning run. If you want to prevent the system from adapting them automatically, you can firm the procurement proposals. Firmed procurement proposals are no longer changed by the planning run. They can **only be changed manually**.

You can firm all types of procurement proposals:

- planned orders

- purchase requisitions

- Delivery schedules (schedule lines).

> The system flags firmed procurement proposals with a star in the stock/requirements list and the MRP list.

Features

Firming by Manual Changes

Procurement proposals that have been created or changed manually are given a firming indicator automatically by the system. You can cancel the firming by deleting the firming indicator at any time. You can also set the firming indicator manually, without changing the procurement proposal.

Firming with the Planning Time Fence

Order proposals that lie within a defined planning time fence are firmed for the planning run if they are set to an **MRP type with the appropriate firming type**. The firming indicator is not set and they are only firm as long as they lie within the planning time fence.

For schedule lines in the planning time fence, you can **firm only the quantities that have already been transferred** and not the current quantities. Transferred schedule lines are schedule lines that have been sent to the vendor by telecommunications and have been confirmed.

Firming with the Manual Firming Date

The manual firming date lengthens, if necessary, the planning time fence up to the date entered. This has the advantage over the planning time fence that you can firm procurement proposals for materials with an **MRP type that contains no firming type**.

Display and Change the Firming Indicator

- **Planned orders and purchase requisitions**

    You can **display** the firming indicator for planned orders and purchase requisitions when you access the detail dialog box for a procurement proposal by double-clicking on the procurement proposal in the stock/requirements list or MRP list. You can **change** the

Firming Procurement Proposals

firming indicator by choosing 🖊 in the detail dialog box and accessing the screen for the respective procurement proposal.

- **Delivery schedules (schedule lines).**

    You can **display** the firming indicator for schedule lines by positioning the cursor on the schedule lines in the stock/requirements list or MRP list and choosing 🖊. The screen for the schedule lines appears. You cannot, however, change the firming indicator there. You can only **change** it from the planning result. To do this, double-click on the schedule lines in the planning result.

Planning Time Fence for Transmitted Schedule Lines Only

Use

You can define that only quantities that have already been sent using message transmission and not current quantities are firmed for schedule lines that move into the planning time fence.

Prerequisites

- In Customizing for MRP, you have set the appropriate indicator in the IMG activity *Indicator: Only firm transmitted schedule lines* for each MRP group.

- You have maintained a planning time fence (see Planning Time Fence [Ext.]).

Features

Only quantities that have already been transmitted are firmed.

Background

The schedule lines are transmitted to the vendors using messages in Purchasing for the quantity that is recorded in the stock/requirements list at the time of transmission.

According to normal firming logic, schedule lines that lie outside the planning time fence at the moment and whose quantity has been changed in the planning run due to a change in requirements are also firmed (for the changed quantity) as soon as they move into the planning time fence.

If the *Firm printed lines* indicator is set, the following applies for these schedule lines:

- If you have not yet confirmed the current quantity by sending it to the vendor using message transmission, the system does not firm the current quantity within the planning time fence but firms the quantity that was sent to the vendor **in the last message transmission**.

  - If the current quantity is higher than the one that was transmitted last time, the system firms the smaller quantity that has already been transmitted. For the shortage quantity, a further schedule line is created and displaced to the end of the planning time fence.

  - If the current quantity is less than the one that was transmitted last time, the system firms the greater quantity that has already been transmitted.

- If **no message** has been sent to the vendor at all, no schedule lines are firmed in the planning time fence and instead, they are **displaced to the end of the planning time fence**.

This ensures that no unchecked quantities are firmed and transmitted.

> The message transmission is a Purchasing function. It can be found in the Purchasing menu under, *Outline agreement* → *Scheduling agreement* → *Messages* → *Print/transmit*.

Planning Time Fence for Transmitted Schedule Lines Only

A schedule line for 100 pieces is transmitted to the vendor from the MRP controller in week 1. The schedule line is still outside of the planning time fence.

The quantity is reduced to 80 pieces in the planning run in week 2. The MRP controller does not transmit the change.

The schedule line moves into the planning time fence in week 3. As the *Firm printed lines* indicator is set, the system does not firm the changed quantity of 80 pieces, but the old and already transmitted quantity of 100 pieces.

Forecast Parameters

Overview

In order to carry out the forecast for a material, you must first of all maintain the forecast parameters for this material in the material master record.

In the following section, a description is given of,

- which Forecast Models [Page 235] are available

- how Model Selection [Page 237] is carried out

- how the system carries out Model Initialization [Page 242]

- how the system carries out an Ex-Post Forecast [Page 243]

- how the system carries out Parameter Optimization [Page 244]

- information on Maintaining Forecast Parameters [Page 245]

- information on Creating Historical Data [Page 251]

- information on Creating Forecast Values [Page 252]

- information on Carrying out the Forecast with Reference to Another Material [Page 253]

Forecast Models

When a series of consumption values is analysed, certain patterns can usually be detected. From these patterns it is then possible to differentiate between various forecast models:

- Constant
- Trend
- Seasonal
- Seasonal trend

Constant model

Trend model

Seasonal model

Seasonal trend model
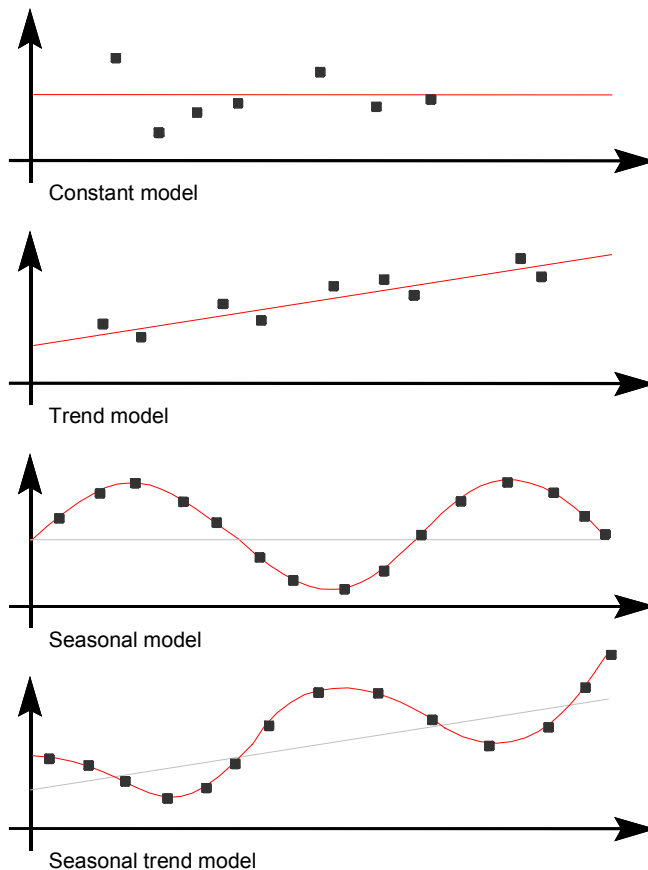
A constant consumption flow applies if consumption values vary very little from a stable mean value.

With a trend model, consumption values fall or rise constantly over a long period of time with only occasional deviations.

If periodically recurring peak or low values which differ significantly from a stable mean value are observed, it is a case of a seasonal consumption flow.

Forecast Models

A seasonal trend consumption model is characterized by a continual increase or decrease of the mean value.

If none of the above patterns can be detected in a series of past consumption values, then we have an irregular consumption flow.

Model Selection

Before the first forecast can be carried out, you must specify which forecast model the system is to use to calculate the forecast values.

There are three basic possibilities:

Manual

Forecast model

- ❑ Constant model
- ❑ Moving average
- ❑ Weighted moving average
- ❑ Trend model
- ❑ Seasonal model
- ❑ Seasonal trend model
- ❑ Copy historical values

Automatic

Model selection

- ❑ Check for trend model
- ❑ Check for seasonal model
- ❑ Check for seasonal trend model
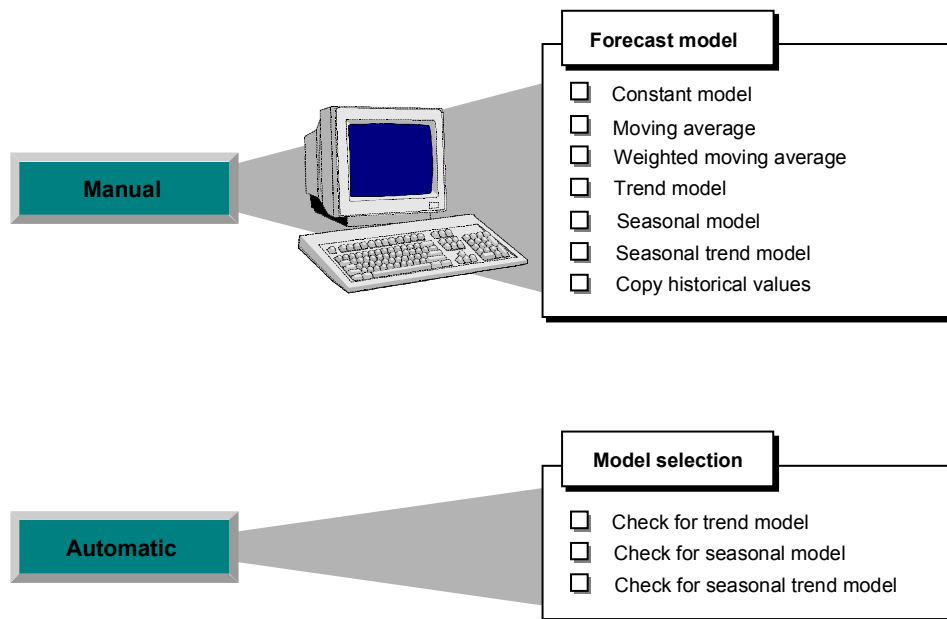
Manual Model Selection

If you want to select a model manually, then you must first of all analyse past consumption data to determine whether a distinct pattern or trend exists according to which you can manually select a model for the system.

Constant requirements pattern

If your past data represents a constant consumption flow, you can then select either the constant model or the constant model with adaption of the smoothing factors. In both cases, the forecast is carried out by first-order exponential smoothing. When adapting the smoothing parameters, the system calculates different parameter combinations and then selects the optimum parameter combination which is the one which results in the lowest mean absolute deviation.

You have another two possibilities if your past consumption pattern is constant; either the moving average model or the weighted moving average model.

In the weighted moving average model, you can weight individual past consumption values, which means that the system will not give equal value to past data when calculating the forecast values. In so doing, you can influence the calculation so that the most recent consumption values play a more important role in the forecast than the previous periods - as is also the case in exponential smoothing.

Trend requirements pattern

If your past consumption data represents a trend, it makes sense to select either the trend model or the second-order exponential smoothing model. In the trend model, the system calculates the forecast values by means of the first-order exponential smoothing procedure.

In the second-order exponential smoothing models, you can choose between a model with or without parameter optimization.

Seasonal requirements pattern

If your past consumption data represents a seasonal pattern, you can specify the seasonal model you want. The system calculates the forecast values for the seasonal model by means of first-order exponential smoothing.

Seasonal trend requirements pattern

If your past consumption data represents a seasonal trend pattern, you can select the seasonal trend model you want. The system calculates the forecast values by means of first-order exponential smoothing.

Irregular requirements pattern

None of the patterns or trends mentioned in the above examples can be recognized in an irregular consumption flow. If the system is to carry out a forecast for an irregular pattern, then it is usually advisable to select either the moving average model or the weighted moving average model.

Forecast Models for Different Requirements Patterns

Requirements pattern	Forecast model
Constant	constant model

	constant model with smoothing factor adaption
	moving average model
	weighted moving average model
Trend	trend model (first-order exponent smoothing)
Irregular	no forecast
	moving average model
	weighted moving average model
Extended forecasting component used:	
Trend	second-order exponential smoothing model (with and without parameter optimization)
Seasonal	seasonal model
Seasonal trend	seasonal trend model

Automatic Model Selection

If you do not want to specify a forecast model manually, you must instruct the system to make an automatic selection. The system then analyzes the historical data for different patterns and selects the appropriate model. The following models are possible:

- Constant model

- Trend model

- Seasonal model

- Seasonal trend model

If the system does not detect any regular pattern in the past consumption data, it automatically selects the constant model.

> The system requires a different amount of historical values for the individual tests. For more information on the exact number that it requires, see Model Initialization [Page 242].

Model Selection Procedures

If the system is to make an automatic model selection, you have the choice between two model selection procedures:

Procedure 1

The system carries out statistical tests and checks whether a trend or a seasonal requirements pattern applies.

In the trend test, the system subjects the historical values to a regression analysis and checks to see whether there is a significant trend pattern.

In the seasonal test, the system clears the historical values of any possible trends and carries out an autocorrelation test.

Procedure 2

The system calculates the models to be tested using various combinations for alpha, beta and gamma. The smoothing factors are also varied between 0.2 to 0.8 in intervals of 0.2.

The model which is then chosen is the the model which displays the lowest mean absolute deviation (MAD).

Procedure 2 is more precise than procedure 1 but takes considerably longer.

Manual Model Selection with Additional System Check

In the third case, you can have a combination of manual and automatic model selection: you specify a model and set the system so that it additionally checks historical values for a seasonal pattern or trend.

Possible combinations that you can choose are as follows:

1. You enter a trend model for the forecast model and then let the system check historical data for a seasonal pattern by setting the model selection to seasonal for the test.

2. You enter a seasonal model for the forecast model and then let the system check historical data for a trend by setting the model selection to trend for the test.

> A reference is given to the forecast formulae used by the system for the individual models in Forecast Formulae [Page 287].

Model Initialization

Model initialization is the process of specifying the necessary model parameters, such as the basic value, the trend value and the seasonal indices for the selected forecast model. In each case, initialization occurs during the first forecast for a material. It must also be carried out in cases of structural interruption, that is, if the existing forecast becomes invalid.

Which model parameters are necessary for which forecast model is shown in the following Table:

Model Parameters

Model	Model parameters
Constant model	basic value
Trend model	basic value, trend value
Seasonal model	basic value, seasonal indices
Seasonal trend model	basic value, trend value, seasonal indices

The forecast model is usually automatically initialized. In order to do this, the system requires a certain amount of historical values. The number required varies depending on the forecast model as shown in the table below.

Number of Historical Values Required for Model Initialization

Model	No. of historical values
Constant model	1
Trend model	3
Seasonal model	1 season
Seasonal trend model	1 season + 3
2nd-order exp. smoothing	3
Moving average	1
Weighted moving average	1

The system calculates the basic value on the basis of an average value, and the trend using the results of the regression analysis. The seasonal indices result from the quotient of the actual past value and the basic value which has been adjusted for the trend value.

These calculation methods are used for the constant, trend, seasonal and seasonal trend models, depending on which parameters are to be determined.

For the second-order exponential smoothing model, a regression analysis is carried out.

For the moving average and the weighted moving average models, the system calculates an average value.

Ex-Post Forecast

If more past values are available than the system requires or is to use for model initialization (refer to "Number of historical values" and "Initialization periods" in Forecast Parameters: Independent of the Forecast Model [Page 246]), then the system will carry out an ex-post forecast. In order to do this, the system divides the time series of past values into two groups. The first group with the older values is used for initialization. The system carries out an ex-post forecast using the second group as it is best to adapt the parameters to the most recent developments.
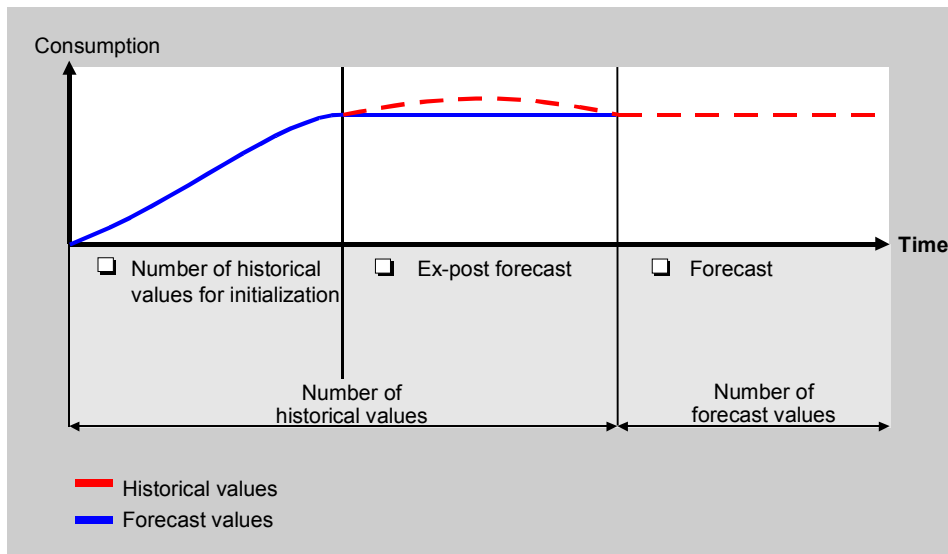
Furthermore, you can monitor the forecast model during the initialization phase by comparing the forecast values from the ex-post forecast with the actual consumption values.

> The ex-post forecast does not only play an important role in the initial forecast. It is also significant for subsequent forecasts. It is, therefore, possible to omit periods during the forecast calculation. This means that you can determine, for example, daily forecast values for a material even if you only execute a weekly forecast run for this particular material. The system forecasts the missing periods in retrospect. The ex-post forecast is only possible for models with the exponential smoothing procedure.

Parameter Optimization

For forecast models with exponential smoothing, you can instruct the system to optimize the smoothing factors (see Forecast Parameters: Dependent on the Forecast Model [Page 248]).

If the system is instructed to optimize the smoothing factors, it calculates several parameter combinations and then selects the combination with the lowest mean absolute deviation (MAD). The finer the degree of optimization, the more exact, but also the more time-consuming, the parameter optimization. You can vary the increment (also known as the degree of optimization) from 0.1 (low), 0.2 (medium) and 0.3 (high).

If you have set the system correctly, it will carry out parameter optimization during initialization for the initial forecast as well as for all other forecasts. The most effective combination of the smoothing factors is determined by means of the ex-post forecast.

Please refer to Appendix B in this manual for additional information on the calculation of the MAD as well as the significance of the smoothing factors.

> Optimizing the smoothing factor is only possible for models with the exponential smoothing procedure.

Maintaining Forecast Parameters

You maintain forecast parameters in the material master record. In order to do this, proceed as is described below:

1. Starting from the menu screen of the material master record, select *Material* → *Create* general.

2. Enter the material type, allocate it to an industry sector and press ENTER.

    The pop-up window Select View(s) appears on your screen.

3. Select the *Forecasting* view and press ENTER.

    The Organizational Levels/Profiles pop-up window now appears.

4. Because material requirements are forecast at plant level, you must enter the appropriate plant

5. Press ENTER.

    The "Forecasting" data screen now appears.

6. Fill in the data screen and save your entries via *Material* → *Save*.

A more detailed description is given of the individual forecast parameters in the follwoing sections:

Forecast Parameters: Independent of the Forecast Model [Page 246]

Forecast Parameters: Dependent on the Forecast Model [Page 248]

For more information on maintaining the material master record, please refer to *MM Managing Material Master Data*.

Forecast Parameters: Independent of the Forecast Model

You can/must maintain the following parameters independent of the method you use for model selection and which model you choose.

Period indicator

The period indicator determines the time interval the system is to use to store consumption or forecast values. You can define the period indicator when maintaining the MRP parameters as well as when maintaining the forecast parameters.

Fiscal year variant

You must maintain the fiscal year variant if you want a flexible period length for the material equal to that of the accounting period.

Historical values

You specify how many historical values the system should take into account for the forecast by filling in this field. The default value in this case is the maximum number possible (60). If fewer values are available, then they are used for initialization.

Initialization periods

You specify the number of periods the system is to use for model initialization here. If the number of historical values is greater than the number of initialization periods, then the system will carry out an ex-post forecast for those periods which were not used for initialization. The number of periods that the system requires for initialization depends on the forecast model.

Forecast periods

Via the number of forecast periods, you specify for how many periods the system determines forecast values.

Fixed periods

Via the number of fixed periods, you determine how many periods are fixed in the future and are no longer automatically changed by the next forecast run.

Initialization

This field activates re-initialization during the forecast. This is necessary for the first forecast and also when structural changes (that is, if the forecast model which has been used until now has lost its validity) appear in the time series.

Model initialization can either be carried out automatically (X) or manually (M). In the case of manual initialization (which should be the exception), you must determine the model parameters manually. To do this, select *Details* → *Forecast details* → *Model parameters*. Depending on the forecast model, you can manually maintain such parameters as the basic value and the trend in the pop-up window. If you do not set these parameters here, you will be requested to set them during the forecast. No historical data has to be stored in the system in order to carry out manual initialization.

Tracking limit

During the forecast calculation, the system compares the tracking limit with the quotient of the error total and the mean absolute deviation (MAD). This quotient is known as the tracking signal. If the value calculated by the system lies below that of the tracking limit, then the forecast

remains valid. If not, the system generates an exception message which indicates that a structural interruption has taken place. This means that the forecast model should be revised and possibly re-initialized.

Autom. reset

Causes the system to reset the forecast model automatically if the tracking limit is exceeded. Furthermore, the system carries out a new model selection during the next forecast.

Correction factors

If you fill in this field, historical values and forecast values are weighted with the appropriate period factors which you determined via customizing.

Reference material for consumption

If you define a reference material, the system accesses the historical data of the reference material up to the specified validity date. This makes sense, if no historical data exists yet for the specified material.

Reference plant for consumption

If you enter a reference material for consumption, you must also define a reference plant where the historical data to be used comes from.

Validity date

During the forecast, the system accesses the historical data of the reference material up to the specified validity date. From this date, it uses the material's own historical data.

Multiplier

By entering a multiplier, you can define that only a certain percentage of the consumption quantity of the reference material is used in the forecast.

Forecast Parameters: Dependent on the Forecast Model

You can/must maintain the following parameters depending on how you carry out model selection and which model you choose. The relationship between parameters and model selection is shown in the following two tables.

Parameters Dependent on Model Selection

Model selection	Parameters
Manual model	forecast model selection
Automatic	model selection, model selection procedure model selection

Parameters Dependent on the Forecast Model

Specified model/ model to be tested	Possible/required parameters
Constant model	parameter optimization
	optimization level
	alpha and delta factors
Constant model with optimization of the smoothing factors	-
Trend model	parameter optimization
	optimization level
	alpha, beta and delta factors
Moving average model	initialization periods
Weighted moving average	weighting group model
Extended forecast component used:	
Seasonal model	parameter optimization
	optimization level
	alpha, beta and delta factors
Seasonal trend model	parameter optimization
	optimization level
	alpha, beta, gamma and delta factors
2nd-order exponential smoothing model	parameter optimization
	alpha and delta factors

2nd-order exponential smoothing model with smoothing factor optimization	alpha and delta factors

Forecast model

You determine via the forecast model which model the system uses as a basis when calculating the forecast values. If you do not know the forecast model, you can have it determined by the system via automatic model selection.

Model selection

This indicator specifies for which model the system is to examine the historical values. You can specify whether the system searches the historical values

- for a constant pattern

- for a pattern corresponding to the trend model type

- for a seasonal pattern or

- for both a trend model pattern and a seasonal pattern.

Please note that depending on the model test, a minimum number of historical values must be available. This field is significant if you do not know the model and you want the system to determine it automatically. Furthermore, you also have the possibility of pre-selecting a trend model, but at the same time instruct the system to search for a seasonal pattern and vice versa.

Selection procedure

This indicator specifies how the system is to carry out the model selection. Here, you can choose between two procedures:

- The first procedure involves the system carrying out a significance test and then selecting the appropriate model.

- The second procedure involves the system determining the mean absolute deviation (MAD) using various parameter combinations for the models to be tested and then selecting the model which displays the lowest MAD. This procedure takes considerably longer than the first procedure.

Parameter optimization

Via this indicator, you can specify that the system is to optimize the necessary smoothing factors for the appropriate model. The system calculates several parameter combinations and selects the one that displays the lowest MAD. Parameter optimization is carried for the initial forecast as well as for the subsequent forecasts.

Periods per seasonal cycle

You must enter the number of periods that constitute a season here if you have selected a seasonal model or if the system is to carry out a seasonal test.

Optimization level

By determining the optimization level, you are specifying the increment with which the system is to carry out parameter optimization. The lower the increment, the more exact but also the more time consuming the optimization process will be.

Weighting group

Forecast Parameters: Dependent on the Forecast Model

You only have to maintain this field if you selected the forecast model, "weighted moving average". This key specifies how many historical values are taken into account for the forecast and how these values are weighted in the forecast calculation.

The following factors are used by the system, depending on the model, for exponential smoothing. Thus, for example, only the alpha and the delta factors are required for the constant model whereas all of the smoothing factors are required for the seasonal trend model.

Alpha factor

The system uses the alpha factor for smoothing the basic value. If you do not specify an alpha factor, the system will automatically use the alpha factor 0.2.

Beta factor

The system uses the beta factor for smoothing the trend value. If you do not specify a beta factor, the system will autimatically use the beta factor 0.1.

Gamma factor

The system uses the gamma factor for smoothing the seasonal index. If you do not specify a gamma factor, the system will automatically use the gamma factor 0.3.

Delta factor

The system uses the delta factor for smoothing the mean absolute deviation and the error total. If you do not specify a delta factor, the system will automatically use the delta factor 0.3.

> If you set parameter optimization, the system will overwrite the originally set smoothing factors with those which have been newly calculated by the optimization process.

Creating Historical Data

Historical data is generally updated in the material master record when stock is withdrawn from the warehouse. However, it is also possible to enter historical data manually, which then forms the basis of the initial forecast.

There are two types of historical data (consumption values) in the material master record: **total consumption** and **unplanned consumption** values.

Total consumption is the total of planned and unplanned consumption. For materials planned according to the consumption-based planning procedure, it is always the total consumption that is updated.

Unplanned consumption is only updated for materials that are planned according to MRP,

- if goods are withdrawn from the warehouse without a reservation

- if goods are withdrawn from the warehouse on the basis of a reservation, but if the quantity withdrawn exceeds the reservation

When withdrawing a material that is planned according to the MRP procedure on the basis of a reservation, only the planned consumption is updated. This value is not recorded in the material master record but, instead, it must be calculated by the user by subtracting unplanned consumption from total consumption.

This is how you enter consumption values manually:

1. In the Forecasting or Material Requirements Planning screen that you have already filled in, specify whether the consumption values are managed in days, weeks, or months by filling in the Period indicator field.

2. In the Forecasting screen, check the proposed values in the area Number of periods required, and change or add to them as necessary.

3. Select *Details* → *Consumption*.

   The consumption values entry screen appears.

4. Enter your consumption values, starting from the current period and working backwards.

   You can enter as many values as you want, both for total consumption and for unplanned consumption. Switch between the total consumption and unplanned consumption entry screens with *Edit* → *Unplanned consumption* or *Total consumption*.

   If you want to enter more values than there is room for on the first screen, press F23 to obtain further empty lines.

5. Store the data in the system with *Material* → *Save*.

   You can change the consumption values in any way required by your company using user exit EXIT_SAPMM61W_002.

Creating Forecast Values

Forecast values are generally calculated by the system as part of the forecasting process, and then updated in the material master record. However, it is possible to enter forecast values manually, which then form the basis of the planning run.

This is how you enter forecast values:

1. Once you have specified the required entries on the Forecasting data screen, define whether forecast values are managed in days, weeks, or months by filling in the *Period indicator* field.

2. Select *Details* → *Forecast details* → *Forecast values*.

   The forecast values entry screen appears.

3. Enter your forecast values.

   You can enter as many forecast values as you want. If you want to enter more values than there is room for on the screen, press F23 to obtain further empty lines.

4. Store the data in the system with *Material* → *Save*.

Importing External Forecasts

To import forecast values from a legacy system or another external system into the material master, use program RMPR1001. This program does not take account of MRP areas.

> If you import an externally created forecast, you must enter 'N' (*No forecast/external model*) as the forecast model on the forecasting screen of the material master record.

Carrying out the Forecast with Reference to Another Material

If no historical data exists for materials, which the system can access during the forecast, it is possible to use another material for the forecast. To do this, you must define a so-called reference material for consumption as well as a reference plant, a validity date, and a multiplier.

If you have defined a reference material, the system accesses the historical data of the reference material during the forecast up to the specified validity date. From the validity date, the system then uses the material's own historical data.

By entering a multiplier, you can define that only a certain percentage of the consumption quantity of the reference material is used for the forecast.

Maintaining Parameters Using Profiles

Overview

You can maintain MRP parameters and forecast parameters using profiles. A profile is a collection of information used to configure certain objects. It stores standard information that you need repeatedly in almost identical combinations when maintaining different objects. Thus, a profile simplifies data entry and data management.

In a profile you specify;

- which fields are filled with values when data on an object is entered,

- which values these fields contain and

- which of these values can be overwritten (default values) and which cannot be overwritten (fixed values).

In the material master, the objects are the material master records and the object data is the MRP or forecast data. There are two kinds of profile:

- MRP profile;

- forecast profile;

You can assign a profile to a material master record when you create it. This has the effect that **fixed values** that are copied from the profile into a data screen cannot be changed in the material master record. By contrast, you may overwrite **default values**. The values are written in the material master record when you save it.

In the following section, you will learn how to create, display, change, and delete profiles in the material master. MRP and forecast profiles are processed according to identical principles. Therefore the description given in this section applies to both profiles.

The following functions are available for profiles:

- Creating a Profile [Page 256]

- Displaying a Profile [Page 258]

- Changing a Profile [Page 259]

- Deleting a Profile [Page 260]

Creating a Profile

This is how you create a profile in the material master:

1. From the menu screen of the material master record, select *Profile* → *MRP profile* or *Forecast profile* → *Create*.

   The initial Create Profile screen appears.

2. Enter the key you want to assign to the profile.

   If you want to use an existing profile as a reference, enter the name of this profile in the Reference field so that the system can copy its values to the new profile.

3. Select *Goto* → *Selection screen*.

   The selection screen appears. It shows all the fields that can be copied to the MRP or forecasting screen of the material master record.

4. Enter a profile description and select the fields you want the profile to contain.

   You must also decide whether each field will be copied to the material master record as a fixed value or a default value.

5. Select *Goto* → *Data screen*.

   The data screen appears. Only the fields you marked on the selection screen are presented for you to fill in. The fixed and default values are displayed in different colors.

   All fixed values are required fields except where the field can also accept the value BLANK.

6. Enter your data and save the profile with *Profile* → *Save*.

   You now return to the initial screen where you can create another profile.

   The data for the MRP profiles are split over two data screens. With *Goto* → *Data screen 1* or *Data screen 2*, you can spring from one data screen to another.

The system runs a number of checks when you create a new profile:

- When you go from the selection screen to the data screen, the system checks whether the selected fields form a reasonable combination and are allowed to appear in the same profile.

   The Fixed lot size and Maximum stock level fields may not be combined in one MRP profile.

- When you save the data on the data screen, the system checks

   – whether the values you you have entered are valid, for example, whether they are defined in the appropriate table

   – whether the values you have entered are compatible with each other

If the Maximum stock level field appears in the profile, you must also specify a Lot size that can give the highest stock level.

If the system detects inconsistencies or errors, it asks you to change the fields selected on the selection screen and/or correct the values.

Displaying a Profile

This is how to display a profile in the material master:

1. From the menu screen of the material master, select *Profile* → *MRP profile* or *Forecast profile* → *Display*.

   The initial Display Profile screen appears.

2. Enter the name of the profile.

3. Select *Goto* → *Selection screen*.

   The selection screen appears. In display mode, only the fields that are defined in the profile are displayed.

4. Select *Goto* → *Data screen*.

   The data screen appears. You see the values that are defined in the profile.

   Press F3 to return to the initial screen and continue.

Changing a Profile

When you change a profile, the system not only updates the changed values in the profile; it also generates a background job which updates all material master records that have this profile assigned to them. However, this applies only to changes that affect fixed values. A changed document is created automatically for all materials where such changes have occurred.

Material master records are updated by the background job PROFILE. The system generates this job automatically when a profile has been changed and runs overnight. If errors occur due to data incompatibility, the details are recorded in a log. The next day, you can check the log to see which material master records were affected by these errors, and then edit them manually.

This is how you change a profile in the material master:

1. From the menu screen of the material master, Select *Profile* → *MRP profile* or *Forecast profile* → *Change*.

   The initial Change Profile screen appears.

2. Enter the name of the profile and select *Goto* → *Selection screen*.

   The selection screen appears. All the fields already included in the profile have a checkmark beside them.

3. Make the desired changes:

   – Select new fixed values or default values.

   – Change fixed values to default values or vice versa.

   – Reset check marks.

4. Select *Goto* → *Data screen*.

   The data screen appears.

5. Enter the changed values and save the profile with *Profile* → *Save*.

   You now return to the initial screen and can continue.

The same checks are run as when you create a profile (see Creating a Profile).

In addition, the system automatically generates the background job, PROFILE which is used to update the material master records. The background job is automatically started overnight. A background process is only created if you change several profiles on the same day.

If errors appear during the update due to data inconsistencies, then the system records these errors in a log. The next day, you use this log to identify the material master records for which an error was recorded, and you can then manually reprocess them.

If the background process shoud be terminated for any reason, then you have to request the update of the material master record manually by creating a background job for the program RMMM0001. You can use PROFILE again for the name of the background job or the job group; a variant is not required.

Deleting a Profile

The system also generates the background job PROFILE when you delete a profile. The job is started automatically in the evening. It cancels the profile in every material master record with that profile assigned to it; that is, the profile assignment disappears, but the values themselves remain stored in the material master record.

If errors occur while the job is being run, they are recorded in a log. The next day, you can check the log to see which material master records were affected by these errors, and then edit them manually.

This is how you delete a profile in the material master:

1. From the menu screen of the material master, select *Profile* → *MRP profile* or *Forecast profile* → *Delete*.

   The initial Delete Profile screen appears.

2. Enter the name of the profile you want to delete and press ENTER.

   A pop-up window appears.

3. Position the curser on Yes and press ENTER.

You now return to the initial screen and can continue.

Where-Used List for Profiles

Carrying Out the Forecast

Overview

This section provides a description of the article forecast in the SAP System. The following topics are covered:

- Things to Think About Before Carrying out the Forecast [Page 264]
- Forecast Options [Page 265]

You will also learn the various procedures that are carried out in the system during subsequent forecasts. This includes the following:

- Calculating the Forecast Values [Page 271]
- Calculating the Safety Stock and the Reorder Level [Page 272]
- Ex-Post Forecast [Page 273]
- Monitoring the Selected Forecast Model [Page 274]

During the first forecast run, the system also carries out the following procedures:

- Model Initialization [Page 242]
- How Does the System Optimize the Smoothing Factors [Page 275]
- Model Selection [Page 237]

Things to Think About Before Carrying out the Forecast

Before you can carry out the forecast for an article, the following prerequisites must be fulfilled:

- You must have maintained the forecast parameters in the article master.

- You must have determined the period for which the system is to carry out the forecast. You do this by defining the period indicator in the article master. For each article, the forecast can be carried out on either a daily, weekly, or monthly basis, or alternatively, according to accounting period.

- You must already have determined how the system is to select the forecast model. This can either be done manually by the RP controller or automatically by the system. In the case of automatic model selection, you must make sure that the required number of historical values are available; the number required varies depending on the forecast model selected.

- If no historical values were entered when creating the article master, you must carry out manual model initialization.

For a more detailed description of these prerequisites, see Overview [Page 234]

Before carrying out the forecast, you also have the possibility of revising an article's historical values which are normally automatically updated by the system during withdrawal postings. On the one hand, you can achieve this by doing one of the following;

- manually changing the values in the article master by means of the correction values

- correcting the weighting factor for the historical values in customizing - for the weighted moving average model.

On the other hand, you can reduce the number of periods to be taken into consideration by limiting the number of historical values in the article master. This means that not all of the historical values are used for the forecast, and instead, only the number of values that you enter.

If a structural interruption appears in the time series of past values stored in the article master record, and if for the next forecast you only want the system to take those values into account which lie after the interruption, then you do this by entering the appropriate number of past time periods in the Historical values field.

Consumption values not determined by the SAP System can be maintained directly with the following exception.

Consumption values for the period in which the article was created as well as in the previous period. These periods can only be influenced by consumption postings for the respective period.

Forecast Options

There are several possibilities available to you for carrying out the article forecast:

- You can carry out the **individual forecast**. This means that you carry out the forecast for a certain article in a certain site.

  Carrying Out the Individual Forecast [Page 266]

- You can carry out the **total forecast**. This means that you carry out the forecast for all articles of one particular site or for all sites.

  Carrying Out the Total Forecast [Page 268]

- To improve performance, it is advisable to carry out the total forecast in background mode.

  Carrying Out the Total Forecast in Background Mode [Page 270]

  You can also carry out the article forecast from the forecast screen of the customized article master. Depending on the forecast parameters maintained here, you can carry out the forecast in simulative mode in several online steps. The functionality used for this is that of the single-item forecast for an article.

  The forecast values are posted when you save the article master record. This also automatically adjusts the two RP parameters, the *reorder level* and the *safety stock level*.

Carrying Out the Individual Forecast

Carrying out the forecast for a particular article in a particular site is known as the individual forecast. You carry out an individual forecast as is described below:

1. From the menu screen of the forecast, select *Forecast* → *Individual forecast* → *Execute*.

   The initial Forecast screen appears.

2. Enter the article number and the site for which you want to carry out the forecast and press ENTER.

   The Parameter Overview screen now appears. This screen displays the following information:

   – the last forecast date

   – data, copied from the article master record

   – parameter values, which were calculated as a result of the previous forecast

   If no forecast has yet been carried out for this article, the Last forecast field is empty and the message *Until now no forecast values were saved* appears.

   From this screen you can display the historical values by selecting *Goto* → *Historical values* and if a forecast has already been carried out, you can display the forecast values by selecting *Goto* → *Forecast values*.

3. To carry out the forecast for the article, select Proceed.

   A pop-up window now appears where the date of the first day of the period is suggested.

   If you choose to overwrite the forecast date, please note that the date you enter must lie within the current or the following period.

4. Select ENTER.

   The forecast is carried out. The Forecast Values screen then appears and the following message appears:

   Forecast calculation was carried out.

5. Check the individual values.

   You now have the option of manually changing the forecast values calculated by the system by entering new values in the Corrected value column.

   The system then uses these new values as a basis for the future planning run.

6. Return to the Parameter Overview screen, and select, *Details* → *Addtl parameter*.

   A pop-up window appears with the additional parameters.

7. Select Cancel to return to the Parameter Overview screen. Here you can check the exception messages which were created during the forecast with *Details* → *Messages*

8. Return to the Parameter Overview screen and save the forecast values by selecting *Forecast* → *Save*.

If you manually change a forecast value, then you should check the actual consumption value that results for this period later and correct it, if necessary.

Carrying Out the Total Forecast

If you want to carry out the forecast for all the articles in one certain site or in all sites, then you must carry out a total forecast. A description of how to do this is given in the following paragraphs:

1. From the menu screen of the forecast, select *Forecast* → *Total forecast* → *Execute*.

   The initial Forecast screen appears for carrying out the total forecast.

2. Enter the required data:

   Site

   Enter the site for which the total forecast is to be started. If you do not enter a site here, the forecast is carried out for all sites.

   Period indicator

   This indicator specifies the time period for which the forecast values are managed in the system. The options given mean the following:

   M - Monthly

   W - Weekly

   T - Daily

   P - Period according to fiscal year variant

   All those articles which have the same period indicator in the article master record as the indicator you enter here are included in the forecast.

   Forecast execution

   Indicator A means that the forecast will be carried out for the current period and indicator F means that the forecast will be carried out for the following period.

   Save

   Select this field if you want the forecast result to be stored in the system.

   Log record

   If you select this field, a list is displayed after the forecast run of all the articles for which forecast values were created. The list also contains the process and exception messages.

3. To start the forecast run, press ENTER.

   The corresponding texts for the entries now appear and you are requested to check your entries.

4. Press ENTER.

   The following message will appear:

   Total forecast to be started. Please press ENTER.

5. Press ENTER again.

   When the forecast run is complete, you receive a list of all the articles which were included in the forecast if you filled in the *Log record* field. If not, then no list will appear.

The total forecast must be carried out periodically. The time intervals available are; monthly, weekly, daily, or per accounting period. If you carry out the forecast on a daily basis, then, for articles that are planned using time-phased planning, the system only includes the articles whose turn it is according to the RP date.

If past consumption values are known at the end of a period, the system will use them as a basis for carrying out the forecast for the next period.

Subsequently, the forecast results can be printed out. The print program prints the forecast results which have automatically been sorted according to company code, site, RP controller and highest error number. For more information on this subject, see Overview [Page 277].

Carrying Out the Total Forecast in Background Mode

To start the total forecast in background mode, from the menu screen of the forecast, select *Forecast* → *Total forecast* → *Execute (background)*.

The initial screen for Background Request appears.

Here, you can either start the forecast run immediately or you can plan it to start at a later date by means of a selection variant. The forecast is then carried out in background mode. More detailed information on background request procedures can be found in the SAP document *ABAP/4: Generating and Printing Reports*.

> A repeat forecast (that is, the forecast is carried out again for a certain period) is not possible for the total forecast either in online or in background mode.

Calculating the Forecast Values

The forecast calculates the forecast values by using various mathematical formulae which evaluate historical data. The accuracy of the forecast basically depends on the extent and quality of the data that is available.

You only enter historical values when you create a new article master record or when the system creates a new article master record via batch input. The system then generates these values using withdrawal postings.

The system recalculates the basic value and the trend value for each forecast by using the smoothing factors and the most recent consumption values. The smoothing factors are the weighting factors used for historical data, with the values from the most recent period playing a more important role in the forecast than the values from previous periods.   The greater the smoothing factors you select in the article master, the faster the forecast values are adapted to the actual past consumption values.

For more details on the forecast formulae see

If your system is set so that the forecast values are to be taken into account for a planning run, then a so-called planning file entry is automatically made by creating a forecast requirement independent of the forecast result. In turn, this planning file entry initiates a new planning run for the articles affected.

For articles planned by reorder point planning, however, a requirements planning run is only initiated if the new reorder level, recalculated during the forecast, differs from the old level.

Calculating the Safety Stock and the Reorder Level

If a warehouse that stores article has to be ready for delivery at all times, then there has to be a high level of **safety stock** in this warehouse, as forecasting error cannot always be ruled out. This would also entail a high level of warehousing costs. The level of safety stock depends on the service level you select, on the replenishment lead time and on the accuracy of the forecast.

In order to keep the safety stock and therefore the storage costs as low as possible, the RP controller usually specifies a **service level** for each article. From a mathematical point of view, the service level represents an organization's ability to avoid a shortfall occurring during replenishment lead time.

If you opt for a relatively high service level, then the safety stock level calculated by the system will also be high. If you opt for a low service level, then the safety stock level will also be low.

The **replenishment lead time** refers to the in-house production time for in-house production and the planned delivery time for external procurement. It represents the time between the initiation of a procurement procedure and transferring the article into the warehouse. The replenishment lead time is stored at site level in the article master record by the RP controller. Since the probability of a shortfall is higher in a longer period, the safety stock level must also be set higher for long replenishment lead times.

Finally, the safety stock level also depends on the **accuracy of the forecast**. If the forecast deviates greatly from the actual consumption values, then the safety stock level will also be unusually high.

In addition to the safety stock level, the system recalculates the **reorder level** for articles which are subject to automatic reorder level adjustment. The reorder level is the sum of the safety stock and the forecast requirement within the replenishment lead time or the overall lead time for articles produced in-house.

The system compares "static" availability during article withdrawal; that is current availability, without taking future requirements into consideration, with the reorder level. In other words, it compares the remaining stock with the reorder level. If remaining stock falls below the reorder level, then the system marks the article for the planning run by making an entry in the planning file. During the next planning run, the system automatically generates a purchase requisition or a planned order for the article.

> You can find a list of the various formulae for calculating the safety stock level and the reorder level in Overview [Page 288]

Ex-Post Forecast

The system carries out an ex-post forecast for the initial forecast if more past values are available than are required/are to be used for initialization. It also carries out the ex-post forecast during parameter optimization, model initialization and for evaluating the accuracy of the forecast.

The system only carries out the ex-post forecast for subsequent forecasts when there is a gap of more than one forecast period between the last forecast date and the current forecast date. For technical reasons, the series of forecast values must be recalculated for every period. Since this requires a lot of time and effort for articles which are forecast daily or weekly, you can now make up for periods which you have "omitted" from the forecast. This means that it is no longer necessary to carry out the forecast for each period as the missing values can be provided by a later forecast. This is then achieved with the help of the ex-post forecast.

Monitoring the Selected Forecast Model

In the course of time, the characteristics of a consumption series can change. In order to be able to react to this in time, the system calculates a so-called **tracking signal** during every forecast. The tracking signal links the error total (FS) and the mean absolute devialtion (MAD) in the following manner:

Tracking signal = │ FS/MAD │

The forecast error is the difference between actual consumption values and the forecast values from the same period whereas the error total is the sum of all the forecast errors in a consumption series.

The error total is used to check the validity of the forecast model in operation.

If a model is still valid, that is, if the consumption series has not changed, then you can assume that the error total is distributed normally and has an average of zero.

If the consumption pattern has changed, however, the error total will no longer be equal to zero. You must standardize the calculated forecast error in order to set boundaries. Therefore, in addition to the error total, the system also calculates the mean absolute deviation (MAD) as a second value. The system then adds the errors (irrespective of the plus or minus sign) and divides them by the number of consumption values. The first-order exponential smoothing procedure is used to calculate the MAD. The smoothing factor used for this is the delta factor.

Using the quotient from the error total and the MAD, the system can now define a warning limit, the tracking signal which it then compares with the tracking limit specified in the article master. When the tracking signal is greater than the tracking limit, the RP controller receives a message stating that the forecast model should be checked.

After a model change or a forecast model initialization, the error total is automatically reset to zero and the MAD to its initial value.

The system automatically sets the tracking limit (the default value is 4.00). You can change it, however, when maintaining the article master record.

How Does the System Optimize the Smoothing Factors

The process of the ex-post forecast described above is used for parameter optimization in order to optimize the smoothing factors. In the article master, you can store whether parameter optimization is to take place during the forecast and if it is to take place, the degree of optimization you want to select.

When a forecast is carried out with parameter optimization, the system will start from an initial value and then gradually increase the increment of the smoothing factors in every simulation run. (This constitutes the first stage of the ex-post forecast.) The increment in this case is specified in the article master record by the optimization level. The system then further analyzes the situation for the parameter combination with the smallest MAD (second stage). The optimum parameter combination is the combination which has the lowest possible MAD.

Forecast Result

Overview

After a forecast run, the results must be checked over to make sure that the forecast was carried out correctly. There are two ways of doing this:

- Checking the Forecast Result Using a List [Page 278]

    You can print a list of the materials which were included in the forecast via a print program and then you can use this list to check the results.

- Checking the Forecast Result in Online Mode [Page 279]

    Alternatively, you can check for incorrect forecast results online.

    You will also receive information on Changing the Forecast Result [Page 281].

Checking the Forecast Result Using a List

In order to print out a list of materials from a certain plant which were included in a forecast run and which you want to use for checking the forecast results, follow the procedures described below:

1. Starting from the menu screen of the forecast, select *Forecast* → *Total forecast* → *Print*.

   The initial screen for Material Forecast Printing appears.

2. Enter the plant, for which you want to print out the forecast result, as well as a period indicator if you want to limit the selection to a certain time interval.

   If you also want a printout of the process and exception messages which were created during the forecast, select the Log field.

3. Press ENTER.

   The Print Parameters screen now appears.

4. Specify the print parameters, for example, the printer on which the list is to be printed, and then select the *Print* button.

   For more detailed information on printing procedures, see *Getting Started With the R/3 System*.

   After the system has created the list of all the material forecasts, the screen with the list of results appears and you can see exactly how many material forecasts the printed list contains.

Printing the list in background mode

If the forecast was carried out in background mode, it is also possible to print out the list in background mode. You do this as is described below:

1. Starting from the menu screen of the forecast select *Forecast* → *Total forecast* → *Print (background)*.

   The Background Request screen appears.

2. Using a background request means that you can plan the print for a later date and you can start it for a certain variant.

   You can read more about background request procedures in *ABAP/4: Generating and Printing Reports.*

Checking the Forecast Result in Online Mode

Errors or exceptional situations which appear during the total forecast are recorded in the exception messages and are allocated to a certain error class. If an error occurs in a material forecast, then the system marks the material for which the error occurs for reprocessing.

If you want to check the forecast result in online mode and reprocess the marked materials, proceed as follows:

1. Starting from the menu screen of the forecast, select *Forecast* → Total *forecast* → Reprocess.

   The initial screen for Forecast Reprocessing appears.

2. Enter the plant and the MRP controller number.

   If you want to limit the selection to a certain interval, you must enter the appropriate period indicator.

   Furthermore, you can limit the selection of exception messages to one particular error class by selecting various error classes. The following Table shows which types of exception messages exist and to which error class they are allocated.

Description of error classes

Exception message	Error class
Reorder level and safety stock	1
Model selection and test	2
Initialization	3
Parameter optimization	4
Difficulties during the forecast	5
Forecast not calculated	6
Missing table entries	7
Terminations	8

3. Press ENTER.

   A list of materials now appears displaying those materials for which one or more forecast errors occurred and which correspond to your selection.

4. Position the cursor on one of the materials and select, Choose.

   The Parameter Overview for the selected material now appears.

5. To display the exception message, select *Details* → *Messages*.

   A screen with the corresponding exception message appears. You can now see what caused the error during the forecast.

   Example:

Checking the Forecast Result in Online Mode

The MRP controller did not enter any historical values when creating the material master record. You must now respond to this situation with manual initialization.

a) Change the material master record by setting the initialization indicator to **m**.

b) Then, select the material to be reprocessed from the reprocessing list and branch into the Forecast Parameter screen.

c) Carry out an individual forecast for the material. A pop-up window appears, in which you can maintain the parameters corresponding to the forecast model.

d) Press ENTER.

    The system carries out the forecast and displays the forecast value with the message:

    Forecast calculation was carried out.

e) Check the forecast values and then save the result via *Forecast* → *Save*. The system returns to the overview screen and displays the message:

    The forecast values were saved.

By saving the new forecast result, the system then records that the material in question has been reprocessed and this material will automatically be deleted from the list of materials to be reprocessed.

Changing the Forecast Result

You cannot directly change the forecast values which were calculated by the system. You can only do this by means of a corrected value. This is necessary in the following cases:

- if less will be produced than was forecast, due to forthcoming company holidays

- if higher consumption is expected than was forecast due to a forthcoming advertising campaign

To change the forecast values, follow the steps as described below:

1. Either start from the menu screen of the forecast:

    Select Individual *forecast* → *Change*, then enter the material number and the plant and press ENTER. The Parameter Overview screen now appears.

    Alternatively, you can start from the reprocessing list:

    In this case, you select the material you want by selecting, Choose. In this way you also arrive at the Parameter Overview screen.

2. To call up the forecast values calculated by the system, select *Goto* → *Forecast* values.

    The Forecast Values screen then appears.

3. You make the changes to the forecast values calculated by the system here. To do this, you enter the corrected values in the Corrected value field for each period which the system is then to use in a future planning run .

    After you press ENTER, the system sets an indicator in the Fx field which specifies that the forecast values are fixed and will no longer be automatically changed during subsequent forecast runs.

    If you want to fix the forecast values without entering corrected values, then you must manually select the Fx column. Once again, the values will no longer be changed during subsequent forecast runs.

4. Save the changed values with *Forecast* → *Save*.

    It is also possible to store correction factors for different periods in Customizing. The system uses these correction factors to weight the forecast values as well as the past consumption values.

Significance of the Material Forecast for Materials Planning

Overview [Page 283]

Reducing Forecast Requirements [Page 284]

Effects on Consumption-Based Planning Procedures [Page 285]

Splitting the Forecast Requirements [Page 286]

Material Forecast

The results of the material forecast are frequently used as a basis for SOP. In MRP, the forecast values calculated during the forecast run result in purchase requisitions or in planned orders and they can also be used for determining safety stock and reorder levels.

Reducing Forecast Requirements

Forecast requirement values created during the forecast run are displayed on the time axis as issues:

- When calculating the current stock/requirements situation (displayed in the stock/requirements list), the system reduces the current period's forecast requirements by the consumption figures from the same period which have already been posted.

- The same procedure is also used for calculating material requirements, that is, the system successively consumes forecast requirements with withdrawal postings.

> In MRP, the reduction of forecast requirements only differs in two aspects:
>
> - the results of the forecast are available for planning as forecast requirements for **unplanned consumption**.
>
> - forecast requirements are reduced by **unplanned consumption** from the same period which has already been posted.

The results of the forecast are transferred to material requirements planning as forecast requirements and are displayed on the time axis. In the following example, the reduction of forecast requirement quantities is shown by consumption.

Reduction of forecast requirement quantities

	Forecast reqmt	Available for plng	Withdr. posting	Reduction	After reduction
Period 1	1000	1000	**400**	400	**600**
Period 2	1000	1000	0	0	1000
Period 1	1000	1000	**1200**	1000	**0**
Period 2	1000	1000	0	**200**	**800**

Goods issue results in a withdrawal posting and reduces the current period's forecast requirement by the amount withdrawn. If the goods issue was higher than the corresponding forecast requirement, the remaining amount is subtracted from the following period's forecast requirement.

In this example, a goods issue of 400 pieces was posted in the first period. As a result, the forecast requirement of 1000 pieces was reduced by 400 pieces. In the first period, 600 pieces are still available for planning.

If consumption (that is, the goods issue) (1200) in the first period is higher than the original forecast requirement (1000) then the forecast requirement for the following period (1000) is reduced by the remaining amount (1200 - 1000 = 200). That means that in the first period, 0 pieces are still available for planning and in the second period, 800 pieces.

Effects on Consumption-Based Planning Procedures

A forecast run has different effects on the different MRP procedures which support the forecast:

- In the automatic reorder point planning procedure, the reorder level and the safety stock are automatically determined during the forecast run.

- In forecast-based planning, the results of the forecast are copied into material requirements planning as forecast requirements and the safety stock level is calculated.

In both of the above cases, the statistical total consumption fields of the material master data is the basis for forecasting. You can find more precise information on this subject in Overview [Page 288].

Splitting the Forecast Requirements

For material requirements planning, it is possible to split the period requirements into smaller periods. For example, monthly forecast values can be split into weekly or daily quantities.

You set the splitting indicators in the material master record in the *Splitting indicator* field.

If you have selected a daily split, the system distributes the forecast requirement, which has been reduced by the actual consumption values, over the remaining workdays in the month.

The requirements split is identical for both the consumption-based planning procedure and the MRP procedure.
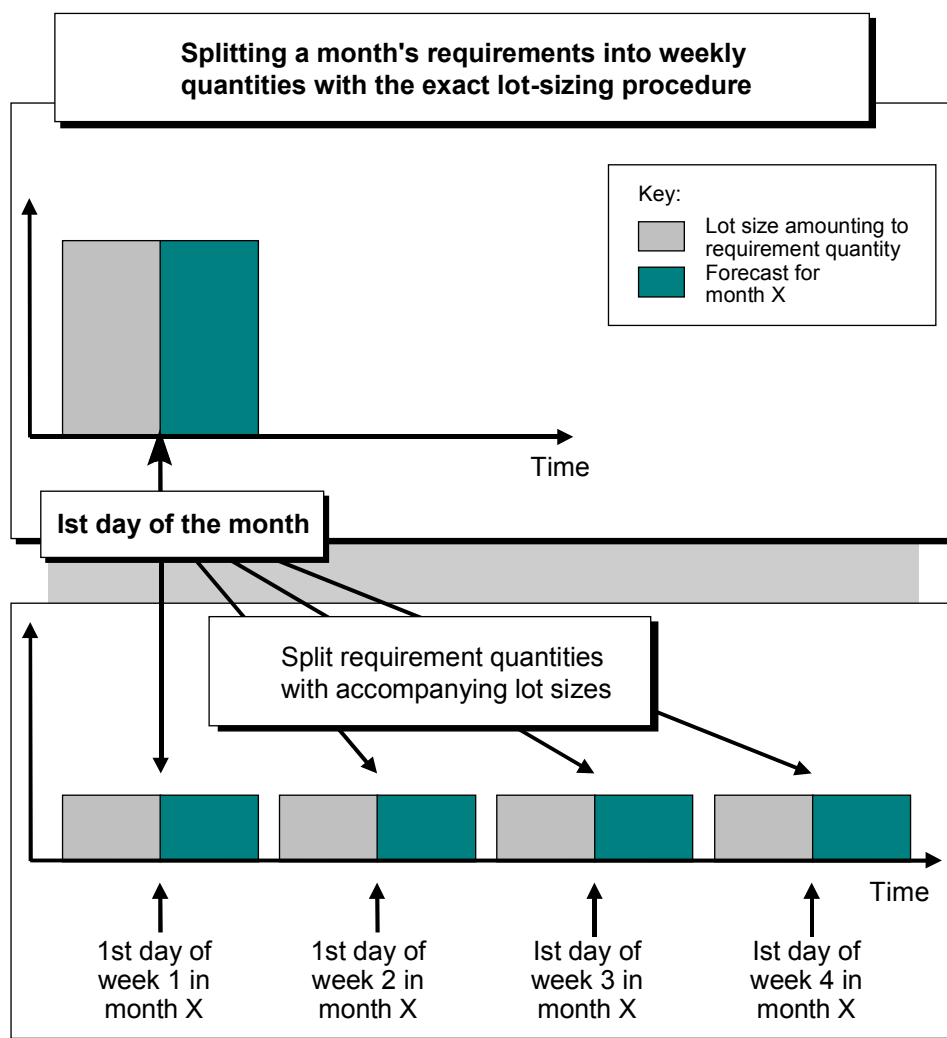
Forecast Formulas

Overview

In this section, a description is given of the formulae which form the basis of the forecast. The following formulae are displayed in detail:

- formula for the forecast models

- formula for the evaluation of the forecast

- formula for calculating the reorder level and safety stock

Moving Average Model

The moving average model is used to exclude irregularities in the time series pattern. The model calculates the average of the n last time series values. The average can always be calculated from n values according to formula (1).

$$(1) \qquad M(t) \;=\; \frac{V(t) \;+\; V(t-1) \;+\; \ldots \;+\; V(t-n+1)}{n}$$

$$(2) \qquad M(t+1) \;=\; M(t) \;+\; \frac{V(t+1) \;-\; V(t-n+1)}{n}$$

Therefore, the new average is calculated from the previous average and the current consumption value weighted with 1/n, minus the oldest consumption value weighted with 1/n.

This procedure is suitable for time series which are constant; that is, for time series with no trend-like or season-like patterns. As all historical data is equally weighted with the factor 1/n, it takes precisely n periods for the forecast to adapt to a possible level change.

Weighted Moving Average Model

You achieve better results than those received from the moving average model by introducing weighting factors for each past value. This means that every past value is weighted with the factor R. The sum of the weighting factors is 1 (see formulas (3) and (4) below).

$$(3) \quad M(t) \quad = \frac{V(t)}{n} + \frac{V(t-1)}{n} + \ldots + \frac{V(t-n+1)}{n}$$

$$(4) \quad M(t) \quad = \quad R(t) * V(t) \quad + \quad R(t-1) * V(t-1) + \ldots + R(t-n+1) * V(t-1)$$

M = Average

V = Actual value

R = Weighting factor

If the time series to be forecast contains trend-like variations you will receive better results by using the weighted moving average model rather than the moving average model. The reason for this is that more weight is given to more recent data when determining the average than to older data, that is, if you selected appropriate weighting factors. Therefore, the system will be able to react more quickly to a change in level.

This model, however, depends strongly on your choice of weighting factors. If the time series pattern changes, you must also adapt the weighting factors.

Principles of First-Order Exponential Smoothing

The principles of first-order exponential smoothing are:

- The older the time series values, the less important they become for the calculation of the forecast.

- The present forecast error is taken into account for the following forecasts.

Constant Model with First-Order Exponential Smoothing

The constant model with first-order exponential smoothing is derived as in formula (5). A simple transformation gives the basic formula for exponential smoothing as shown in (6).

$$(5) \quad G(t) \quad = \quad G(t-1) + \alpha \, (V(t) - G(t-1))$$

$$(6) \quad G(t) \quad = \quad \alpha V(t) + (1 - \alpha) \, G(t-1)$$

G(t)	**=**	**The current basic value for the current period (t)**
G(t-1)	**=**	**The previous basic value from the previous period**
V(t)	**=**	**Actual demand for the current period (t)**
α	**=**	**Smoothing factor for the basic value**

To determine the forecast value, you only require the preceding forecast value, the last past consumption value and the alpha smoothing factor. The smoothing factor weights the most recent consumption values more than the less recent ones, so that they have a stronger influence on the forecast.

How quickly the forecast reacts to a change in consumption pattern depends on what value you give the smoothing factor. If you set alpha to be 0, the new average is equal to the old one and the basic value calculated previously remains; that is, the forecast does not react to current consumption data. If you give alpha the value 1, the new average equals the last consumption value.

The most common values for alpha lie between 0.1 and 0.5. An alpha value of 0.5 weights past consumption values as follows:

1st historical value : 50%

2nd historical value : 25%

3rd historical value : 12.5%

4th historical value : 6.25%

and so on.

The weightings of past consumption data can be changed by one single parameter. Therefore, it is relatively easy to respond to changes in the time series.

The constant model of first-order exponential smoothing derived above is applicable to time series that do not have trend-like patterns or seasonal-like variations.

Trend and Seasonal Models with First-Order Exponential Smoothing

From the basic formula derived in (6), the general formula for first-order exponential smoothing (7) takes into account both trend and seasonal variations. The basic value, the trend value and the seasonal index are calculated as shown in formulas (8) - (10).

Forecast value for the period (t+i)

(7) $P(t+i) = (G(t) + i * T(t)) * S(t-L+i)$

where:

Basic value:

(8) $G(t) = G(t-1) + T(t-1) + \alpha \left[\dfrac{V(t)}{S(t)} - G(t-1) - T(t-1) \right]$

Trend value:

(9) $T(t) = T(t-1) + \beta \left[G(t) - (G(t-1) - T(t-1)) \right]$

Seasonal index:

(10) $S(t+L) = S(t) + \gamma \left[\dfrac{V(t)}{G(t)} - S(t) \right]$

For the constant model

$T(t) = 0, \beta = 0, S(t) = 1.0, \gamma = Gamma = 0$

For the trend model

$S(t) = 1.0, \gamma = Gamma = 0$

For the seasonal model

$T_{(t)} = 0, \beta = 0$

Trend and Seasonal Models with First-Order Exponential Smoothing

---

P(t+i)　=　The forecast calculated for the period (t+i) in the current period (t)

i　　=　Forecast horizon

G(t)　=　The current basic value for the current period (t)

G(t-1)　=　The previous basic value from the previous period

L　　=　Period length (often 12)

V(t)　=　Actual demand (history) for the current period (t)

T(t)　=　The current trend value calculated for the current period

T(t-1)　=　The previous trend value from the previous period

S(t)　=　The seasonal index for the period (t)

S(t-L)　=　The previous seasonal index for the period (t)

α　　=　Smoothing factor for the basic value 'G', 0 < α < 1

β　　=　Smoothing factor for the trend value 'T', 0 < β < 1

γ　　=　Smoothing factor for the seasonal indices 'S', 0 < γ < 1

Second-Order Exponential Smoothing

If, over several periods, a time series shows a change in the average value such that a trend pattern is revealed, first-order exponential smoothing produces forecast values that lag behind the actual values by one or several periods. You can achieve a more efficient adjustment of the forecast to the actual values pattern by using second-order exponential smoothing.

The second-order exponential smoothing model is based on a linear trend and consists of two equations (see formula (11)). The first equation corresponds to that of first-order exponential smoothing except for the indices in brackets. In the second equation, the values calculated in the first equation are used as initial values and are smoothed again.

Seasonal index:

$$(11) \quad G^{(1)}(t) = \alpha V(t-1) + (1-\alpha) G^{(1)}(t-1)$$

$$G^{(2)}(t) = \alpha G^{(1)}(t) + (1-\alpha) G^{(2)}(t-1)$$

$G^{(1)}$	=	Simply smoothed basic
$G^{(2)}$	=	Doubly smoothed basic
V	=	Historical value
α	=	Smoothing factor

Evaluating Forecast Accuracy

Every forecast should provide a basis for a decision in some form. So that changes in a time series pattern can be recognized early, the following parameters are calculated in the R/3 System:

- Error total

- Mean absolute deviation (MAD)

- Tracking signal

- Theil coefficient

Error Total

$$(12) \quad ET \; = \; \sum_{t-1}^{n} \left[\, V(t) - P(t) \,\right]$$

Mean Absolute Deviation for Initialization

$$(13) \quad MAD \; = \; \frac{1}{n} \sum_{t-1}^{n} \left|\, P(t) - V(t) \,\right|$$

$$n \quad = \quad \text{Number of periods for initialization}$$

Mean Absolute Deviation for the Ex-Post Forecast

$$(14) \quad MAD(t) \; = \; (1 - \delta) * MAD(t-1) + \delta * \left|\, V(t) - P(t) \,\right|$$

Tracking Signal

$$(15) \quad TS \; = \; \left|\, \frac{ET}{MAD} \,\right|$$

Theil coefficient for the Ex-Post Forecast

$$(16) \quad U = \sqrt{\frac{\sum\limits_{t=1}^{T}\left(P(t)-V(t)\right)^2}{\sum\limits_{t=1}^{T}\left(V(t)-V(t-1)\right)^2}}$$

Key
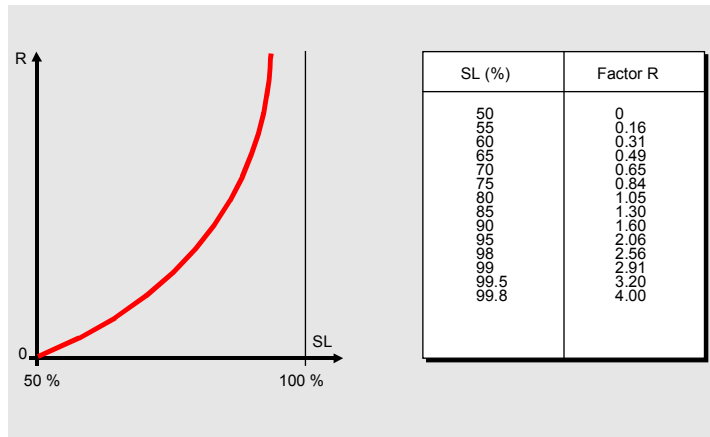
P(t)　=　**Forecast value**

V(t)　=　**Actual value**

ET　=　**Error total**

TS　=　**Tracking signal**

Safety Stock Calculation

The safety stock depends on the service level that you specified in the MRP II view of the material master record and on the accuracy of the forecast. The more accurate the forecast, the smaller your safety stock can be.

The following figure shows that, without safety stock, customer demand can be satisfied by 50%. It also shows that it is almost impossible to satisfy customer demand 100% of the time. Factor R describes the relationship between forecast accuracy and service level (SL).

SL (%)	Factor R
50	0
55	0.16
60	0.31
65	0.49
70	0.65
75	0.84
80	1.05
85	1.30
90	1.60
95	2.06
98	2.56
99	2.91
99.5	3.20
99.8	4.00

If replenishment lead time is greater than the forecast period by factor W, then the mean absolute deviation (MAD) is recalculated for this period (formula 17). The MAD is a parameter of forecast accuracy. Otherwise, see formula 18.

Safety Stock (SS) Formulas

Formula 17

$$SS = R \times \sqrt{W} \times MAD$$

$$W = \frac{\text{Delivery time (in days)}}{\text{Forecast period (in days)}}$$

Formula 18

$$SS = R \times W \times MAD$$

If the material is produced in-house, the delivery time is: opening period + in-house production time + goods receipt processing time. It is expressed in workdays. The forecast period is taken from the material master record and is also expressed in workdays.

If the material is procured externally, the delivery time is: goods receipt processing time + planned delivery time + goods receipt processing time. It is expressed in calendar days. The forecast period is taken from the material master record and is also expressed in calendar days.

The safety stock calculation may lead to rounding effects.

Minimum Safety Stock

You can specify a minimum safety stock. If the result of the safety stock calculation is lower than this limit, the safety stock is then automatically set to this minimum value. You enter the minimum safety stock in the material master record (the MRP 2 screen).

Reorder Level Calculation

The reorder level is defined as the sum of the safety stock plus the requirement forecast within the replenishment lead time (see formula (17)).

A forecast was carried out on a monthly basis. A month has 30 days in the case of external procurement.

Safety stock		100
Forecast	1st subsequent period	200
	2nd subsequent periode	00
	3rd subsequent period	400
Replenishment lead time	40 days	0/30
		30/30 + 10/30

(an entire monthly requirement + a part of the the following month)

Reorder level = 100 + 30/30 * 200 + 10/30 * 300   = 400