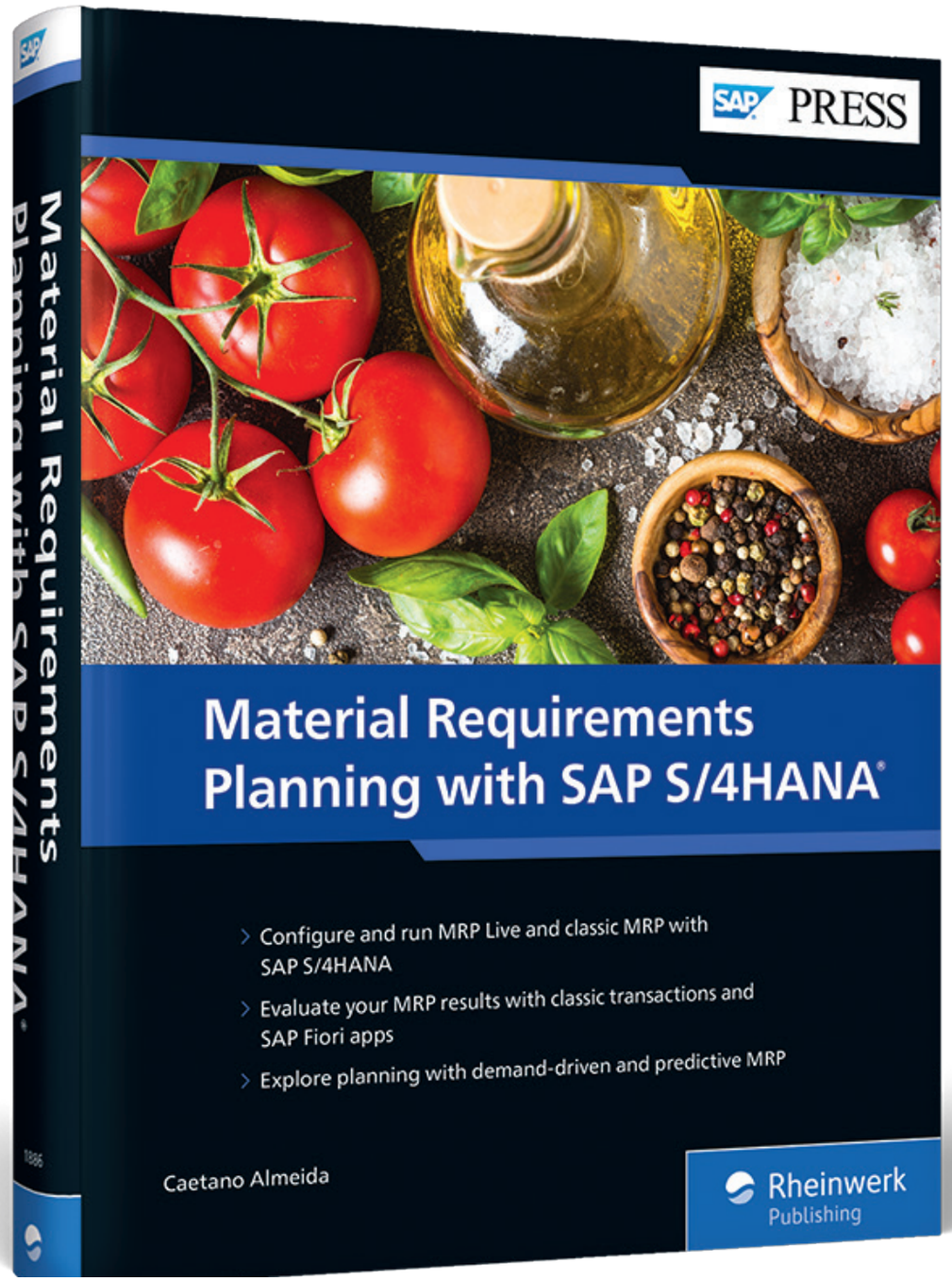

Browse the Book

In this sample chapter, get step-by-step instructions for configuring MRP in your SAP S/4HANA system, from the overall plant parameters through the MRP group, MRP type, MRP areas, and beyond.

"Configuring MRP"

Contents

Index

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Chapter 4
Configuring MRP

This chapter gives step-by-step instructions for configuring MRP in SAP S/4HANA. We will start with overall plant parameters, which are the foundation of the MRP run. Then we explain the Customizing steps related to the master data and to the MRP planning process described in previous chapters.

As discussed in the previous chapter, customizing data is usually created during the SAP implementation project. It defines the business processes' design and tailors the system behavior according to company business requirements. The MRP configuration is nothing more than the creation of this customizing data in the SAP Customizing Implementation Guide (SAP IMG). Figure 4.1 shows the **Material Requirements Planning** path in the SAP IMG.

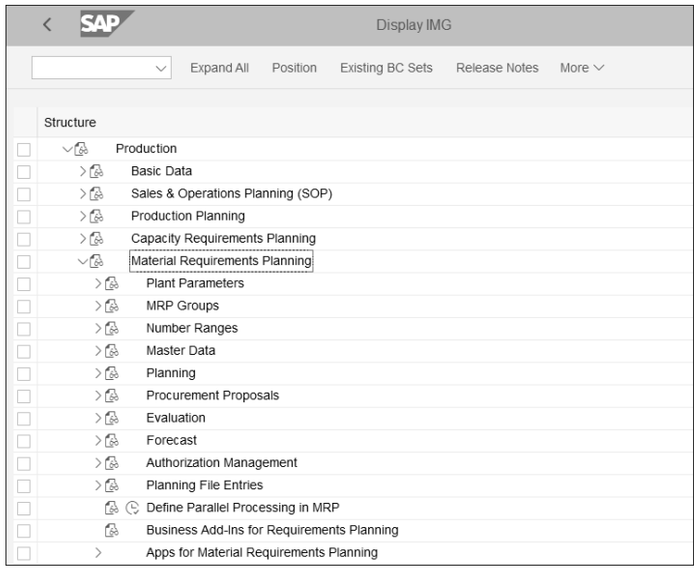


Figure 4.1 Material Requirements Planning in the SAP IMG

Tip

Use Transaction OPP1 to open the SAP IMG directly in the Customizing tree for MRP.

For MRP, the plant is the main organizational structure, so all MRP customizing is tied to the plant. We will start this chapter in Section 4.1 by describing how to maintain the MRP plant parameters in Customizing. We will also introduce the MRP group in Section 4.2 and explain how to use it to define Customizing settings for a specific group of materials.

We will then come back to the topics discussed in the previous chapters. In Section 4.3, we review the Customizing related to the MRP types and special procurement types, continuing with all the Customizing settings related to the MRP planning process, such as the already mentioned lot-sizing procedures (Section 4.4) and availability checks (Section 4.5).

A very important topic of discussion in this chapter will be the Customizing of MRP areas. The usage of MRP areas is required in SAP S/4HANA for storage location planning and for subcontracting, so we will discuss in detail the creation of MRP areas in Customizing in Section 4.6.

Finally, we will go through some general MRP-related configuration related to the planning file entries and the parallel processing used by classic MRP in Section 4.7. By the end of this chapter, we will have MRP configured and ready for execution.

4.1 Overall Plant Parameters

As mentioned in the beginning of this chapter, all the MRP customizing is plant-dependent, so we can define different MRP settings for each plant. The most important MRP settings for each plant are clustered in a single transaction, in which we can maintain all those parameters at once. This Customizing activity can be found under the MRP Customizing tree in the **Plant Parameter**s folder, or we can access it directly using Transaction OPPQ.

Note

In SAP ERP, the Customizing step to configure MRP for a new plant was to activate MRP for this plant in the customizing Transaction OMDU. This Customizing step is no longer required in SAP S/4HANA, which considers that MRP is active for all plants by default.

When accessing Transaction OPPQ, on the first screen we have the option to create, change, display, or copy the plant parameters for MRP. Because the plant is usually created through copying, an entry usually will already exist for the plant and we can maintain it directly. If an entry does not exist for the plant, we suggest you use another plant as a template through the copy option.

The plant maintenance screen shown in Figure 4.2 is divided into different screen areas (**Maintain Environment**, **Maintain Master Data**, **Maintain Planned Orders**, and **Maintain Planning Run**), in which each button will point to a Customizing activity. In the following sections, we will describe in detail each of those Customizing steps and the impact of those settings in MRP.

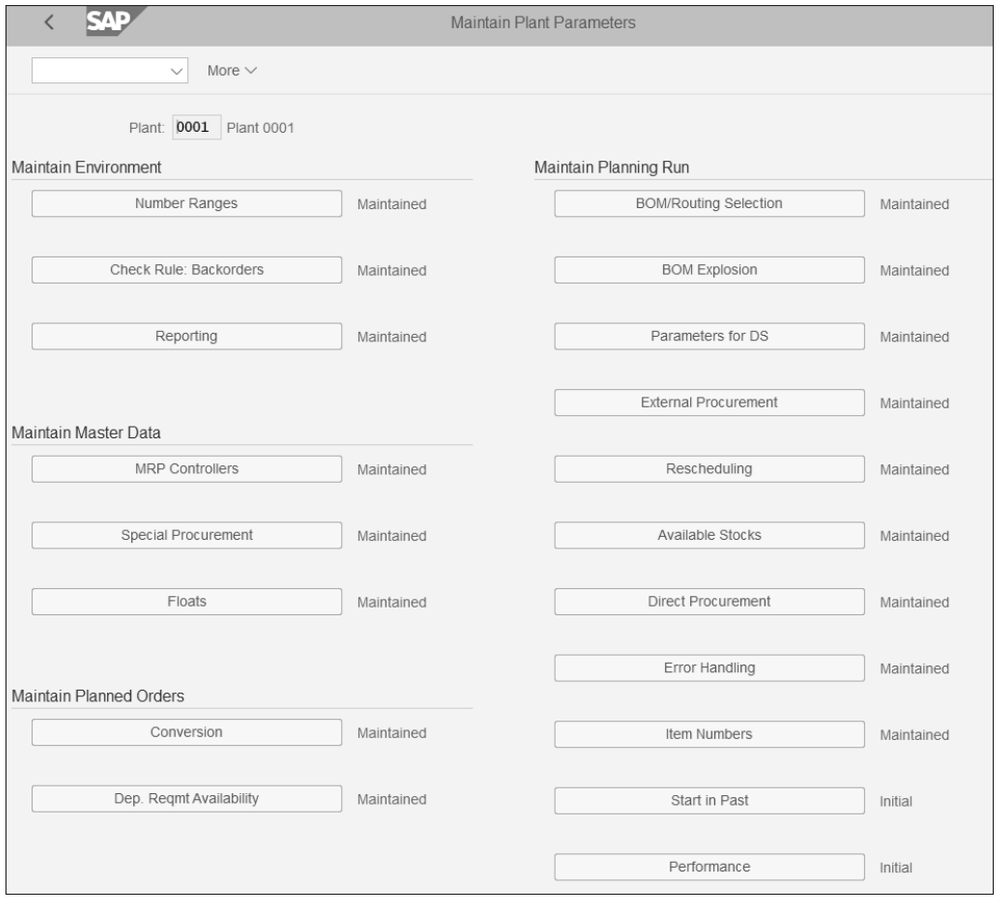


Figure 4.2 Maintain Plant Parameters during Customizing

4.1.1 Maintain Environment

The **Maintain Environment** section shown in Figure 4.3 lists the general MRP settings. In this section, we will discuss the details behind those Customizing activities.

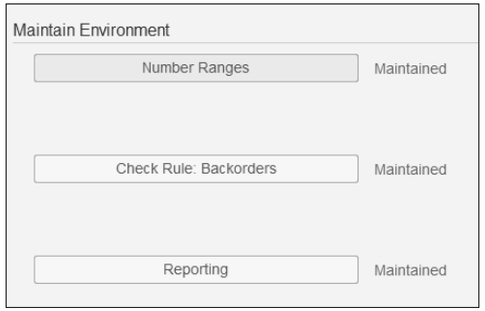


Figure 4.3 Maintain Environment Section in the Overall Plant Parameters Customizing

Number Ranges

The first and most important setting is the **Assign Number Ranges** activity. There are five different MRP objects for which we need to assign number ranges:

- Planned orders
- Reservations/dependent requirements
- Purchase requisitions
- MRP Lists
- Simulative dependent requirements (LTP-dependent requirements)

For each of those objects (see Figure 4.4), we will have to assign a number range interval, which will be used to determine the number of new objects generated by MRP. The number range for objects created by MRP during the planning run should be all internal because MRP should be able to determine the numbers automatically.

> **Tip**
>
> The Customizing activity to assign number ranges in Transaction OPPQ only allows us to assign an existing number range interval for an object. We can create or maintain the number range intervals for those objects in the customizing Transaction OMI2.

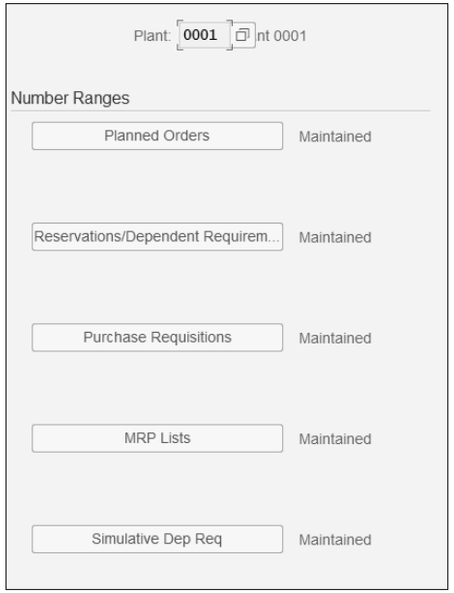


Figure 4.4 MRP Number Ranges

SAP delivers the following number ranges in Customizing, which are generally used without changes:

- Planned orders: Internal number range 1 with an interval from 1 to 19999999
- MRP Lists: Internal number range 1 with an interval from 1 to 9999999999
- Reservations and dependent requirements: Internal number range 1 with an interval from 1 to 9999999999
- Purchase requisitions: Internal number range 1 with an interval from 10000000 to 19999999

Under the Customizing activity to assign a number range interval for a planned order, we have the option to assign different intervals for planned orders created by MRP and long-term planning (LTP). The same interval can be used for both types of planned orders, and in this case, this interval will be shared by both order types. If we want to differentiate those planned order types by number, we should assign a different interval for each one.

Note that although the number range is considered a Customizing activity, it is not automatically transported. That is because the current number for each interval may

not be the same in different systems, so a transport could lead to number range inconsistencies. If needed, number range intervals should be transported manually, and the current number should be adjusted in the target system.

For all the number range objects, there is a percentage of remaining numbers in the interval defined in Customizing for which SAP S/4HANA should trigger a warning message. For design reasons, a warning message cannot be triggered during classic MRP execution in the background, so the classic MRP execution is terminated with a short dump when this percentage of remaining numbers is reached for purchase requisitions (object BANF), planned orders (object PLAF), and reservations (object RESB). MRP Live, however, will not consider this warning and will only terminate when there are no more numbers available in the interval. In both cases, we will need to manually adjust the number range, extending it or creating a new interval.

In addition, the number ranges in MRP are buffered, and there are always some numbers stored in the number range buffer. Therefore, we need to reset the number range buffer after any change to a number range interval in order to clear those numbers stored before the change. The global reset can be done in Transaction SM56 by pressing the F5 key; entering the client, object, and range; and selecting the **Global Reset** indicator.

Checking Rule: Backorders

The second Customizing activity in the **Maintain Environment** section in Figure 4.3 is **Checking Rule: Backorders**, during which we will define a specific available-to-promise checking rule to be used when updating backorders in Transaction CO06. This checking rule is not the one generally used for the planned order availability check and is used for backorders only.

Reporting

The third and last Customizing activity in this section is reporting. These Customizing settings are related to the MRP evaluation transactions, so we will explore them later in Chapter 6.

4.1.2 Maintain Master Data

Under the **Maintain Master Data** section of the plant maintenance screen, we will perform the plant-dependent Customizing settings that are related to the MRP master data, as shown in Figure 4.5.

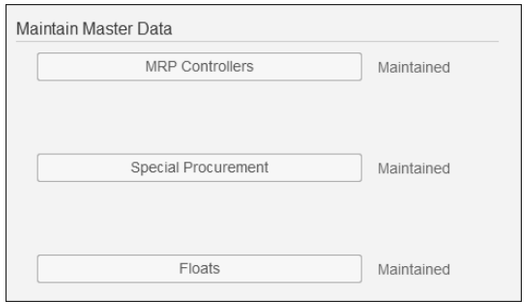


Figure 4.5 Maintain Master Data Section in the Overall Plant Parameters Customizing

MRP Controllers

The first setting is one of the simplest and at the same time most important MRP settings. In the **Maintain MRP Controllers** activity, we will create or change the MRP controller, a mandatory field on the **MRP 1** tab of the material master. The MRP controller, also known as the planner, is the person responsible for planning and analyzing the MRP results for a set of materials and for taking actions to resolve problems and exceptions that may occur during the MRP run.

The definition of the MRP controller is very important because it is used as a key selection criterion in many production planning transactions, such as the collective entry of the Stock/Requirements List, the planned order mass processing transaction, and even the MRP execution with MRP Live. Therefore, before creating the MRP controller in Customizing, we need to think about the products that will planned and who will be responsible for those materials.

Adding too many materials for a single MRP controller may lead to a situation in which the planner cannot handle all the problems and exceptions. It could also lead to performance issues when executing the MRP mass processing transactions. On the other hand, only adding a few materials to each MRP controller may increase the total number of MRP controllers, which is also not desirable.

In this Customizing activity, we will create and maintain the MRP controllers and assign an MRP controller for missing parts in this plant. Figure 4.6 shows the details for the MRP controller Customizing settings. These settings will not influence the system behavior and will instead maintain data about the MRP controller itself, such as the **Telephone** and the **Recipient Name** fields.

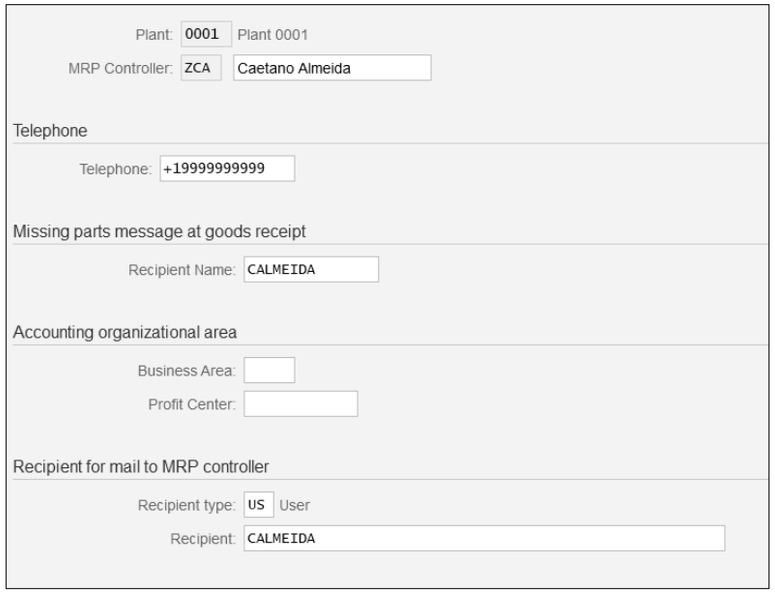


Figure 4.6 Details of the MRP Controller Customizing

Some companies decide to use generic MRP controller titles, such as Finished Products MRP Controller or Raw Material MRP Controller, whereas other companies choose to create MRP controllers with a reference to the actual people who will be in charge of planning those materials.

Generic MRP controllers require less maintenance of Customizing data, but MRP controllers that reference the users themselves will also have some advantages. For example, if ever there is a problem with a particular material, any user will be able to identify the person responsible for planning this material and contact them directly. In the latest versions of the SAP Fiori applications for DDMRP, for example, it is possible to call the MRP controller directly through Skype to expedite the supply.

Warning

We might have to access the MRP controller Customizing settings very frequently to create or change MRP controllers. In this case, we can open the Customizing transaction for changes in the productive system by following the procedure outlined in SAP Note 388936.

Special Procurement

The next step under the **Maintain Master Data** section is the **Special Procurement** Customizing activity. While discussing special procurement types in master data in Chapter 3, we noted that some Customizing entries are delivered standard, but we may have to create our own custom special procurements when using stock transfer, withdrawal from alternative plant, or production in alternative plant processes.

In these cases, we need to create our custom special procurement types because we need to specify the sourcing or alternative plant. If we have stock transfers with different supplying plants, we will need to create a different special procurement type for each plant. We have shown an example of a custom special procurement type in Chapter 3, Figure 3.23, in which we determined the supplying plant for a stock transfer.

Figure 4.7 shows an additional example, in which we have created a new special procurement type (72), setting the **Issuing Plant** value to 0002 for withdrawal and selecting the **Withdra. Altern. Plant** (withdrawal from alternative plant) checkbox.

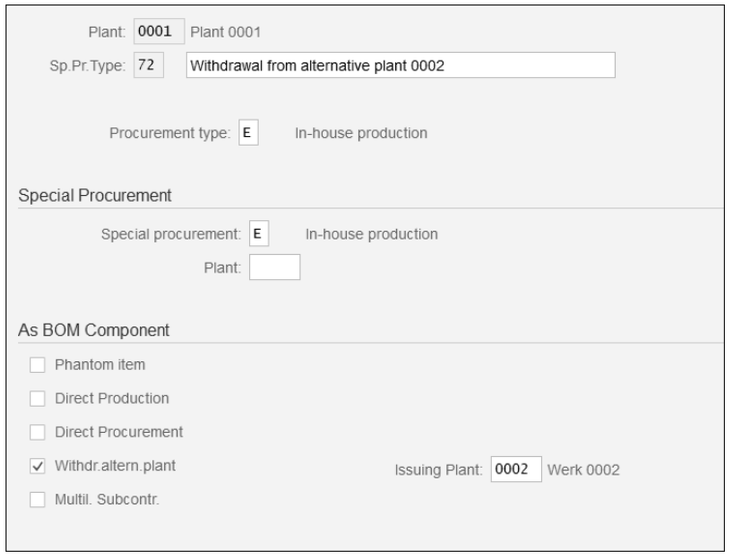


Figure 4.7 Withdrawal in Alternative Plant with the Issuing Plant

We may also have to create custom MRP types when working with storage location MRP areas. With this kind of MRP area, the storage location will be planned separately, and we can use a special procurement type to determine the source storage

location for an internal stock transfer. In this very specific scenario, we will use special procurement **45—Stock Transfer from Plant to MRP Area**, but the ordering plant and the supplying plant will be the same, as shown in Figure 4.8. In this special case, we will find an additional field, **Stock Transfer**, through which we can determine if MRP will generate stock transfer requisitions or stock transfer reservations.

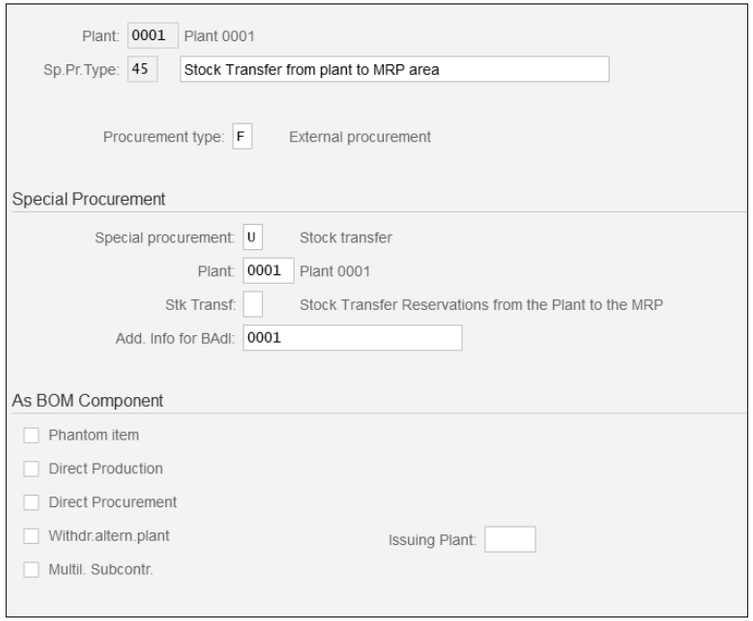


Figure 4.8 Stock Transfer from Plant to MRP Area

Note

By default, MRP will not determine the storage location for stock transfers, but we can use a BAdI to do so. In this case, we can enter the source storage location in the special procurement Customizing using the **Additional Information for BAdI** field.

You can use the `MD_EXT_SUP` BAdI for this purpose in classic MRP and the `PPH_MRP_SOURCING_BADI` ABAP-Managed Database Procedure (AMDP) BAdI for this purpose in MRP Live.

Floats

The third step of the **Maintain Master Data** section is the **Floats** activity, in which we will define the scheduling margin keys, mentioned in the previous chapter. Scheduling margin keys 000 and 001 are predelivered in Customizing, as shown in Figure 4.9, but we can create new entries with different values for the floats.

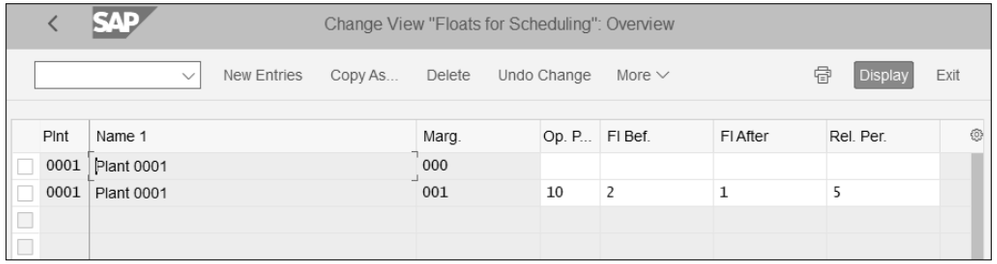


Figure 4.9 Scheduling Margin Keys in Customizing

4.1.3 Maintain Planned Orders

The section under the **Overall Plant Parameters** Customizing settings is related to planned orders (see Figure 4.10). Both of the Customizing activities found here are related to the conversion of planned orders to production/process orders or purchase requisitions.

Figure 4.10 Maintain Planned Orders Section in the Overall Plant Parameters Customizing

Conversion

Under the **Conversion** activity, there will be two options to define the settings for the planned order conversion. Under the **Planned Order • Production Order** activity, we can select the default order types for the planned order conversion to production orders and process orders, as shown in Figure 4.11. The order types defined in this Customizing activity will be used when we convert planned orders with the MRP

transactions, such as the Stock/Requirements List, for example. In the second option, we will simply define a maximum number of planned orders to be proposed.

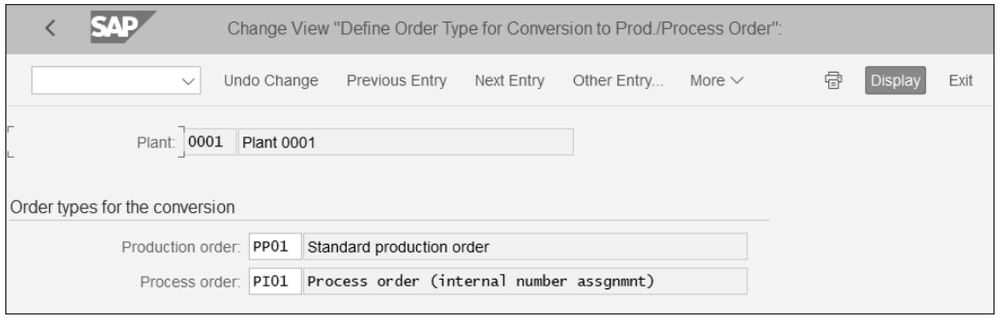


Figure 4.11 Default Order Types for Conversion

Under the **Planned Order • Purchase Requisition** activity, we will only define a limit for the number of planned orders proposed in the collective conversion of planned orders into purchase requisitions (Transaction MD15). This is basically a measure to avoid performance or memory overflow issues during the planned order conversion. The default value proposed is 500, and the maximum number allowed is 999; however, if the field is left empty, there will be no maximum number of planned orders to be converted.

Dependent Requirements Availability

In the **Dependent Requirements Availability** Customizing activity, we will only define the checking rule that will be used when running the availability check for planned orders. This checking rule is used in conjunction with the availability check defined in the material master to determine the scope of the availability check—in other words, which planning elements will be considered during the availability check. We will see the scope of check Customizing later in Section 4.5.

4.1.4 Maintain Planning Run

Let's examine the final section of the plant maintenance Customizing screen shown in Figure 4.2: **Maintain Planning Run** (see Figure 4.12).

This is the section where we will find the most important settings of the **Overall Plant Parameters** Customizing activity. Here, we will find settings to influence the BOM explosion, the detailed scheduling that happens during the MRP run, the creation of

replenishment proposals for external procurement, the rescheduling check, and other settings relevant to the planning run. In the following sections, we will examine each setting in detail.

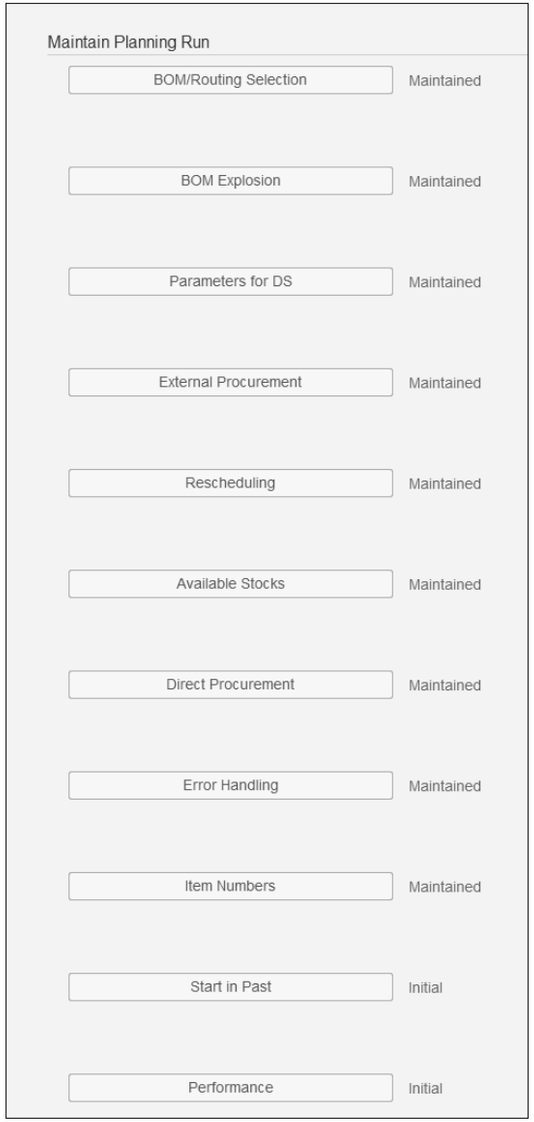


Figure 4.12 Maintain Planning Run in the Overall Plant Parameters Customizing

BOM/Routing Selection

BOMs are selected according to a BOM selection ID, and we will define which BOM selection ID will be used for each plant in this Customizing activity.

The BOM selection ID basically will determine which BOM usages will be considered by MRP and in which order. These IDs should be created in advance in the BOM customizing Transaction OS31 (see Figure 4.13), and we will only choose which one should be considered by MRP for the plant.

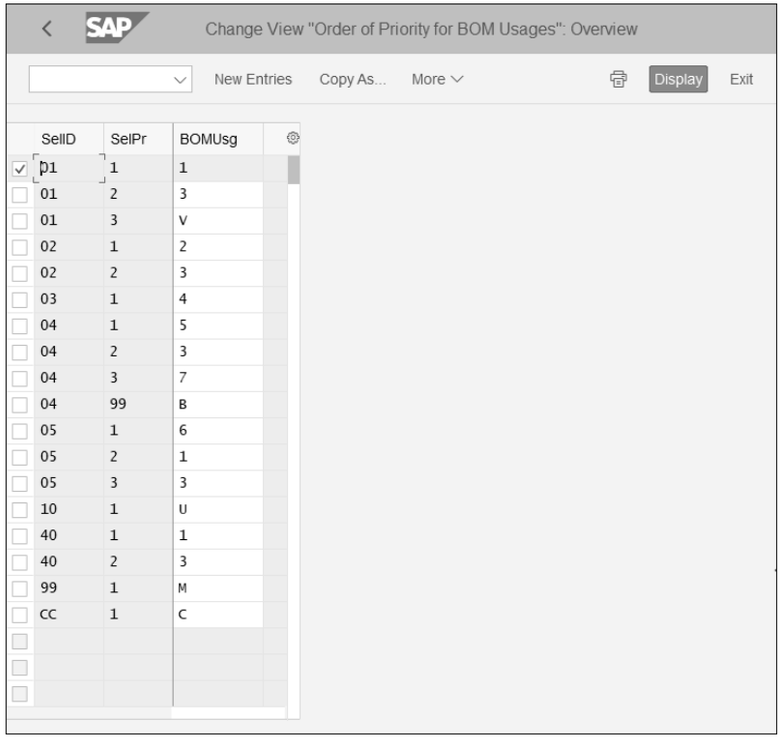


Figure 4.13 BOM Selection ID Customizing

The default option is to use BOM selection ID 01, which will consider production BOMs with the highest priority, followed by universal BOMs.

In SAP S/4HANA, MRP will select the BOMs according to the production version due to the logic implemented by simplified sourcing. However, if there are different production versions and each one references a BOM with a different usage, then MRP

will select the production version according to the priority defined in the BOM **Selection ID** field.

> **Note**
>
> This Customizing activity was also affected by MRP simplifications implemented in SAP S/4HANA. In SAP ERP, we could also choose a routing selection ID, but this option is no longer available because routings will be selected by MRP according to the production version only.

BOM Explosion

Under the **BOM Explosion** Customizing activity, we have settings that will influence the dates used for the master data selection and additional settings related to the BOM explosion during the planned order creation by MRP. Figure 4.14 shows the details of these Customizing settings.

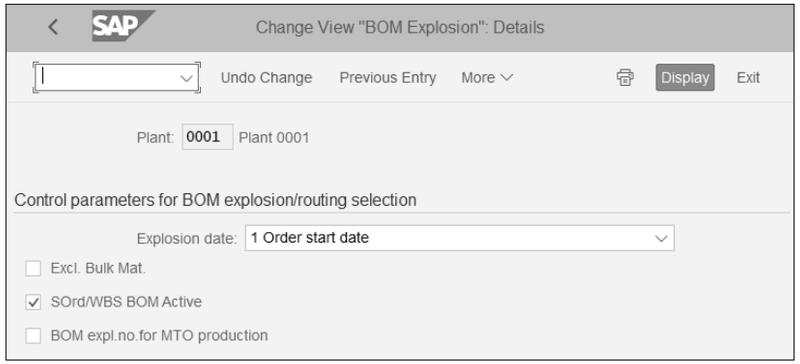


Figure 4.14 BOM Explosion Customizing

The first one is the **Explosion Date** Customizing activity, which will determine the date used for the master data determination in MRP:

- **Order Start Date**: Master data will be read on the planned order start date.
- **Order Finish Date**: Master data will be read on the planned order finish date.
- **BOM Explosion Number/Order Start Date**: The SAP S/4HANA system will first check for the existence of a BOM explosion number and try to read the master data according to the BOM explosion number date. If no BOM explosion number is found, then master data will be read on the planned order start date.

- **BOM Explosion Number/Order Finish Date**: The SAP S/4HANA system will first check for the existence of a BOM explosion number and try to read the master data according to the BOM explosion number date. If no BOM explosion number is found, master data will be read on the planned order finish date.

Note

We will talk more about BOM explosion numbers in Chapter 8 when we discuss advanced MRP features.

When the **Exclude Bulk Materials** flag is checked, MRP will not create a dependent requirement for bulk materials during the BOM explosion. In this case, those bulk materials will not be displayed in the planned order components list and an entry will not be created for those items in table RESB. This setting can be useful when there are too many components for the planned order, which leads to performance issues during the MRP run.

We discussed in the previous chapter that we can create sales order and WBS BOMs and that those BOMs can be considered by MRP when creating or changing a new planned order. The **Sales Order/WBS BOM Active** Customizing setting can be used to control whether MRP will consider those types of BOMs or if it will only consider material BOMs. When this flag is checked, in the case of make-to-order (MTO) or make-to-project (MTP) production, MRP will first look for a sales order or WBS BOM, respectively, and it will try to read a material BOM according to the production version only if it cannot find a valid BOM.

At last, we have the **BOM Explosion Number for MTO Production** setting, which should be checked when we want to have the BOM explosion number copied for dependent receipt elements that are linked to the sales order special stock. This setting is also valid for MTP production and receipt elements under the project/WBS special stock.

Parameters for Detailed Scheduling

We noted earlier that the in-house production time defined in the material master can be used to calculate the planned order basic dates and that the routing operation duration can be used to calculate the planned order production dates in a process called *detailed scheduling*.

Under the **Parameters for Detailed Scheduling** Customizing activity, we will find all the settings that can be used to influence the detailed scheduling during the MRP run.

As shown in Figure 4.15, we have the option to define different detailed scheduling parameters for each combination of plant, planned order type, and production scheduler supervisor. We can also create generic entries that are valid for all the planned order types and production scheduler supervisors by using the asterisk (*) character. In this Customizing activity, we can also create different detailed scheduling parameters for each specific LTP scenario so that MRP and LTP can have independent detailed scheduling settings.

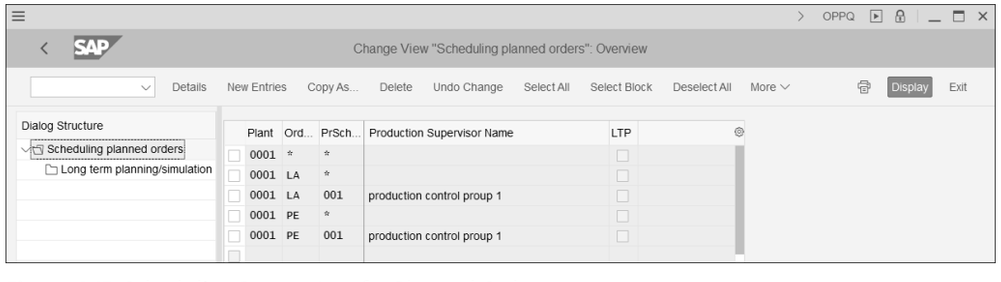


Figure 4.15 Scheduling Parameters for Planned Orders

In the detail screen of the **Scheduling Parameters** Customizing activity (see Figure 4.16), you will notice some differences if comparing SAP S/4HANA with SAP ERP. In SAP ERP, we would have independent settings for detailed scheduling, rate-based scheduling, and rough-cut scheduling, with a different routing selection ID for each scheduling level. In SAP S/4HANA, we will only have the detailed scheduling, and the routing will be selected according to the production version only. If we are using repetitive manufacturing and we want to select a rate routing, for example, we will simply create a production version with reference to the rate routing, and it will be considered by MRP during lead-time scheduling.

Note

See SAP Note 2380568 (SAP S/4HANA Simplification Item: Rate and Rough-Cut Planning) for details about the simplification item that changed the scheduling parameters Customizing.

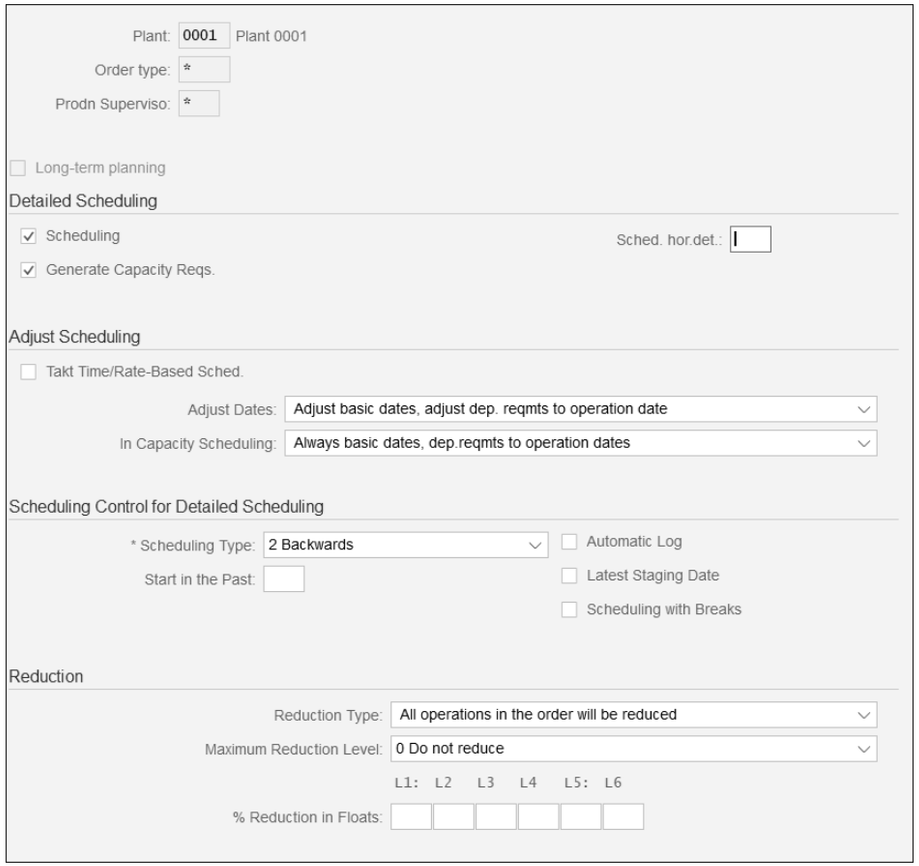


Figure 4.16 Details of the Scheduling Parameters Customizing

If we want to run detailed scheduling during MRP and want to use capacity leveling for planned orders, we need to ensure that the **Scheduling** and **Generate Capacity Requirements** checkboxes are set for the plant/planned order type/supervisor.

We can also define a scheduling horizon for detailed scheduling (the **Sched. Hor. Det.** field) to limit the detailed scheduling so that it is executed just for planned orders within this horizon. When we are using very complex routings, especially with variant configuration, MRP may have to spend a lot of time reading the routing and scheduling planned orders. In this case, it might be a good idea to limit the detailed scheduling within a shorter horizon in order to avoid performance problems during

MRP. This horizon will depend on the product's lead time; we should ensure that it includes all the planned orders that we expect to see in the capacity management transactions and SAP Fiori applications.

Another important setting that we can find during the under this Customizing activity is **Scheduling Type**. During the MRP run, SAP S/4HANA will first calculate the planned order basic start and finish dates using the in-house production time defined in the material master, considering the shortage date as the planned order finish date and then using backward scheduling to calculate the basic start date. Once the basic dates are calculated, detailed scheduling is executed to calculate the production dates—and this is where the scheduling type defined in Customizing will be used.

The following scheduling types are the most frequently used during the MRP run:

- If **Backward Scheduling** is selected, MRP will consider the basic finish date as the production finish date and will calculate the production start date using the routing.
- If **Forward Scheduling** is selected, MRP will consider the basic start date as the production start date and will calculate the production finish date using the routing.

As a best practice, we suggest that you keep the in-house production date in the material master as close as possible to the total duration of the routing operations in order to avoid differences between the basic dates and the production dates. Another way to avoid those differences is to use the **Adjust Dates** setting by selecting one of the options where the basic dates will be adjusted. In this case, whenever there is a difference between the in-house production time and the routing duration, the basic dates will be automatically adjusted by MRP to match the basic finish date.

Note

In general, only the planned order basic start date will be adjusted by MRP. The basic finish date will be only adjusted by MRP under a very specific scenario, in which the basic finish date initially calculated with the in-house production time was after the requirement date, in order to avoid the planned order starting in the past. In this specific case only, if the production start date is earlier than the basic finish date, the basic finish date will be adjusted to match the production date.

External Procurement

The **External Procurement** Customizing activity brings plant-level settings related specifically to replenishment proposals created for external procurement. Figure 4.17 shows the settings and details of this Customizing activity.

The **Purchasing Processing Time** setting is a buffer of working days considered when scheduling a replenishment proposal with external procurement. It should represent the time that the purchasing department will take to process a purchase requisition and generate a purchase order. The value maintained here will be considered for all the purchase requisitions created by MRP for the entire plant. It will affect the delivery date calculation, so we need to ensure that a realistic value is used here. In our example, we used a purchasing process time of one day.

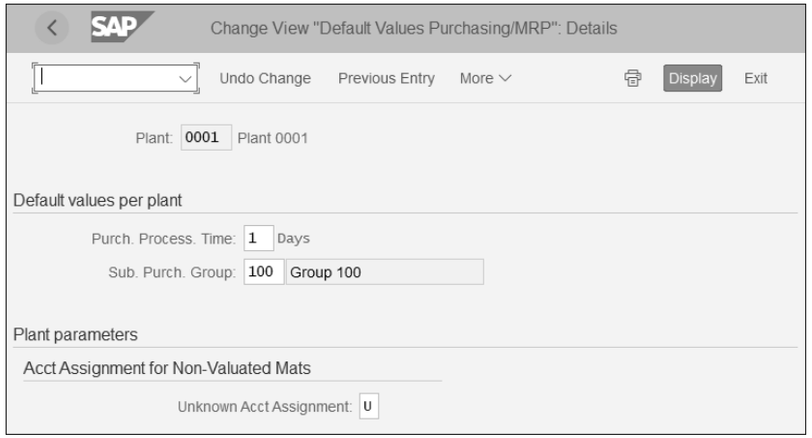


Figure 4.17 External Procurement Customizing Settings

The purchasing group is generally defined for a material in the **Purchasing** tab of the material master and is considered by MRP when generating purchase requisitions. If the **Purchasing Group** field is empty in the material master, then MRP will read the **Substitute Purchasing Group** value defined in the **External Procurement** Customizing activity. We can also define a default account assignment for purchase requisitions created for nonvaluated materials in the **Unknown Account Assignment** field.

In this Customizing activity, we have another impact of the simplified sourcing logic implemented in SAP S/4HANA. In SAP ERP, we would be able to choose here if the planned delivery time considered when scheduling an externally procured replenishment proposal would come from the material master or from the info record/

scheduling agreement. In SAP S/4HANA, this setting is no longer available because MRP will always consider the planned delivery time from the info record or scheduling agreement, as they are relevant for automatic sourcing. This is because they are generally more accurate than the generic value defined in the material master.

In SAP ERP, we could define in this Customizing activity the creation indicator for schedule lines, which allows us to choose if schedule lines should be generated or not for materials belonging to this MRP group. This setting is no longer available because in SAP S/4HANA, MRP will always create schedule lines if there is an MRP-relevant scheduling agreement.

Rescheduling

The rescheduling check happens during the MRP run or during the evaluation of the MRP results. In this process, MRP will check for fixed MRP elements in the future that could cover a requirement. If MRP finds a fixed MRP element within the rescheduling check, then it will generate an exception message suggesting that the MRP controller reschedule the MRP element instead of generating a new replenishment proposal.

In the Customizing activity **Rescheduling**, we can define the horizon considered in the rescheduling check and which firm elements will be considered by MRP. Figure 4.18 shows the details of this Customizing activity.

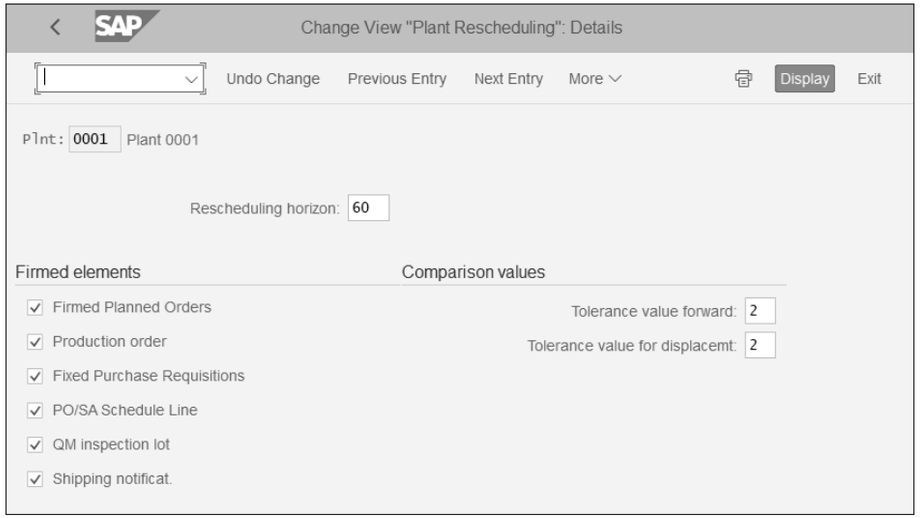


Figure 4.18 Rescheduling Customizing

The **Rescheduling Horizon** field is a value in working days, and it defines the period for which MRP will look for fixed elements in the future to cover a shortage. The calculation of the rescheduling horizon only starts at the end of the replenishment lead time.

Example

Consider a rescheduling horizon of 60 working days, as shown in Figure 4.18. If we have a shortage on January 10, MRP will look for firm replenishment elements in the following 60 working days to cover this shortage. If a production order is found on February 1, MRP will not create a new planned order to cover the shortage on January 10 and will suggest that the MRP controller change the dates of the existing production order to cover the shortage.

Besides the rescheduling horizon, we can define which specific MRP elements will be included in the rescheduling check in this Customizing activity. Considering the previous example, if we do not want MRP to propose the date changes in the production order, we can uncheck the **Production Order** flag in Customizing. This way, MRP would still create a new planned order to cover the shortage, even though there is a production order within the rescheduling horizon.

In some situations, usually when the replenishment proposal is too close to the shortage date, we do not want MRP to create a new planned order, but we also do not want an exception message disturbing the MRP controller. In this case, we can use the **Tolerance Value Forward** and the **Tolerance Value for Displacement** settings to ensure that the element will be considered in the rescheduling check, but avoid the creation of the exception messages. Both tolerance values are calculated in working days. The forward value is used to suppress exceptions for MRP elements after the requirement, whereas the value for displacement is used to suppress exceptions for elements before the requirement.

Note

We will analyze the rescheduling check results and the respective exception messages in more detail in Chapter 5, in which we will discuss how to analyze MRP results.

Available Stocks

As we have shown, MRP considers the available stocks during the net requirements calculation in order to determine when there is a shortage. This available stock is generally unrestricted stock, but it can also include additional stock types, such as those represented by the following checkboxes:

- **Stock in Transfer**: This checkbox is for the stock that is being transferred. In a two-step stock transfer, we first post a goods issue when the material leaves the supplying plant and then post a second goods issue when it reaches the delivery plant. Between those movements, it is considered stock in transfer.
- **Blocked Stock**: This checkbox is for stock that we have intentionally blocked—perhaps for quality purposes, for example. A special goods movement is posted to move a certain quantity to blocked stock.
- **Restricted Use Stock**: When we are working with batches, there is a special restricted use batch status. This checkbox can be used, for example, when a whole batch has quality issues.

Under the **Available Stocks** Customizing activity, we can determine which of these stock types will be considered available during the MRP net requirements calculation by setting the respective flags, as shown in Figure 4.19. Once we uncheck one flag, the corresponding stock type will not be considered available during the MRP evaluation transactions, so it won't appear in the Stock/Requirements List, for example.

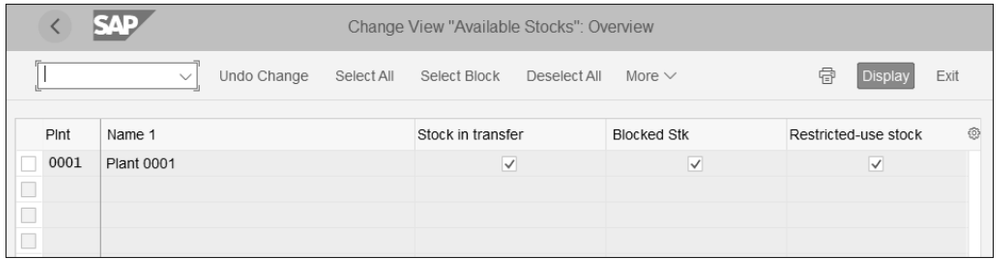


Figure 4.19 Available Stocks Customizing

Direct Procurement

When working with the special procurement type direct procurement or with non-stock items as BOM components, we have the option to define when the purchase requisition for directly procured components will be created in the **Default Values for Direct Procurement** Customizing activity, shown in Figure 4.20.

We can use the **Direct Procurement/Production** field to define if the purchase requisition will be created by MRP or only upon the conversion of the parent planned order to production order. In addition, we can choose a default value for the account assignment of purchase requisitions created with direct procurement. The default value is **U** (unknown), but it can be changed in this Customizing activity.

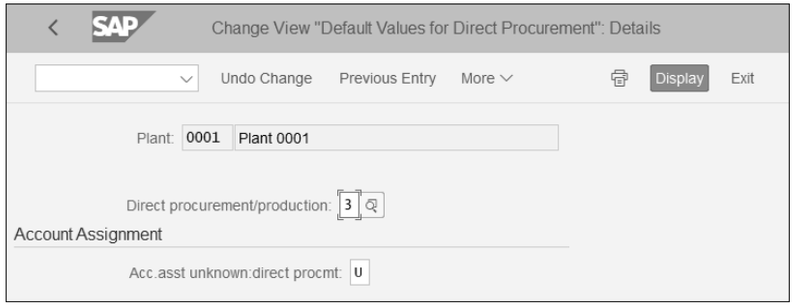


Figure 4.20 Default Values for Direct Procurement

Error Handling

In the **Error Handling** Customizing activity, we can find settings to prevent or handle possible errors during the MRP run.

The first setting is **Maximum Number of Proposals per Date**, shown in Figure 4.21. To avoid memory consumption problems or even performance problems during the MRP run, it is important to limit the number of replenishment proposals created in the same day.

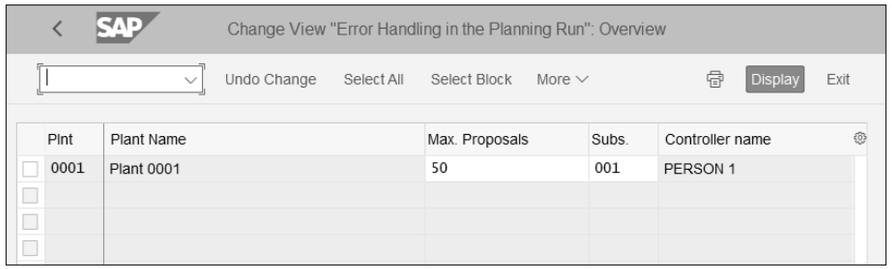


Figure 4.21 Error Handling in Planning Run

Example

In some scenarios, we may have to define a very small fixed lot sized for a material, such as 1, for example. In those cases, if a large requirement is created for this material, MRP will have to create hundreds of planned orders to cover this requirement, impacting the MRP performance and leading to memory consumption issues. We can use the **Maximum Number of Proposals per Date** setting to limit the number of orders created, avoiding this kind of problem.

When the maximum number of proposals per day that was determined in Customizing is reached, the planning run for this material will be terminated and we will see an error message in the Display MRP Master Data Issues app when using MRP Live or in the MRP List when using classic MRP.

In this Customizing activity, we can also determine a substitute MRP controller (the **Subs.** and **Controller Name** columns), which will be used only when MRP cannot determine an MRP controller for a material. This situation does not happen frequently in the system and should only be observed in the event of inconsistent master data.

Item Numbers

MRP can generate purchase requisitions for external procurement and stock transfer reservations when a special procurement type is used. Those purchase requisitions and stock transfer reservations created by MRP will only contain one item, and we can define in Customizing what item number will be used by MRP, as shown in Figure 4.22.

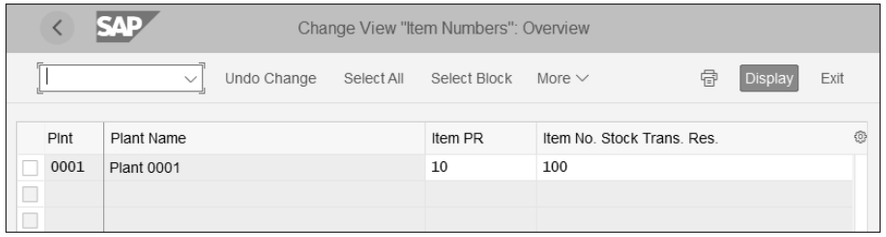


Figure 4.22 Item Numbers Customizing

The default values used for MRP are 10 for purchase requisitions and 100 for stock transfer reservations, and we will only change those values if we want to differentiate requisitions and reservations generated by MRP from the ones created manually.

Start in Past

When MRP is generating new replenishment proposals, it will generally consider the shortage date as the basic finish date, and it will calculate the basic start date using the in-house production time or the planned delivery time. Sometimes, the basic start date calculated by MRP may lie in the past, which means that there will not be enough time to produce or purchase the component.

Using the **Start in Past** Customizing setting, we can control whether MRP will allow a start in the past. If this flag is unchecked in Customizing, MRP will automatically switch to today scheduling when the basic start date is calculated in the past. *Today scheduling* means that the system will consider the planning date as the basic start date and it will use forward scheduling to recalculate the basic finish date.

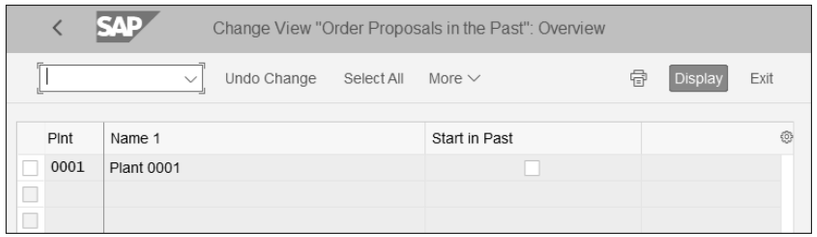


Figure 4.23 Start in Past Customizing

Allowing the start in the past is usually not a best practice because it will lead to replenishment proposals with unrealistic dates that cannot actually be met.

When we do not allow the start in the past, however, MRP may generate several different replenishment proposals on the same day, leading to an excessive number of rescheduling exception messages. Allowing the start in the past is usually an alternative to avoid this situation.

Performance

In the **Performance** Customizing activity, we can find another simplification implemented in SAP S/4HANA. In SAP ERP, we had the option to define here if MRP Lists would be stored in the transparent table `MDTB` or aggregated in table `MDTC`.

When storing the information in table `MDTB`, we could directly read this information in custom programs or queries. However, this was not a good option for performance. The aggregated table approach was faster, but data could not be directly read.

In SAP S/4HANA, the MRP List information will be only stored in table `MDTB` because we do not improve performance by aggregating the information when using an SAP HANA database. Therefore, the Customizing activity to define the aggregation of MRP Lists was removed from SAP S/4HANA.

> **Note**
>
> Because MRP Live will not generate MRP Lists, it does not save any information in those tables. Only when we run classic MRP is the information stored in the MRP List.

In this Customizing activity, we can still find the option to activate the BOM **Buffering** setting (see Figure 4.24) in order to improve the performance when exploding BOMs during the MRP run.

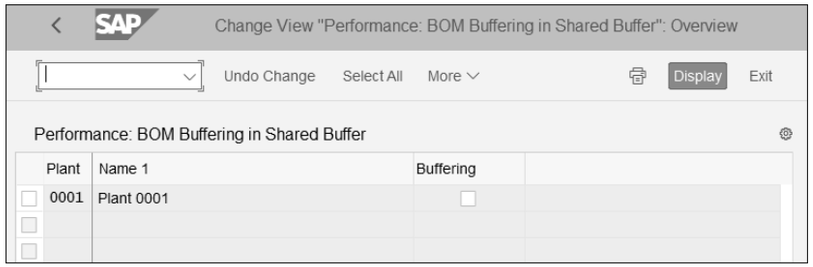


Figure 4.24 BOM Buffering

When we activate this setting in Customizing, we activate the cross-transactional buffering of the processed BOMs. This means that MRP will no longer access the database to read the most frequently used BOMs and will read that information directly from the shared memory buffer.

This setting can generally improve the MRP performance if the same BOM is used several times to generate planned orders during the MRP run or if the same material is frequently planned during the day.

Warning

SAP does not recommend frequent changes into this indicator because the BOM timestamps in the buffer might become inconsistent. If it is necessary to switch this indicator off and on again, we should run program RMMDBOM1 to delete the BOMs from the buffer.

4.2 MRP Group

In the previous section, we analyzed all the MRP customizing settings that can be defined at the plant level. On the same plant, however, we may have a variety of different planning scenarios and groups of materials that may require different settings. For example, the rescheduling horizon for materials manufactured internally may be different than the rescheduling horizon of components purchased because we do not depend on the supplier to adjust the dates of a production order. Figure 4.25 shows an overview of the Customizing activities available in the MRP group Customizing.

If we want to define specific settings for a group of materials, we can create a new MRP group in Customizing and assign it in the **MRP 1** tab of the material master for all the materials that should share the same settings. In addition, we have MRP-group-specific settings that are not available in the **Overall Plant Parameters** Customizing activity. The creation of MRP groups is not mandatory, but it does improve the material master maintenance process and gives us more flexibility when defining the MRP Customizing settings.

Tip

Usually we need to assign the MRP group to the material master for the desired materials. However, if the MRP group key matches the product type key, this MRP group will be automatically considered by MRP. For example, if we create the FERT MRP group in Customizing, MRP will use it for all the FERT materials for which there is no MRP group assigned in the material master.

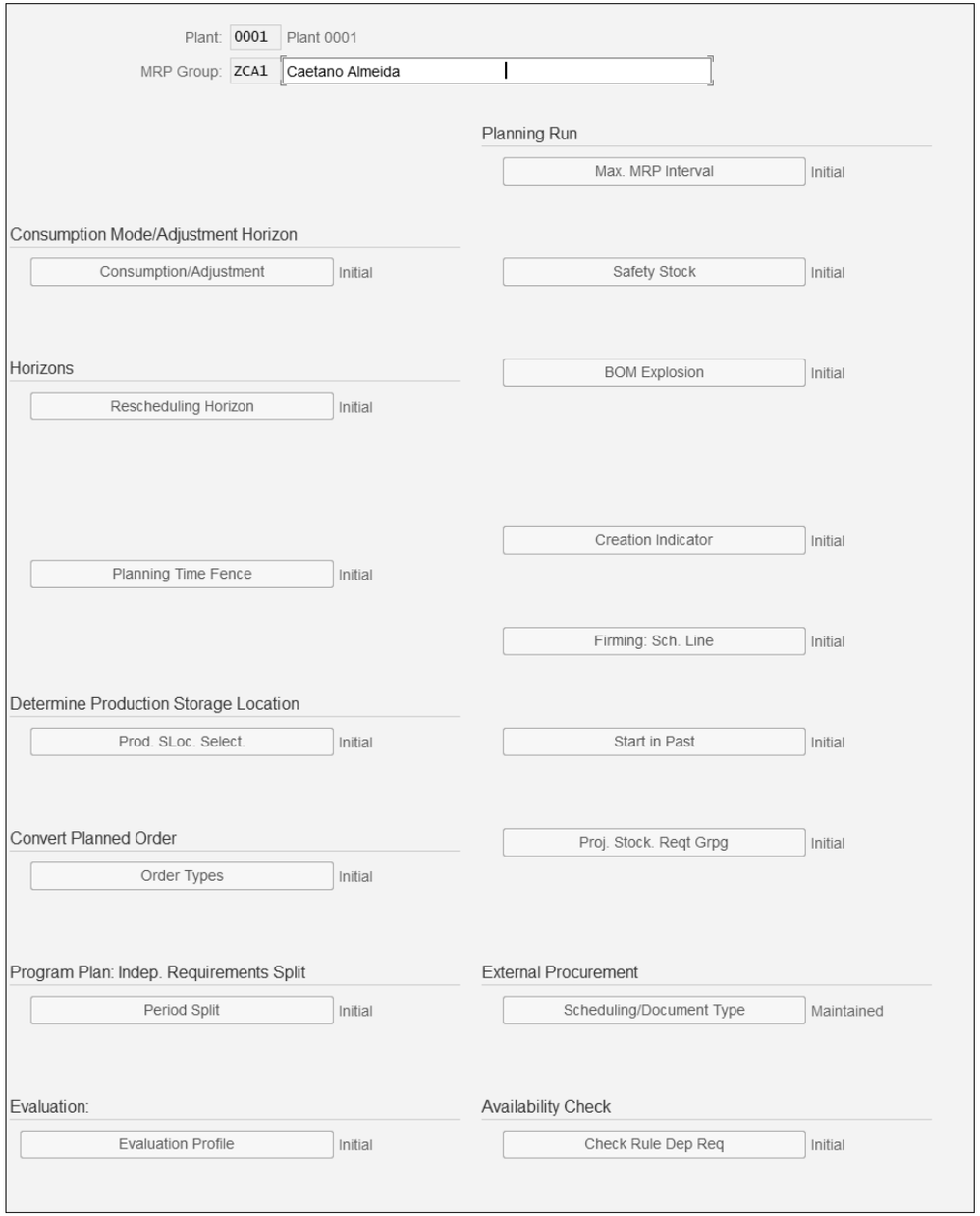


Figure 4.25 MRP Group Customizing

Some of the settings defined for the MRP group are also fields available in the material master, such as **Consumption Mode** and **Consumption Horizons for Independent Requirements**. When we assign an MRP group to the material master and we also define values for those fields in the material master, the values defined in the material master will have a higher priority.

4.2.1 Consumption Mode/Adjustment Horizon

Under the **Consumption Mode/Adjustment Horizon** section, we will find MRP group settings related to the PIRs. Here, we will find a single activity: **Consumption/Adjustment**.

In the **Consumption/Adjustment** activity, we can determine the values for the **Consumption Mode**, **Consumption Periods**, **Adjustment Period**, and **Adjustment Indicator** fields, as shown in Figure 4.26. These settings will influence the independent requirements consumption and reduction, defining if PIRs before or after a requirement can be consumed and the horizon within they can be consumed. We will see the planned independent requirements (PIRs) and how those settings will influence the PIR consumption in Chapter 9.

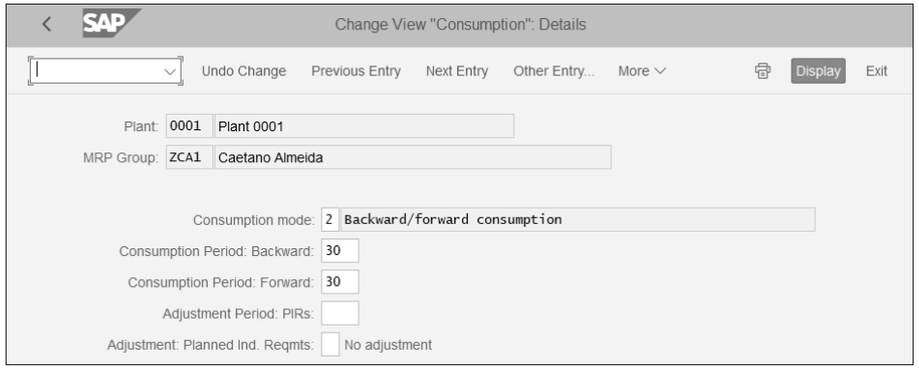


Figure 4.26 PIR Consumption Settings in the MRP Group

4.2.2 Horizons

In the MRP group, we will have Customizing activities to maintain MRP group-specific horizons, such as a rescheduling horizon or a planning time fence. Let's look at both.

Rescheduling per MRP Group

We discussed in the previous section that we can define a rescheduling horizon, tolerance values, and which specific planning elements will be considered during the rescheduling check in the **Overall Plant Parameters** Customizing activity.

At the MRP group level, we can define a different rescheduling horizon and tolerance values, but the option to select which elements will be considered during the rescheduling check is not available here, as shown in Figure 4.27.

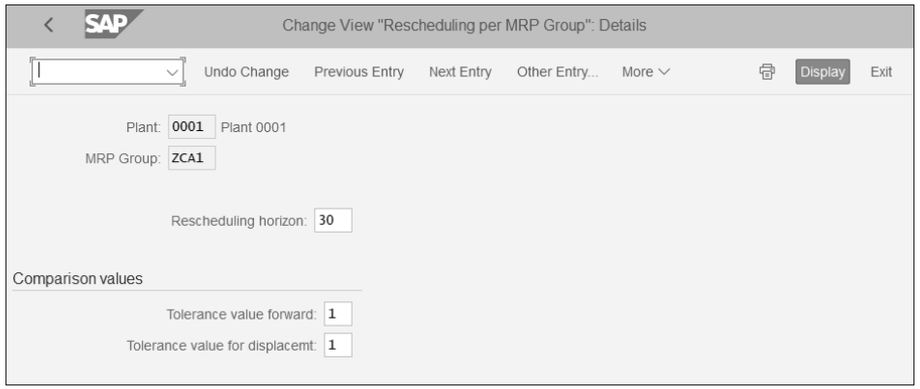


Figure 4.27 Rescheduling per MRP Group

Time Fence

When discussing the MRP types in Chapter 3, we noted that some MRP types will have a firming type, which allows planned orders to be automatically firmed within a predefined period called a time fence. We have the option to set the time fence directly in the material master, but we can also set a planning time fence (**Pl. Time Fence**) setting at the MRP group level, as shown in Figure 4.28.

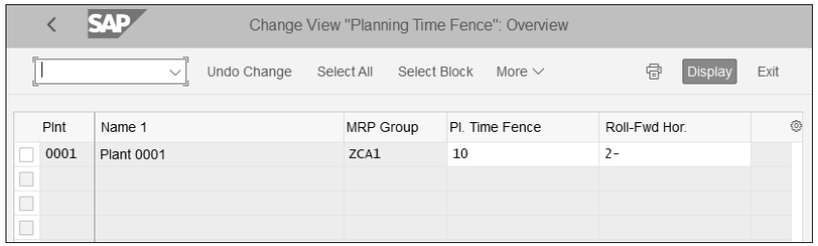


Figure 4.28 Planning Time Fence Customizing

The time fence maintained in the material master will always have a higher priority, which means that MRP will only consider the MRP group time fence when that field is empty in the material master. It will only be considered by materials for which an MRP with firming has been set.

One of the problems that may happen when we are using a time fence to automatically firm planned orders is that our planned orders will not be touched by MRP when they are within the time fence because they are firmed. In a capacity overload situation, this means we might not be able to convert all the planned orders to production orders, and those planned orders might be accumulated in the past. To avoid this kind of situation, we can define a roll-forward horizon. MRP will be able to delete firm planned orders before this given period.

The roll-forward horizon is a period of workdays and can be maintained in the past or in the future. For example, if we want to allow MRP to delete firm planned orders two days or more in the past, we should set the **Roll-Forward Horizon** value to -2, as shown in Figure 4.28.

Note

Planned orders will only be deleted if in the MRP type Customizing we have defined the **Delete Firm Planned Orders** option. (Those orders will only be deleted if they are no longer necessary.)

4.2.3 Determine Production Storage Location

In the MRP group Customizing, we have the option to define which logic will be used to determine the production storage location for the planned order components under the **Production Storage Location Selection** Customizing activity.

Production Storage Location Selection

During the BOM explosion, MRP can determine an issuing storage location for the planned order components. This storage location can be defined directly in the BOM item and will be copied to the planned order.

However, there are additional alternatives to select the storage location for a planned order component when it is blank in the planned order. Using the **Production Storage Location Selection** setting, we can choose one of the following strategies to select the component storage location:

1. MRP will check if the storage location is defined in the component material master only.
2. MRP will use the issue storage location defined in the assembly production version. If it is empty, MRP will use the assembly production storage location defined in the material master.
3. If no storage location has been defined for the component, MRP will first use strategy 1 and then use strategy 2.
4. If no storage location has been found for the assembly, MRP will first use strategy 2 and then use strategy 1.

4.2.4 Convert Planned Order

We can also determine default values for the order types at the MRP group level in the **Conversion** Customizing activity.

Conversion

Under the **Conversion** Customizing activity, we can define default order types for the conversion of planned orders to production or process orders. This is similar to the **Conversion** Customizing activity that was available in the **Overall Plant Parameters** Customizing options and was discussed in Section 4.1. However, the order types maintained at the MRP group level will have a higher priority than the settings maintained at the planned order level.

4.2.5 Program Plan: Independent Requirements Split

Besides the settings related to the PIR consumption and adjustment, we can also determine specific settings for the independent requirements split at the MRP group level under the **Period Split** Customizing activity.

Period Split

When working with PIRs, the values are usually created in monthly buckets for the materials. However, these values can be split into weekly or even daily buckets in order to smooth out production and allow MRP to generate more planned orders with a smaller quantity, instead of a single planned order for the whole month.

This automatic split can be carried out automatically when we are creating PIRs using a reference, such as the SOP planning. In the **Period Split** Customizing activity, we will

define how exactly this period will be split. In this Customizing activity, we will select a period split and define the number of weeks that should be split into days and the number of weeks that should be split into weekly requirements.

Note

The period split defined in this Customizing activity should be previously created in the customizing Transaction OMPH.

4.2.6 Evaluation

The MRP group also offers settings related to the evaluation of the MRP results, in the **Evaluation Profile** Customizing activity. We will discuss this activity in Chapter 5.

4.2.7 Planning Run

Most of the MRP group settings are related to the MRP planning run. In the following sections, we will go over each planning-run-related setting in detail.

Maximum MRP Interval

Materials will be selected to be planned by MRP according to the planning file entries, and the planning file entry will be updated for a material whenever there is a planning relevant change for this material. However, there are situations in which we want a material to be planned regularly by MRP despite missing planning file updates. In this kind of situation, we can use the **Maximum MRP Interval** setting in the MRP group to define that a material will be planned at regular intervals, as shown in Figure 4.29.

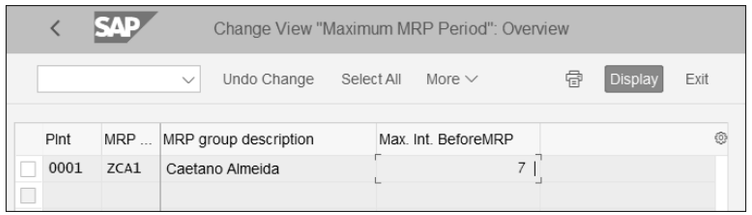


Figure 4.29 Maximum MRP Interval

This setting is generally used with classic MRP if we need to generate purchase requisitions in the opening period only. For example, if a planned order was generated outside the opening period and there was no MRP-relevant change for this material until it reached the opening period, this material would not be planned again by MRP and the planned order would not be replaced by a requisition.

Another usage of this setting is when we are working with MRP Lists in classic MRP and we want to ensure that they are updated at regular intervals. As noted earlier in this chapter, some goods movements may not mark the planning file if they are posted with a reference, so the MRP List may show a sales order or a reservation that is no longer relevant to MRP.

Using a maximum MRP interval, we can ensure that this material will be planned at regular intervals, planned orders will be replaced by requisitions when they reach the opening period, and the MRP List will be constantly updated.

Note

The maximum MRP interval will be only considered for materials for which the **Plan Regularly** setting is checked in the MRP type.

Safety Stock

In Chapter 3, we discussed how to define a safety stock in the material master and how this safety stock is considered by MRP during the planning run. In addition, we have seen that a share of this safety stock can be considered by MRP as available in order to avoid the creation of a new replenishment proposal just to cover a small part of the safety stock, reducing the procurement costs and only generating a new replenishment proposal when there is a relevant shortage.

This share of the safety stock available for planning is defined at the MRP group level under the **Safety Stock Availability** Customizing activity, shown in Figure 4.30. The number defined in this Customizing activity is a percentage. If the shortage quantity is below this percentage of the safety stock defined for the material, a new replenishment proposal will not be created.

Figure 4.30 Share of Safety Stock Available for Planning

BOM Explosion

Under the **BOM Explosion** Customizing activity, we can choose if we want to keep the same settings defined at the plant level for the **Explosion Date** and **Exclude Bulk Materials** settings. We can choose the same options available for the **BOM Explosion** settings at the plant level, and these settings will have a higher priority—or we can explicitly choose to consider the setting at the plant level, as shown in Figure 4.31.

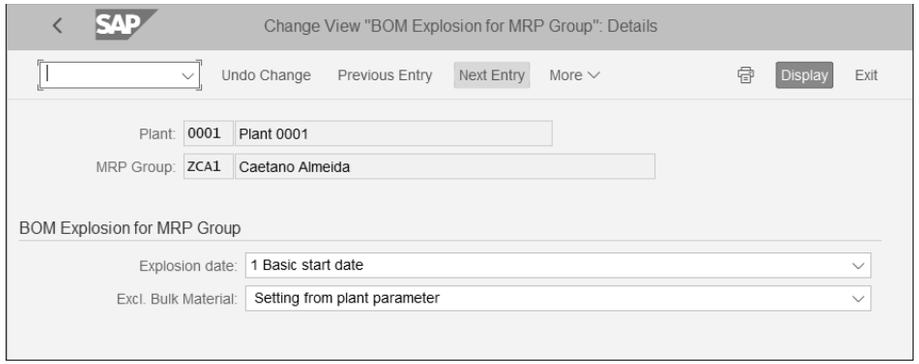


Figure 4.31 BOM Explosion for MRP Group

Creation Indicators

When we are scheduling the classic MRP planning run, we have the option to select the creation indicators and to choose if we want MRP to create planned orders or purchase requisitions for externally procured materials, if MRP should create MRP Lists, and if MRP should create schedule lines or not. The creation indicators defined in the MRP selection screen are relevant for all the materials planned during that planning run, but we might have different settings for particular sets of materials. In this case, we can define different creation indicators at the MRP group level, and they will be considered by MRP when planning materials belonging to this MRP group.

Under the **MRP Creation Indicators** Customizing activity, we can define default values for the **Create Purchase Requisitions**, **Create MRP List**, and **Schedule Lines** indicators, as shown in Figure 4.32.

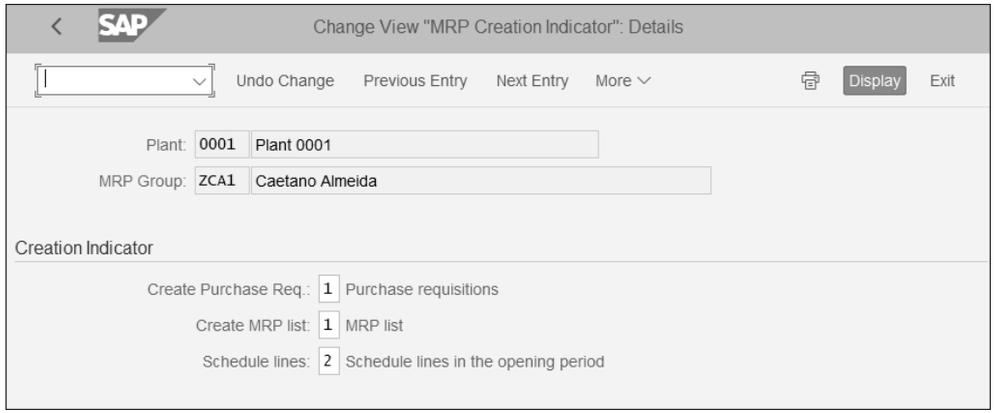


Figure 4.32 MRP Creation Indicators Customizing

Note

These indicators are considered by classic MRP only. MRP Live will not create MRP Lists and will create purchase requisitions and schedule lines by default. Also, this setting will be only relevant in the total planning transactions, such as Transactions MD01 and MD40 or when running MRP as a background job. In the single-item MRP transactions, such as Transaction MD02 or MD03, the creation indicators entered in the selection screen will still be considered.

Firming: Schedule Lines

The **Firming: Schedule Lines** Customizing activity provides a checkbox to define when the schedule lines will be considered firmed by MRP. Using this setting, we can ensure that only schedule lines that were already transmitted to the vendor will be considered firmed by MRP.

Start in the Past

This is the same **Start in the Past** setting available in the **Overall Plant Parameters** Customizing area. Here, we can choose if materials using this MRP group will follow

the value defined at the plant level or if they will always allow or never allow the start of a replenishment proposal in the past.

Project Stock Requirements Grouping

MRP supports planning under different types of individual stocks, such as the sales order individual stock or the project/WBS individual stock. When working with project planning, we will generally have different WBS elements under the same project, and each WBS element will have its own special stock. Therefore, components assigned to WBS element A will be planned separately from components assigned to WBS element B, even if they belong to the same project.

We might, however, want to plan those components together, under the same WBS element. If the same component is required for different WBS elements, we can plan all those requirements together and generate a single replenishment proposal to cover them in order to reduce the purchasing costs. In this case, we need to set the **Grouping** flag under the **Project Stock Requirements Grouping** Customizing activity, as shown in Figure 4.33, in order to activate this feature and allow MRP to group requirements from different WBS elements belonging to the same project.

Figure 4.33 Requirements Grouping for Project Stock

> **Note**
>
> Besides this setting at the MRP group level, there are additional settings required at the project level, such as the activation of the automatic requirement group in the project definition and the selection of the grouping WBS elements at the WBS element level.

4.2.8 External Procurement

We can maintain settings related to the creation of replenishment proposals with external procurement in the **External Procurement Scheduling/Document Type** Customizing activity.

External Procurement Scheduling/Document Type

In SAP ERP, we could choose if an externally procured replenishment proposal would be scheduled with the planned delivery time from the material master or if the planned delivery time maintained in the info record or in the scheduling agreement would be considered. That system behavior was controlled by a Customizing setting under this Customizing activity, but this behavior was changed in SAP S/4HANA. Now, a replenishment proposal will be automatically scheduled with the planned delivery time maintained for the info record or agreement. The planned delivery time from the material master will be only considered if a source of supply could not be selected for the replenishment proposal or if the planned delivery time in the selected source of supply is empty.

What we can *still* do in this Customizing activity is to select the document types that will be used by MRP to generate different purchase requisition types. Here, we will be able to choose the purchase requisition types used for standard requisitions, subcontracting requisitions, or stock transfer requisitions. In the example shown in Figure 4.34, we have defined a custom purchase requisition type to be used in a subcontracting scenario, so MRP will always generate purchase requisitions of type ZNB for materials assigned to this MRP group and with a subcontracting special procurement type.

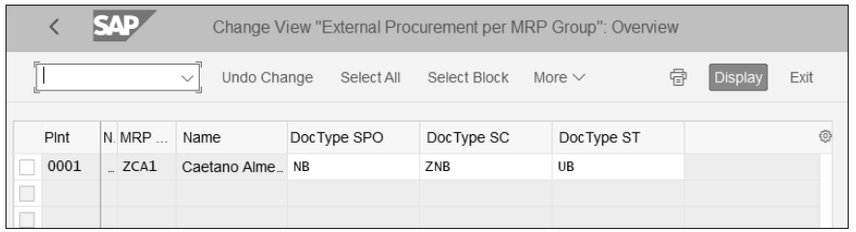


Figure 4.34 External Procurement Document Types Customizing

4.2.9 Availability Check

Finally, the MRP group also offers settings related to the planned order availability check, as you can see in the **Checking Rule for Dependent Requirements** Customizing activity.

Checking Rule for Dependent Requirements

This Customizing activity is similar to the **Dependent Requirement Availability** activity, which is available under the **Overall Plant Parameters** section. Here, we can select which checking rule will be used during the planned order availability check.

However, as shown in Figure 4.35, there is an additional **Activate Full Confirmation Logic** flag here. When this flag is not checked, the availability check will confirm the planned order components' available quantity proportional to the component with the lowest confirmed quantity. If this flag is checked, however, the confirmed quantity of each component is determined independently, so we can confirm the full available quantity of each component even if there are components for which we could not determine a confirmed available quantity.

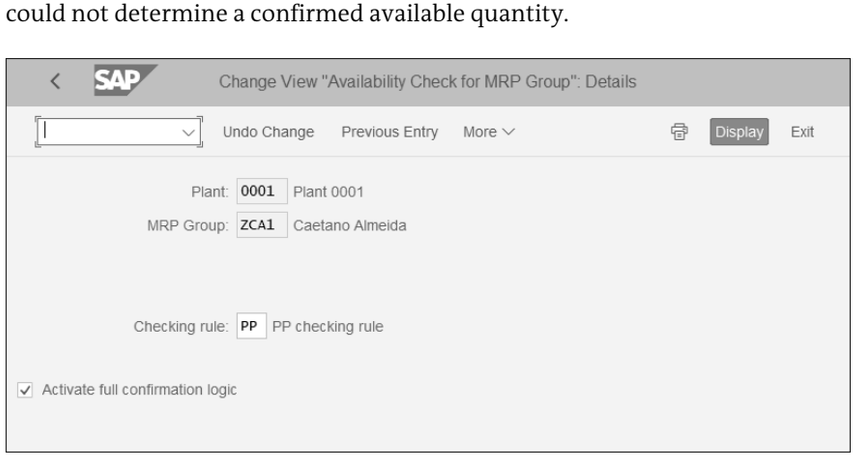


Figure 4.35 Availability Check Customizing

4.3 MRP Type

We discussed the standard MRP types in detail in Chapter 3, and those MRP types will cover most of our business requirements. However, there are some Customizing settings behind the MRP types that can be changed to influence the MRP behavior.

Whenever we need to change any setting in the MRP types, we should copy one of the existing standard MRP types and change the desired settings, generating a custom MRP type.

The transaction to change the MRP type Customizing is Transaction OMDQ. When we enter this transaction, we will see a list of the existing MRP types. When we access the details screen of the MRP type, we will see all the settings that can be changed for the MRP type, as shown in Figure 4.36.

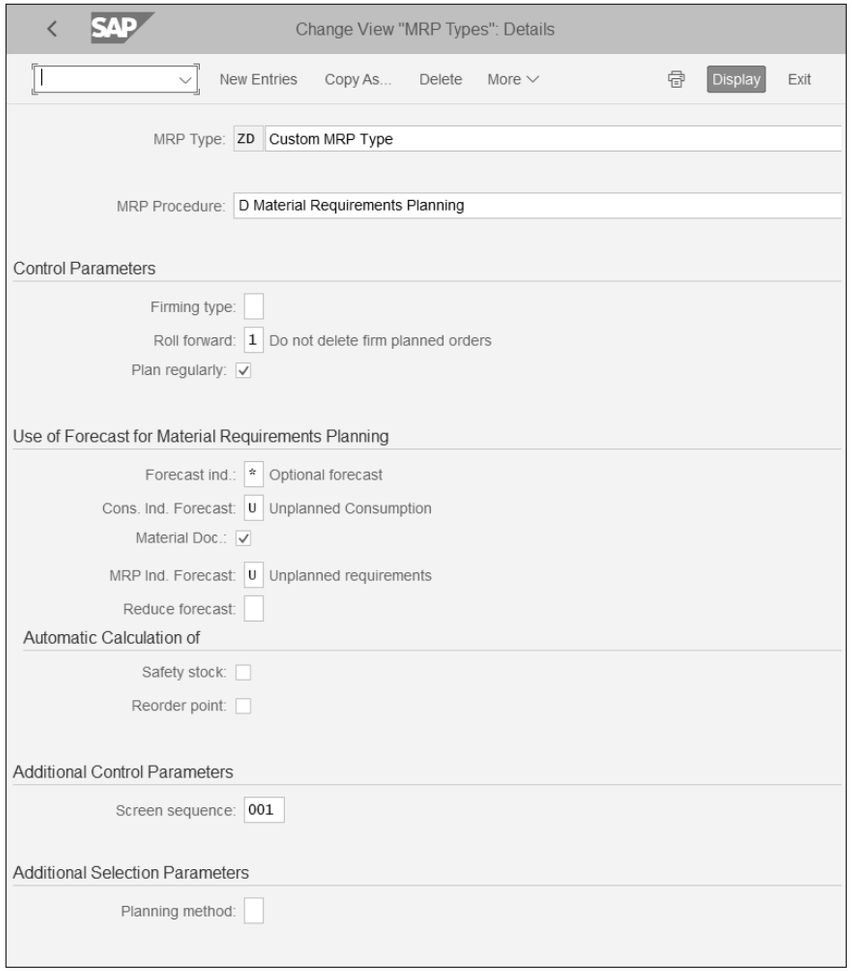


Figure 4.36 MRP Type Customizing

We discussed the **Firming Type** setting in detail in the previous chapter; this setting usually doesn't need to be changed because SAP offers MRP types for each of the existing firming types.

Earlier in the chapter, we described how to define a roll-forward horizon at the MRP group level and noted that MRP can delete planned orders before this horizon. To activate the deletion of planned orders, we need to set the **Roll Forward** setting to the **Delete Firm Planned Orders** value in the MRP type Customizing. This way, we can have two levels of control for the deletion of planned orders: the MRP group and the MRP type.

We have also discussed that we can define an interval for regular MRP executions in the MRP group Customizing, even when the planning file flags are not checked. If the **Plan Regularly** setting is checked in the MRP type, then a material will only be planned in those intervals.

In the MRP type Customizing, we also have settings to control the usage of forecasts by MRP. The forecast indicator (the **Forecast Ind.** field) is generally used to make the forecast mandatory for forecast-based MRP types. We can also choose whether the forecast will be optional or if there will be no forecast, whether forecast requirements will be consumed (using the **Consumption Indicator for Forecast** setting), and whether MRP will consider the forecast requirements (using the **MRP Indicator of Forecast** setting). Finally, we can control the reduction of forecast requirements using the **Reduce Forecast** setting.

The **Material Documents** indicator is a new feature introduced in SAP S/4HANA. With this setting, the forecast will use the material documents from table `MATDOC` directly to calculate the forecast, instead of using the aggregated consumption values from tables `MVER` and `DVER`. The idea behind this setting is to prevent locks in the material master when updating the consumption values in the material master.

Note

This setting cannot be used for a forecast with period P. More details about this feature can be found in SAP Note 1929000 (MP38: Material Forecast based on Material Documents).

In the MRP type Customizing, we can also define the automatic calculation of the reorder point or the MRP type, setting the **Safety Stock** and **Reorder Point** flags, respectively. These flags are set, for example, for the standard MRP type V2, as explained in the previous chapter.

In the MRP evaluation transactions, such as the Stock/Requirements List, in the header details section, we can find several tabs with additional information about the material and the MRP-related settings. Depending on the MRP type, a different sequence of screens and different fields can be displayed, and we will control which screens will be shown using the **Screen Sequence** setting. For example, for a material with a reorder point MRP type, it makes sense to show information related to the reorder point, but this field is not relevant for a material with a deterministic MRP type.

Note

The **Screen Sequence** setting must be previously defined in the customizing Transaction OMIO. We can choose from among the standard screens available for program SAPLM61K or we can create custom screens for this program and select them.

The **Planning Method** indicator is only used for materials planned externally, and it will not affect the MRP logic. It is generally used by MRP type XO or similar MRP types.

If we select an MRP procedure with a reorder point MRP type, we will see additional fields that are only relevant if we are using the reorder point logic. We noted in Chapter 3 that the standard MRP type VB will not consider external requirements and that MRP type V1 can consider customer requirements within the replenishment lead time. We can control how these external requirements will be considered by a reorder point MRP type using the **Include External Requirements** setting. Besides the options already mentioned, we can create a custom MRP type that will consider external requirements in the total horizon. We also have settings to select additional MRP elements to be considered as external requirements, as shown in Figure 4.37.

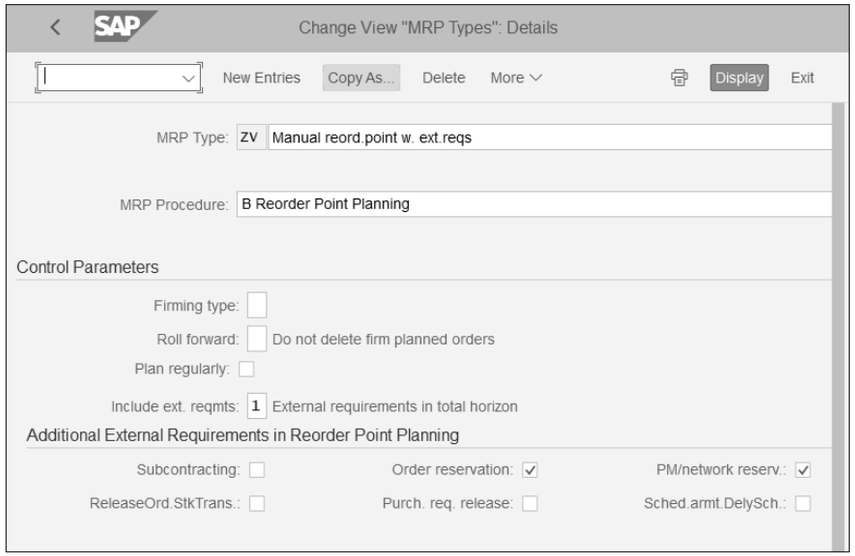


Figure 4.37 MRP Type Customizing for a Reorder Point MRP Procedure

4.4 Lot-Sizing Procedure

We discussed how to use the standard lot-sizing procedures in the previous chapter and the effects of additional material master settings in the calculation of the replenishment proposal quantities. Very frequently, however, we need to create a custom lot-sizing procedure to make changes to the standard lot-sizing procedure settings.

To create or change a lot-sizing procedure, we use customizing Transaction OMI4. When we enter this transaction, which is shown in Figure 4.38, we can choose the **MRP Lot Size** button (to define the general lot size settings) or the **Storage Costs Indicator** button (which is used for the optimum lot-sizing procedures).

We can find the most important settings under the **MRP Lot Size** section, shown in Figure 4.39. The first setting that we can change in our custom lot-sizing procedure is the **Last Lot Exact** flag, which was mentioned in the previous chapter. We can use this setting when we want to use a fixed lot-sizing procedure so that the replenishment proposals will always be created with a fixed quantity, but we want to have the last replenishment proposal created with the exact quantity. This can avoid an unnecessary remaining quantity in stock.

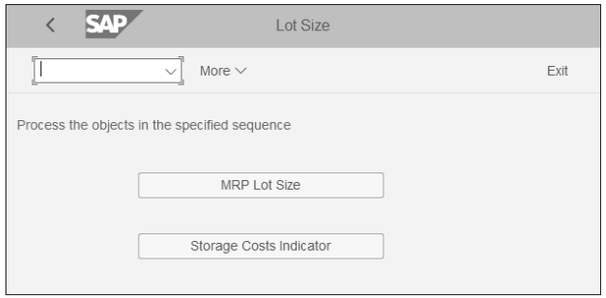


Figure 4.38 Lot Size Customizing

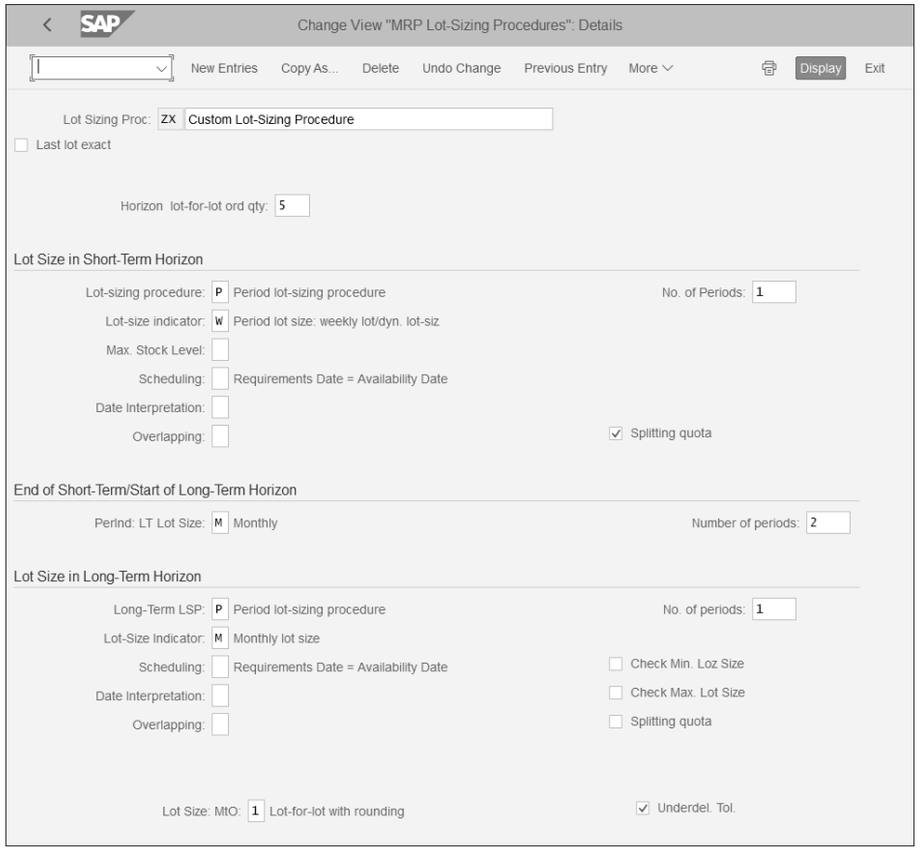


Figure 4.39 MRP Lot-Sizing Procedure Customizing

In the lot-sizing procedure Customizing, we have the option to define different lot-sizing procedures for the short-term and for the long-term horizon. In addition, by using the **Horizon: Lot-for-Lot Order Quantity** field, we can define a small horizon before the short-term horizon, where the lot-for-lot logic will be used to calculate the replenishment proposal. This means that no matter which lot-sizing procedure is selected, if there is a shortage within this interval, then MRP will create a new replenishment proposal with the exact missing quantity.

In the **Lot Size in Short-Term Horizon** section shown in Figure 4.39, we can select a combination of the **Lot-Sizing Procedure** and **Lot-size Indicator** fields that will be used within the short-term horizon. We will choose static, period, or optimum lot-sizing procedures, discussed in Chapter 3.

When choosing a **Period Lot-Sizing** indicator (P), we will also need to set the **Number of Periods** value to define for how many periods MRP will aggregate the requirements in order to calculate the replenishment proposal quantity.

Example

In the example shown in Figure 4.39, the number of periods is 1, so the lot-sizing procedure will aggregate requirements within one week to calculate the replenishment proposal quantity. If we want to aggregate requirements within two weeks, we should set the number of periods to 2.

The **Maximum Stock Level** setting is only relevant when we are using the **Replenish to Maximum Stock Level** indicator. With this setting, we can choose if MRP will calculate the maximum stock level before or after covering all the requirements.

When we are using period lot-sizing procedures, we can use the **Scheduling** setting to determine when the replenishment proposal will be created. We have the following options available for this setting:

- Availability date equal to requirement date (**Requirements Date = Availability Date**): MRP will create a planned order with the availability date equal to the first shortage date within the period.
- Availability date at period start (**Period Start = Availability Date**): A new planned order will be created with the availability date equal to the period start. For example, when using a weekly lot-sizing procedure, a planned order will be created with the availability date on the first day of the week.

- Availability date at period end (**Period End = Availability Date**): A new planned order will be created with the availability date equal to the period end.
- Start date at period start (**Period Start = Start Date / Period End = Availability Date**): MRP will create a planned order with the start date equal to the period start.
- Planned order start date at period start and availability date at period end (**Period Start = Start Date**): With this setting, MRP will schedule the planned order to match the period start and finish, and the in-house processing time in the material master record will be ignored.

When we are using a goods receipt processing time in our material, we will have a delivery date and an availability date. The delivery date is the date on which the actual goods receipt happens, while the availability date is when the material is available to be used (in other words, the delivery date plus the goods receipt processing time). With the **Date Interpretation** indicator, we can control if a period lot-sizing procedure will consider the availability date or the actual delivery date in the scheduling calculation.

The **Overlapping** indicator can be used to avoid the creation of several planned orders on the same date if we are using, for example, a fixed lot-sizing procedure or a maximum lot size. MRP will use the value defined in the **Takt-Time** field of the material master to set an interval between the different planned orders created to cover the same shortage. We can define in Customizing that this overlapping will be forward or backward.

The **Splitting Quota** setting is relevant when we are using quota arrangement and we want to split the quantity of each shortage between the different sources of supply according to the shortage quantities. The effects of this setting in the MRP results were explained in detail in Chapter 3.

As mentioned earlier in this section, we can have different lot-sizing logic for the short-term horizon and for the long-term horizon. The **End of Short-Term/Start of Long-Term Horizon** section will define the duration of the short-term horizon. Here, we need to enter the period indicator (the **PerInd** field) and for how many periods the short-term horizon should last.

Under the **Lot-Size in Long-Term Horizon** section, we have basically the same options available for the short-term horizon. In addition, we use the **Check Minimum Lot Size** and **Check Maximum Lot Size** flags to determine if the minimum or the maximum lot size will be considered in the long-term horizon, respectively.

Note

The idea behind different lot-sizing procedures for the short-term and for the long-term horizon is usually to minimize the number of replenishment proposals generated in the long term, reducing the noise for the MRP controller because we will not need such detailed planning in the long-term horizon.

When we are working with MTO or MTP scenarios, we will usually procure the exact missing quantity to avoid a remaining quantity assigned to the sales order stock or to the project stock. Therefore, the standard behavior is to use the lot-for-lot logic, despite the lot sizing for MTO and MTP. However, this is not always the case, and we might have to use a lot-sizing procedure to procure additional quantities even for MTO and MTP. In this case, we can use the **Lot Size: MTO** field to determine whether MTO and MTP will use a lot-for-lot logic with rounding or if the same lot-sizing procedure selected for the short-term horizon will be used.

Finally, another important setting for the MTO scenario is the **Underdelivery Tolerance** flag. This setting was part of the Discrete Industries and Mill Products industry solution in SAP ERP and it is now available by default in SAP S/4HANA. When this flag is checked, MRP will not generate a new replenishment proposal if the sales order stock plus replenishment proposals are within the underdelivery tolerance defined in the sales order. This setting will be considered not only for the sales order, but also for the lower-level elements assigned to the sales order special stock.

4.5 Availability Check

The availability check is a feature used to determine whether the components of a planned order will be available and to determine a committed date and committed quantity for a planned order.

Earlier in this chapter, we described several Customizing activities in which we need to enact a checking rule, either for dependent requirements or for backorder processing. This checking rule will be used in combination with the availability check maintained in the **MRP 3** tab of the material master to determine the scope of the availability check. It is in the scope of the availability check, in which we will define which stocks can be considered available and which requirements or future receipts can also be considered in the availability check.

The availability check Customizing for planned orders can be accessed directly in Transaction OPPJ. Here we can create a new checking rule, determine the check, and assign a checking rule to the plant or to the MRP group.

When we select the **Determine the Check** option, we will be able to choose a specific checking rule and availability check combination and define specific **Availability Check** settings. Figure 4.40 shows the details of this Customizing activity, with the following sections:

- Under the **Stocks** section, we can determine which stock types are considered available, such as safety stock, stock in transfer, or blocked stock.
- In the **Future Supply** section, we can determine which types of receipts in the future will be considered available, such as purchase requisitions, purchase orders, shipping notifications, planned orders, or production orders.
- The **Delayed Supply** section allows us to determine if supply elements in the past will be considered or not and if a message should be displayed to the user to confirm delayed supplies.
- Under the **Requirements** section, we will determine which additional requirements should be considered during the calculation of the availability check.
- The **Replenishment Lead Time** checkbox allows us to determine if the availability should be confirmed at the end of the replenishment lead time, if it cannot be confirmed with existing stocks and future receipts.
- In the **Special Scenarios** section, we can determine whether the availability check will be restricted to the storage location and if it will consider subcontracting stock and requirements.
- In the **Missing Parts Processing** section, we need to enter a period in the future in which the system will check for a goods receipt that is missing parts. A workflow can be used to trigger an email whenever a goods receipt is posted to the MRP controller for a missing part within this period.

Note

These settings will be only considered when we run the availability check, for example, for a planned order. They will not affect the MRP results or the information displayed in the Stock/Requirements List.

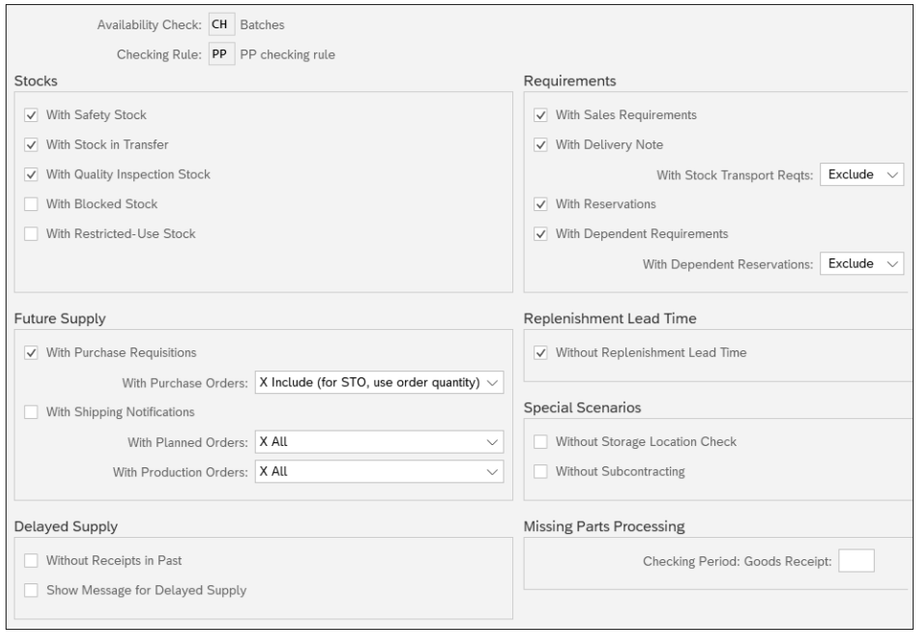


Figure 4.40 Scope of the Availability Check

4.6 MRP Areas

MRP areas were already available in SAP ERP, but their usage became mandatory in SAP S/4HANA so that users could segregate the subcontractor stock for the plant and either plan a storage location separately or exclude it from MRP. Therefore, during a migration to SAP S/4HANA or during a new implementation, we will need to create MRP areas in Customizing.

An *MRP area* is basically an organizational unit that is planned independently by MRP. The Customizing transaction to create or change MRP areas is Transaction OMIZ. There are three types of MRP areas:

- Plant (01): The plant MRP area is created automatically by the system and we cannot change it in Customizing. It is a 1:1 relationship, where each MRP area will refer to one specific plant.
- Storage location (02): It needs to be created manually when we need to plan a storage location separately. A storage location MRP area may refer to one or more

storage locations under the same plant. A storage location, however, can only belong to a single MRP area.

- Subcontractor (03): The subcontractor MRP area represents a vendor involved in the subcontracting scenario. It requires a 1:1 assignment, where each MRP area will refer to a single vendor a vendor can only belong to one MRP area.

In SAP ERP, we had to first activate the usage of MRP areas in Customizing and then to convert the planning file entries. These steps are no longer necessary in SAP S/4HANA because MRP areas are already active by default, so we can directly create MRP areas in Transaction OMIZ.

When we first enter the MRP areas Customizing, we will see all the plant MRP areas already created. If there are storage location or subcontracting MRP areas created, they will also appear in the **MRP Area Overview** screen, as shown in Figure 4.41.

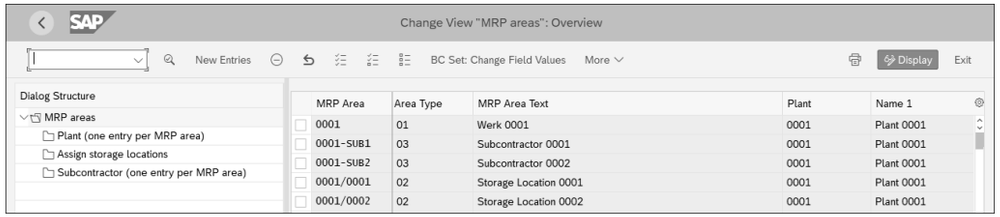


Figure 4.41 MRP Areas Overview

By clicking the **New Entries** button, we will jump into a new screen, where we will set the MRP area name, description, MRP area type, and plant in the corresponding fields. Figure 4.42 shows the details of the creation of a new storage location MRP area, with MRP area type 02.

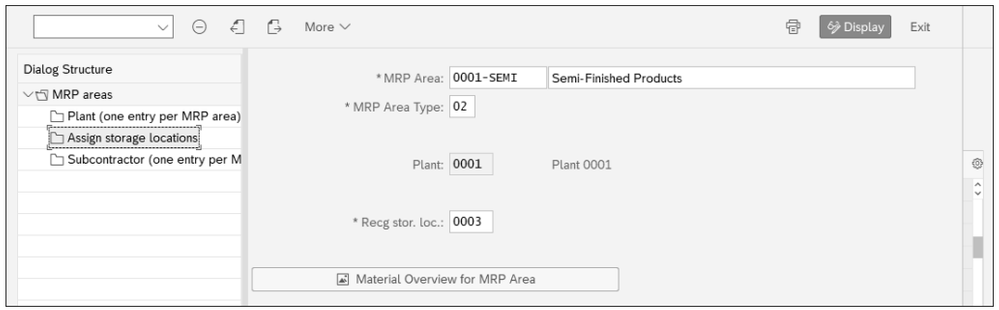


Figure 4.42 Creation of a New Storage Location MRP Area

After confirming the data input, a new field will appear on the screen: **Receiving Storage Location**. This would be the storage location where the components will be received into the MRP area; it needs to be one of the storage locations belonging to this MRP area. This assignment will be automatically created when we enter the receiving storage location.

If we need to include additional storage locations in our MRP area, we can select the **Assign Storage Locations** option in the menu located on the left side of the screen. Figure 4.43 shows the assignment of multiple storage locations to the MRP area.

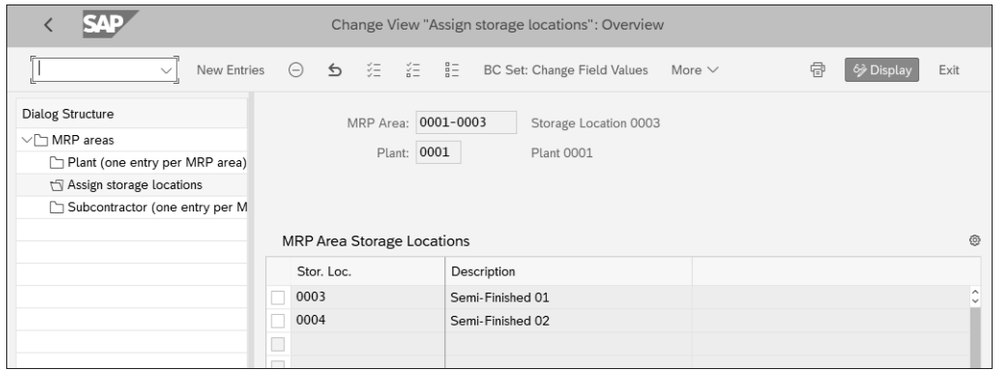


Figure 4.43 Assignment of Multiple Storage Locations to the MRP Area

If we are creating a subcontracting MRP area, the process is almost the same. The main differences are that we won't see the field to define the storage location, as shown in Figure 4.44, and that we will need to select the **Subcontractor** option from the left-hand menu in order to assign a vendor to the subcontracting MRP area.

As discussed earlier, we can only assign a single subcontracting vendor to the subcontracting MRP area, and each vendor can be only assigned to one MRP area. Figure 4.45 shows the assignment of the subcontracting vendor SUBCON_001 to a subcontracting MRP area 0001-SUB1 in Customizing.

While the creation and the transport of a storage location MRP area is a very simple process, an extra level of complexity is involved in the creation of a subcontracting MRP area because it is dependent on the vendor number. The storage location is *customizing data*, which means that the storage location number will be transported and the same number will be used across all the systems and clients. The vendor number, however, is *master data*, which means that the vendor number can be different across different systems and clients.

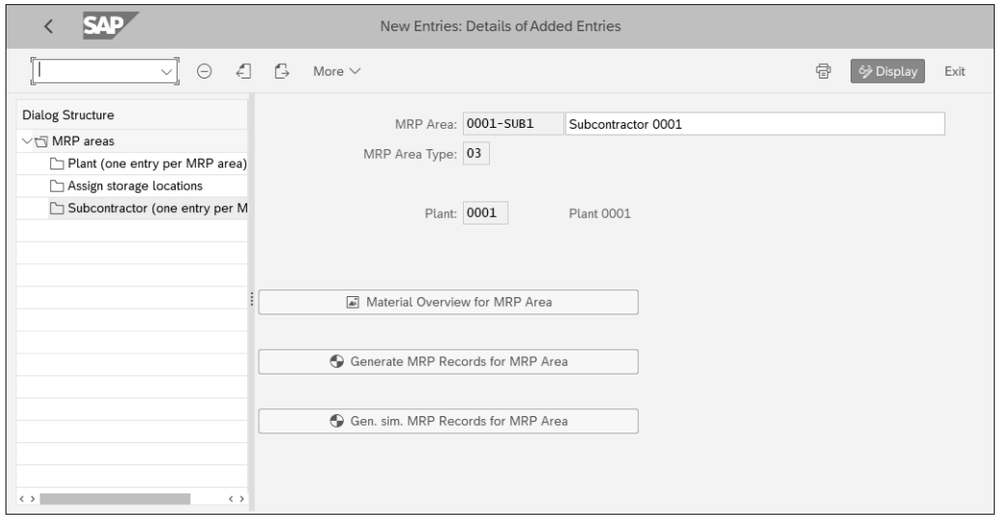


Figure 4.44 Creation of a Subcontracting MRP Area

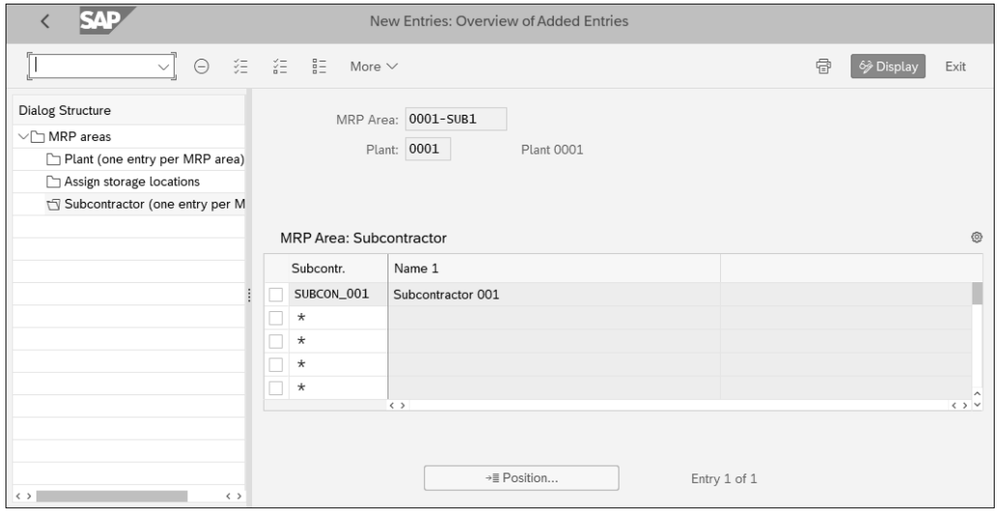


Figure 4.45 Subcontracting Vendor Assignment to the MRP Area

If we transport subcontracting MRP areas to a different system, we usually need to adjust the vendor number manually. To adjust the settings in the productive system, we would need to open this Customizing transaction to changes in the productive

system by changing the customizing objects to **Current Settings**. This is a procedure usually executed by the system administrator; SAP Note 317650 (Transporting MRP Areas between Systems) provides more information about it.

Warning

We can only adjust the vendor number in Customizing if the MRP area was not yet assigned to any material, so the adjustment should happen just after the MRP areas transport.

As of SAP S/4HANA 1909, SAP has delivered separate Customizing transactions for storage locations and subcontracting MRP areas. Transaction OMIZA will only access storage location MRP areas, and Transaction OMIZB will only access subcontracting MRP areas. The customizing Transaction OMIZB should be opened for changes in the productive system by default, so users will be able to create a new MRP area whenever a new vendor is created in the system.

Besides the creation of new MRP areas in Customizing, there are some situations in which we might want to delete MRP areas from Customizing. This is only possible, however, when there is no material master assignment made to the MRP area. As shown in Figure 4.42 and Figure 4.44, there is a **Material Overview for MRP Area** button available, which will open a list of all the materials assigned to this specific MRP area when clicked (see Figure 4.46). If we need to delete an MRP area, we can use this list of materials to check which material master assignments of the MRP area we need to remove.

In standard SAP S/4HANA, however, we can only set the deletion flag for a material master assignment to the MRP area. Setting the deletion flag is not enough to allow the deletion of the MRP area. In order to delete the MRP area, we need to physically delete the assignments from database table MDMA.

Because the feature to physically delete this assignment from the table is not available in SAP S/4HANA and there is also no archiving available, SAP offers report YMRPAREO, which can be implemented through SAP Note 54544 (Reorganization of Materials in MRP Areas) to delete the MRP area assignment. This report will delete all the MRP area assignments for which the deletion indicator has been already set. After the deletion of all the assignments for a specific MRP area, we can proceed with the deletion of the Customizing entry.

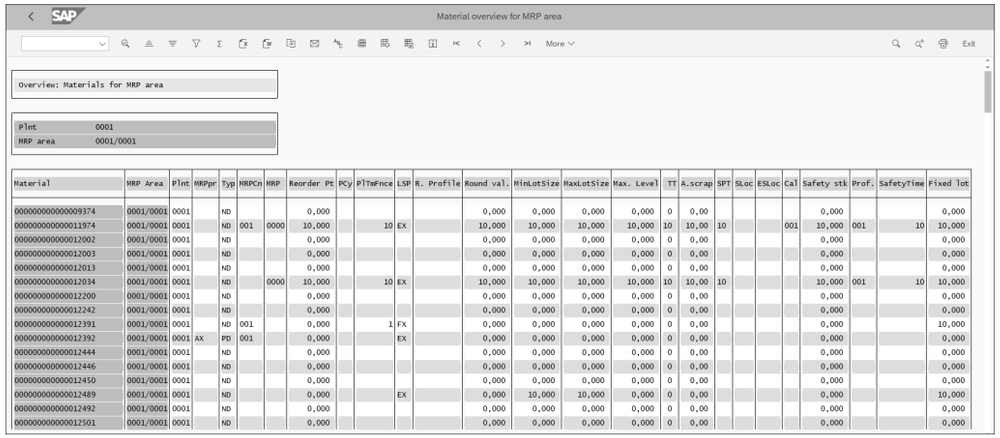


Figure 4.46 Material Overview for MRP Area

Tip

Report RMMDDIBE can be used initially to set the deletion flag for the material master assignments, and report YMRPAREO can be used in a subsequent step to physically delete the entries from table MDMA.

4.7 Parallel Processing

If we are using classic MRP, we can activate parallel processing to improve the MRP performance. With *parallel processing*, MRP splits the planning run into small packages of materials that can be processed in parallel. We can create several sessions in the same server, use different work processes under the same server, or trigger sessions in a different server by means of an RFC connection.

The activation of parallel processing in the planning run is simple: we just need to check the **Parallel Processing** flag in the MRP selection screen. However, before we can use this setting, we need to define the settings for parallel processing in Customizing.

This Customizing activity can be accessed through Transaction OMIQ. There, we just have to select the destinations (servers) for parallel processing and define the number of sessions allowed for each server, as shown in Figure 4.47.

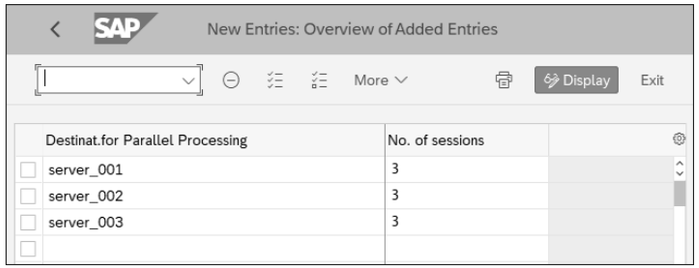


Figure 4.47 Destinations for Parallel Processing in Customizing

Before we can select the entries, we need to ensure that there are RFC connections available for each server to be selected. These connections must be maintained in Transaction SM59 as internal connections. Note that SAP S/4HANA does not allow the selection of a server group, and we need to define the individual servers as the destinations for parallel processing.

For technical reasons, each individual package is processed as a dialog process, so we need to ensure that the number of sessions does not exceed the number of dialog processes available in the server.

Warning

If we set a very high level of parallel processing, we might be consuming too many system resources. Therefore, we suggest that you discuss the parallel processing settings with your system admin before defining the servers and the number of sessions to be used.

An inconsistency in the parallel processing Customizing is a very common cause for terminations during the MRP run. If MRP cannot find the destination for parallel processing, a short dump may be triggered, and the planning run can be terminated. If this happens, we can check if the servers defined in Customizing for parallel processing are all up and running by comparing against instances available in Transaction SM51. In addition, in case the servers available in the system changes, we need to come back to Customizing and adjust the settings.

Very often, the servers defined in the development system are not the same as those defined in the quality or productive system. Therefore, just like the subcontracting MRP areas, we may have to adjust the Customizing settings in the productive system

after the Customizing entries transport. We can also set this Customizing activity to **Current Settings**, as explained in SAP Note 187253 (OMIQ: Not Possible to Maintain Destinations).

4.8 Summary

In this chapter, we have gone through all the basic MRP-related Customizing settings for overall plant parameters, the MRP group, the MRP type, the lot-sizing procedure, and the MRP areas. These settings should be reviewed in a newly created system, whenever we are creating a new plant for which MRP should be executed, or when we need to improve and optimize the MRP run. After implementing these Customizing settings in a system, we should be able to execute MRP in an SAP S/4HANA system and have new replenishment proposals to cover the shortages. Therefore, we will cover the MRP execution in the following chapter, including both classic MRP and MRP Live, as well as the different transactions and the SAP Fiori applications available in SAP S/4HANA to run MRP.

We will see the additional Customizing settings related to the MRP evaluation in Chapter 6 and advanced MRP settings in Chapter 8.

Contents

Preface 15

1 Introduction to MRP with SAP S/4HANA 19

1.1 MRP Basics 19

1.2 MRP within the Supply Chain in SAP Systems 20

1.3 MRP with SAP S/4HANA 24

1.3.1 Classic MRP 24

1.3.2 MRP Live 24

1.3.3 MRP Cockpit 25

1.3.4 Demand-Driven MRP 27

1.3.5 Predictive Material and Resource Planning 28

1.4 Summary 28

2 MRP Basics 29

2.1 MRP Procedures 29

2.1.1 Material Requirements Planning 30

2.1.2 Master Production Scheduling 31

2.1.3 Consumption-Based Planning 33

2.1.4 Demand-Driven MRP 34

2.2 The MRP Planning Process 35

2.2.1 Reading the Planning File 36

2.2.2 Calculating the Net Requirements 37

2.2.3 Calculating the Procurement Quantity 39

2.2.4 Determining the Replenishment Proposal Type 41

2.2.5 Scheduling Replenishment Proposals 43

2.2.6 Exploding the BOM 50
2.2.7 Creating Exception Messages 52
2.3 Summary 53

3 Master Data and Basic Settings 55

3.1 Material Master 56
3.1.1 MRP Type 62
3.1.2 Lot-Sizing Procedures 76
3.1.3 Procurement Types and Special Procurement Types 85
3.1.4 Scheduling Parameters 87
3.1.5 Net Requirements Calculation 90
3.1.6 MRP Area 93
3.2 Procurement Master Data 95
3.2.1 Internal Procurement 97
3.2.2 External Procurement 112
3.2.3 Quota Arrangement 121
3.3 Planning File 126
3.4 Summary 128

4 Configuring MRP 131

4.1 Overall Plant Parameters 132
4.1.1 Maintain Environment 134
4.1.2 Maintain Master Data 136
4.1.3 Maintain Planned Orders 141
4.1.4 Maintain Planning Run 142
4.2 MRP Group 158
4.2.1 Consumption Mode/Adjustment Horizon 160
4.2.2 Horizons 160
4.2.3 Determine Production Storage Location 162
4.2.4 Convert Planned Order 163

4.2.5 Program Plan: Independent Requirements Split 163
4.2.6 Evaluation 164
4.2.7 Planning Run 164
4.2.8 External Procurement 169
4.2.9 Availability Check 170
4.3 MRP Type 170
4.4 Lot-Sizing Procedure 174
4.5 Availability Check 178
4.6 MRP Areas 180
4.7 Parallel Processing 185
4.8 Summary 187

5 Running MRP 189

5.1 MRP Live versus Classic MRP 189
5.2 Classic MRP 193
5.2.1 Control Parameters 194
5.2.2 Single-Item/Single-Level Planning 197
5.2.3 Single-Item/Multilevel Planning 199
5.2.4 Single-Item Interactive Planning 202
5.2.5 Multilevel Sales Order/Project Planning 204
5.2.6 Total Planning Run 206
5.2.7 Master Production Scheduling 209
5.3 MRP Live 211
5.3.1 MRP Dispatcher 211
5.3.2 MRP Live Control Parameters 212
5.3.3 Running MRP Live in SAP GUI 214
5.3.4 SAP Fiori 216
5.4 Planning PP/DS Materials in MRP Live (One MRP Run) 221
5.5 Summary 223

6 Evaluating the MRP Results 225

6.1 Exception Messages 225
6.2 Rescheduling Checks 230
6.3 The Stock/Requirements List 235
6.3.1 Individual Access 236
6.3.2 Collective Access 254
6.4 MRP List 260
6.5 Information and Settings for Materials in MRP on SAP HANA 263
6.6 Order Report 264
6.7 Pegged Requirements 268
6.8 Evaluation of the Planning Situation 270
6.9 MRP Cockpit 272
6.9.1 Shortage 273
6.9.2 Accessing SAP Fiori Applications for MRP 275
6.9.3 Monitor and Manage Material Coverage 277
6.9.4 Monitor and Manage Internal Requirements 282
6.9.5 Monitor and Manage External Requirements 284
6.9.6 Monitor and Manage Production or Process Orders 285
6.9.7 Display MRP Master Data Issues 289
6.9.8 Manage Change Requests 290
6.9.9 Detect MRP Situations 293
6.10 Summary 301

7 Managing Planned Orders 303

7.1 Planned Orders 303
7.2 Planned Order Availability Check 308
7.3 Planned Order Conversion 311
7.4 Additional Options for Mass Processing 317
7.5 Summary 321

8 Advanced MRP Features 323

8.1 Subcontracting Planning 323
8.2 Planning Calendar 329
8.3 BOM Explosion Number 333
8.4 Parts Interchangeability 336
8.4.1 Creating an MPN-MRP Set 336
8.4.2 Planning an MPN-MRP Set 339
8.5 Range of Coverage Profile (Dynamic Safety Stock) 341
8.6 Summary 346

9 Demand Management 347

9.1 What Is Demand Management? 348
9.2 Planning Strategies 352
9.2.1 Planning with Final Assembly (Strategy 40) 355
9.2.2 Net Requirements Planning (Strategy 10) 356
9.2.3 Gross Requirements Planning (Strategy 11) 358
9.2.4 Make-to-Order Production (Strategy 20) 359
9.2.5 Planning without Final Assembly (Strategies 50 and 52) 361
9.2.6 Planning with a Planning Material (Strategies 60 and 63) 363
9.2.7 Planning at Assembly Level (Strategies 70, 74, and 59) 365
9.2.8 Assembly-to-Order (Strategies 81 through 86) 367
9.3 Creating a Demand Plan 368
9.3.1 Splitting Independent Requirements 373
9.3.2 PIR Reorganization 373
9.4 Configuring Demand Management 374
9.5 Summary 377

10 Demand-Driven MRP 379

10.1 What Is DDMRP? 379
10.1.1 Buffer Calculation 381
10.1.2 The DDMRP Process 384
10.2 Setting Up DDMRP 386
10.2.1 Product Classification 386
10.2.2 Mass Maintenance of Products 394
10.2.3 Buffer Proposal Calculation 396
10.3 Running DDMRP 400
10.4 Integrating DDMRP with SAP IBP 409
10.5 Summary 410

11 Long-Term Planning 413

11.1 Creating a Long-Term Planning Scenario 414
11.2 Running Long-Term Planning 419
11.3 Processing Simulative Planned Orders 422
11.4 Evaluating the LTP Results 426
11.4.1 Evaluating Work Center Capacity 429
11.4.2 Transferring the LTP Results to the Logistics Information System 430
11.5 Cleaning Up the Long-Term Planning Scenario 435
11.6 Summary 438

12 Predictive Material and Resource Planning 441

12.1 Prerequisites to Run pMRP 442
12.2 Creating a pMRP Simulation 443
12.3 Processing pMRP Simulations 448

12.4 Releasing the pMRP Simulation 456
12.5 Summary 457

13 Administering MRP 459

13.1 Housekeeping MRP 459
13.1.1 Keeping the Planning File Consistent 460
13.1.2 Managing Background Jobs 461
13.1.3 Deleting Old MRP Lists 464
13.2 Troubleshooting MRP 464
13.2.1 Material Not Planned 465
13.2.2 Inconsistencies 467
13.2.3 MRP Live Support Functions 473
13.3 Improving MRP Performance 478
13.3.1 Classic MRP 478
13.3.2 MRP Live 482
13.3.3 Frequent Causes and Solutions 490
13.4 Summary 492

14 Enhancing MRP 493

14.1 Enhancing Classic MRP 494
14.2 Enhancing MRP Live 498
14.3 Enhancing the SAP Fiori Applications of the MRP Cockpit 501
14.4 Summary 504

15 Migrating to SAP S/4HANA 505

15.1 Performing Readiness Check 505

15.2 Assessing Simplifications in MRP 507
15.2.1 Planning File 507
15.2.2 Storage Location Planning 509
15.2.3 Subcontracting 511
15.2.4 Production Versions 511
15.2.5 External Procurement 512
15.2.6 Total Requirements Cleanup 513
15.3 Reviewing Custom Code 515
15.4 Evaluating New MRP Features 516
15.4.1 MRP Live 516
15.4.2 Demand-Driven MRP 517
15.4.3 Predictive Material and Resource Planning 517
15.4.4 SAP Fiori and the MRP Cockpit 518
15.5 Summary 519

Appendices

A Roadmap for MRP in SAP S/4HANA 521
B The Author 525

Index 527

Index

A

ABAP List Viewer 267
ABAP-Managed Database Procedure (AMDP) 498
Actual range of coverage 341
Allocation quota arrangement 123
Area of responsibility 275, 312
Assembly scrap 85, 102
Assembly-to-order (ATO) 367
Availability check 132, 142, 178, 308
  Collective 311
  Customizing 178
  Exceptions 228
  Mass 310, 317
Availability date 176
Available stocks 153
Average daily usage 34, 383, 395, 397

B

Backflush 471
Background job 461, 462, 464, 478, 484
  Completion status 465
  Managing 295
  Schedule status 463
  Scheduling 295
  Total runtime 463
Backward consumption period 348
Backward scheduling 44, 49, 149, 234
BAdI
  MD_ADAPT_DISTRIBUTION 494
  MD_ADD_COL_EZPS 240, 495
  MD_ADD_ELEMENTS 236, 495
  MD_CHANGE_CALENDAR 496
  MD_CHANGE_MRP_DATA 235, 494, 515
  MD_CREATE_GROUPING 251, 496
  MD_DISPLAY_ELEMENT 496
  MD_EXCLUDE_MATERIAL 496
  MD_EXT_SUP 140, 495
  MD_INTERACT_PLANNING 496
  MD_LAST_LOT_EXACT 496
BAdI (Cont.)
  MD_MODIFY_PRODVERS 495
  MD_MODIFY_SOURCE 495
  MD_MRP_LIST 262, 496
  MD_MRP_PARAMETERS 496
  MD_MRP_RUN_PARALLEL 481, 491, 496
  MD_PIR_FLEX_CONS 495
  MD_PLDORD_CHANGE 495
  MD_PLDORD_SCHEDULING 496
  MD_PURREQ_CHANGE 495
  MD_PURREQ_REL_STRAT 496
  MD_SET_TRAFFIC_LIGHTS_DS 259, 496
  MD_STOCK_TRANSFER 494, 515
  MD_SUBCONT_LOGIC 325
  MRP Live 515
  MRP_DISPATCHER_BADI 215, 223, 501
  PPH_MRP_POSTPROCESSING_BADI 500
  PPH_MRP_REUSE_BADI 214
  PPH_MRP_RUN_BADI 501
  PPH_MRP_SOURCING_BADI 140, 501
  PPH_MRP_SOURCING_BADI => SOS_DET_ADJUST 191
  PPMRP_ENHANCE_QUICKVIEW 502
  PPMRP_ENHANCE_SDIV_DETAILS 502
  PPMRP_MAP_MATERIALORDER 502
  PPMRP_MAP_MATSHORT 503
  PPMRP_MAP_MFGORDCOMP 503
  PPMRP_MAP_MFGORDMILESTONES 503
  PPMRP_MAP_MFGORDOPER 503
  PPMRP_MAP_PURCHORD_ON_CREATE 503
  PPMRP_MAP_SUPPLIERMATERIAL 503
  PPMRP_MAP_UNCDEM 503
BAPI 372
  BAPI_MATERIAL_STOCK_REQ_LIST 515
Basic date 106, 197
Basic dates calculation 47
Bill of materials (BOM) 19, 31, 97, 144
  Buffering 157
  Components 100
  Creation 99
  Customizing 144

Bill of materials (BOM) (Cont.)
Items ... 100
Material BOM ... 98
Multilevel BOM ... 104
Multiple BOM ... 98
Variant BOM ... 98
Work breakdown structure (WBS) BOM ... 98
Blocked stock ... 153
BOM explosion ... 31, 35, 50, 51, 142, 166, 333, 379, 492
Customizing ... 145, 166
Exceptions ... 227
BOM explosion date ... 333
BOM explosion number ... 145, 333
Changing ... 333
Creating ... 333
BOM selection ID ... 144, 416
BOM usage (PQR classification) ... 144, 381, 386, 389, 409, 418
Bottom-up pegging ... 268
Buffer ... 383
Buffer action ... 410
Buffer calculation ... 34, 381, 384, 521
Buffer level ... 384, 397
Buffer level profile ... 384
Buffer positioning ... 384, 390
Buffer Positioning app ... 384, 390
Buffer Profile Maintenance app ... 381, 403, 407
Buffer proposal calculation ... 396
Buffer sizing ... 384
Buffer zone ... 34
Bulk material ... 92
Business Add-ins (BAdIs) ... 493
Best practices ... 493
Classic MRP ... 494, 515
MRP Live ... 498
By-product ... 101

C

Capacity issue ... 441, 448, 450, 452
Capacity leveling ... 22, 31, 148, 307
Capacity plan simulation ... 452
Capacity planning ... 372
Capacity requirement ... 197, 441
CDS views ... 498
Change category ... 455
Change request ... 290, 292
New ... 292
Pending ... 293
Checking rule ... 136
Customizing ... 136, 170
Classic MRP ... 24, 482
Execution ... 189, 192, 193, 421
Logic ... 190, 421
Performance ... 478
Collective access ... 235, 254
Compatibility scope ... 193, 347
Component ... 50, 323
Component availability ... 303
Component scrap ... 102
Consumption horizon ... 351
Consumption mode ... 348, 351, 357
Consumption parameter ... 348
Consumption-based planning ... 33
Conversion
Customizing ... 141, 163
Convert Planned Orders app ... 312, 315
Coproduct ... 102
Creation indicator ... 166, 191, 195, 213, 420
Customizing ... 166
Cross-plant view ... 248
Custom code ... 506, 515
Customizing data ... 55, 182
Cycle time ... 383

D

Daily lot size procedure (TB) ... 81
According to the planning calendar (PK) ... 81
Monthly lot size (MB) ... 81
Weekly lot size (WM) ... 81
Days' supply ... 257
Customizing ... 258
Decoupled lead time ... 380, 383, 397
Decoupling point ... 380
Decoupling point buffer ... 384
Delays ... 286
Delivery performance ... 450
Delivery requirement ... 467
Demand Driven Institute ... 379

Demand element ... 273
Demand management ... 21, 347
Customizing ... 374
Demand plan ... 368, 441, 452
Creating ... 368
Demand profile ... 273
Demand variability ... 380
Demand-driven MRP (DDMRP) ... 16, 27, 34, 74, 138, 379, 442, 517, 521
APIs ... 409
Applications ... 380, 384, 386
Integration ... 409, 410
Process ... 384
Setup ... 386, 392
Dependent requirement ... 197, 199, 327, 347
Inconsistency ... 470
Dependent requirements availability
Customizing ... 142
Detailed scheduling ... 146, 147
Customizing ... 146
Detect MRP Situations app ... 295
Deterministic MRP ... 20, 30, 35, 379
Direct procurement ... 86, 153
Customizing ... 153
Direct production/collective order ... 86
Discrete manufacturing ... 318
Dispatcher ... 482
Display filters ... 242, 255
Display MRP Key Figures app ... 484, 485
Display MRP Master Data Issues app ... 155, 289, 464
Distribution key ... 51, 373
Document type
Customizing ... 169
Downstream ... 391
Dump ... 475, 476
Dynamic adjustments ... 384
Dynamic assembly ... 367
Dynamic safety stock ... 91

E

Enhancement M61X0001 ... 208
Error handling ... 154
Customizing ... 154
ES_PPH_MRP_DISPATCHER_BADI enhancement spot ... 490
Evaluation profile ... 164, 259
Customizing ... 259
Exception message ... 20, 35, 52, 225, 267, 300, 521
Customizing ... 229
Standard ... 229
Excess stock ... 294, 380
Explosion date ... 145
External material ... 96
External procurement ... 42, 112, 169, 303
Customizing ... 150
External procurement scheduling
Customizing ... 169
External requirement ... 282, 284

F

Finished product ... 56, 323, 347, 348, 380
Firm element ... 232
Firm receipt ... 38
Firm receipt element ... 233
Firming ... 231
Customizing ... 167
Date ... 240
Type ... 66, 172
Fixed interval ... 397
Fixed lot size ... 491
Fixed lot-sizing procedure ... 79
Fixed order quantity ... 77
Fixed procedure ... 40
Fixed safety stock ... 91
Float ... 48
After production ... 89
Before production ... 89
Customizing ... 141
Forecast ... 347, 350, 379, 441
Forecast indicator ... 172
Forecast requirement ... 75
Form-fit-function (FFF) class ... 336, 338
Forward consumption period ... 348
Forward scheduling ... 44, 149, 404
Function module ... 372
EXIT_SAPLM61C_001 ... 498

Function module (Cont.)
EXIT_SAPMM61X_001 498
MD_MDPSX_READ_API 191
PPH_STOCK_REQ_LISTS_PREREAD 516

G

Goods issue value 388
Goods receipt processing time 46, 48, 88
Goods receipt/availability date 239
Green buffer zone 383
Gross long-term planning 415
Gross requirements planning 358, 359, 416

H

Housekeeping activities 459

I

Independent requirement 348, 373
Individual access 235
Individual stock 168
Individual stock type 168
Industry solution 336
Info record 113, 114
Creating 113
Maintaining 113
In-house production 46
In-house production time 197
Internal procurement 42, 96, 97, 303
Internal requirement 282
Intra-plant view 247, 327
Inventory positioning 384
Inventory-based manufacturer part 337
Item category 324
Item number 155
Customizing 155

J

Job template 218

L

Lead time (EFG classification) 45, 381, 383, 392, 409
Lead time factor 383
Lead time scheduling 429, 496
Leading part 338
Lead-time factor 34
Lead-time offset 51, 103
Lead-time scheduling 47, 106, 197, 306
LiveCache 221
Locks 487
Long-term planning 135, 415
Long-Term Planning (LTP) 28, 413, 441, 479, 522
Background jobs 421
Capacity evaluation 429
Collective access 427
Execution 419
Logic 421
Material analysis 431
Material group analysis 431
MRP List 429
Performance 479
Planned order 424
Results 430
Stock/Requirements List 426
Vendor analysis 431
Long-term simulation scenario 416
Lot size 50
Customizing 175
Lot-for-lot order quantity 77
Lot-for-lot procedure 40, 328, 444
Lot-size independent cost 83
Lot-sizing procedure ... 31, 39, 76, 132, 174, 444
Changing 174
Creating 174
Optimum 77
Period 77, 81
Standard 330, 390
Static 77
Lot-sizing procedure EX 73

Lot-sizing procedure FS 79
Low-level code 36

M

Maintain PIRs app 369
Make-to-order (MTO) 19, 21, 39, 146, 178, 204, 238, 347, 348, 416, 496
Scenario 23, 27
Make-to-project (MTP) 146, 178, 205, 238, 416, 496
Make-to-stock (MTS) 19, 21, 39, 347, 348, 355
Scenario 23
Manage Buffer Levels app 385, 397
Manage External Requirements app 272, 284, 285
Manage Internal Requirements app 272, 282, 288
Manage Material Coverage app 220, 272, 277, 278, 300, 313
Manage PIRs app 369
Manage Production and Process Orders app 272
Manage Situation Types app 296, 298
Manage Teams and Responsibilities app 296
Manufacturer part number (MPN) 336
Manufacturer part profile 337
Standard 337
Mass Maintenance of Products (DD) app ... 384, 394, 397
Mass Maintenance of Products app 395
Mass processing functions 320
Master data 55, 95, 182, 289, 522
Master production scheduling (MPS) 22, 31, 69, 209, 479
Performance 479
Master recipe 106
Material BOM
Changing 98
Creating 98
Displaying 98
Material buffer 380
Material classification 521
Material coverage 277
Material forecast 371
Material grouping 246
Creating 251
Custom 251
Customizing 247
Material item 100
Intramaterials (M) 101
Nonstock items (N) 101
Plant maintenance structure elements (I) 101
Stock items (L) 100
Variable size items (R) 101
Material master 56, 158, 348, 443, 446
Creating 56
Key fields 56, 90, 160
MRP tabs 60
Material requirements planning (MRP) ... 15, 19
Material resources planning 15
Material shortage 380
Material shortage profile 274
Creating 275
Material type 56, 336
Standard 336
Maximum lot size 84, 125, 491
Maximum lot size quantity 41
Maximum MRP interval
Customizing 164
Maximum quantity 125
Maximum stock level 34, 176
Method DISPATCH_GET_PARAMETERS 490
Method GET_MRP_ELEMENTS 481
Method MDPS_ADJUST 501
Migration 210, 505
Minimum lot size 84, 125
Minimum lot size quantity 41
Monitor External Requirements app 272, 282, 284
Monitor Internal Requirements app ... 272, 282
Monitor Internal Shortages app 285
Monitor Material Coverage app 26, 272, 277, 278
Monitor Material Shortages app 281
Monitor Process Orders app 274
Monitor Process Orders apps 285
Monitor Production and Process Orders app 272
Monitor Production Orders app ... 274, 285, 286

Monthly lot size procedure (MB) 40, 81, 330
MPN-MRP set 337, 338
Copying 339
Generating 339
Planning 339
MRP
Input 20
Logic 25
Output 20
Planning concept 379
Within SAP 20
MRP area 93, 180, 325
Assigning 326
Creating 93
Maintaining 94
Subcontracting 327, 328
MRP area type 180
Plant (01) 180
Storage location (02) 180, 184
Subcontractor (03) 181, 184
MRP class 474
MRP Cockpit 16, 25, 219, 260, 272, 426, 501, 518, 522
MRP control parameters 193, 194, 212, 221
MRP controller 20, 137, 254, 275
Creating 137
Customizing 137, 138
Titles 138
MRP dispatcher 211
MRP element 278, 495, 499
Custom 495
MRP evaluation 136
Custom columns 495
Multilevel 264
MRP group 132, 158, 271
Adjustment horizon 160
Assign 158
Availability check 170
Consumption mode 160
Customizing 159, 195
Evaluation 164
External procurement 169
FERT 158
Horizons 160
MRP type 170
Planned order 163
MRP group (Cont.)
Planning run 164
Production storage location 162
Program plan 163
MRP List 134, 135, 260
Changing 499
Collective access 261
Deleting 262, 464
Individual access 261
Terminations 262
MRP Live 24, 516
Execution 189, 192, 216
Logic 190, 213
Performance 482
Support functions 473
Technical parameters 487
MRP objects 134
MRP procedure 29, 62, 521
B—Reorder Point Planning 33
D—Material Requirements Planning 30
Forecast-based 69, 75
Master production scheduling (MPS) 31, 69, 209
Reorder point planning 69
R—Time-Phased MRP 34
S—Forecast-Based Procedure 33
Time-phased planning 69, 75
MRP results 235
Analysis 235
MRP type 29, 40, 62, 76, 132, 173, 460, 461, 510
Changing 171
Consumption-based 69, 201, 267
Creation 62
Custom 29, 139
Customizing 30, 171
Demand-driven 392, 400, 442
Forecast-based 90, 371
M1 69
M2 69
M3 69
Master production scheduling (MPS) 69
ND 126
P1 ..... 66, 67
P2 ..... 66, 67
P3 67

MRP type (Cont.)
P4 67
PD 64, 65, 81
R1 75
R2 75
Reorder point 90
Standard 29, 62, 64, 170, 390, 400
Time-phased 329
V1 ..... 73, 173
V2 ..... 74, 173
VB 70, 71, 73, 173
With firming element 240
Multilevel BOM 333
Multilevel material simulation 453
Multilevel planning 199
Multilevel project planning 204
Multilevel sales order planning 204
My Situations app 293

N

Navigation profile 251
Customizing 253
Net change 36
Net change in total planning 194
Net change planning run 36, 213
Net flow position 401
Net requirements calculation 30, 35, 37, 38, 45, 90, 348
Network 264
NProc record 471
Number range 134, 477
Assigning 134
Customizing 135
Resetting 136
Standard 135
Number range interval 134

O

Object Inspector 452
Opening period 46, 49, 89, 311
Operation scrap 102
Operational data 413
Operational MRP 413, 419, 444
Optimal lot-sizing procedure 77
Dynamic lot size creation (DY) 83
Groff reorder procedure (GR) 83
Least unit cost procedure (WI) 84
Part period balancing (SP) 84
Optimum lot-sizing procedure 40, 83
Order finish date 145
Order report 267, 268
Exceptions 265
Order reservation 282
Order start date 145
Overall plant parameters 132
Environment 134
Master data 136
Planned orders 141
Planning run 142

P

Parallel processing 185, 477, 488, 496, 499
Customizing 185
Parallelization 487, 488
Parts interchangeability 336
Pegging 265
Performance 25
Customizing 156
Improvement 25
Performance log 485
Period lot-sizing procedure 40, 45, 77, 81, 329, 331
Daily lot size (TB) 81
Period split 373
Customizing 163
Phantom assembly 51, 86
Planned delivery time 49, 88
Planned independent requirement (PIR) 21, 38, 50, 160, 333, 347, 349, 397, 413, 441
Changing 370
Consumption 350, 495, 499
Creating 349
History of changes 369
Reduction 351
Reorganization 373
Planned order 141, 264, 268, 303, 495
Availability check 308
Changing 499

Planned order (Cont.)
Component ... 197
Converting ... 141, 142, 154, 163, 303, 311–313
Creating ... 304, 305
Date ... 234
Deleting ... 172
Planned order (object PLAF) ... 134–136
Planned order profile ... 304
Planned receipt ... 38
Planner Overview app ... 385, 408
Planning calendar ... 75, 88, 329
Creating ... 330
Planning calendar procedure (PK) ... 81
Planning date ... 75
Planning element ... 236, 495
Planning file ... 35, 36, 43, 126, 164, 460, 506
Consistency check ... 460
Planning file entry ... 126, 164, 194, 418, 460, 461, 466
Creating ... 126
Updating ... 164
Planning horizon ... 506
Planning mode ... 195, 490
1—Adapt Planning Data ... 195, 196, 213
2—Re-explode BOM and Routing ... 196
3—Delete and Recreate Planning Data ... 196, 213
Planning priority status ... 405
Planning result ... 270
Planning run scope ... 193
Planning scenario ... 414, 427, 443, 511
Creating ... 414
Dependent data ... 435
Preconfigured ... 414
Releasing ... 418, 444
Planning segment ... 243, 361
Planning situation ... 202, 270
Planning strategy ... 39, 348, 352
10, net requirements planning ... 356
11, gross requirements planning ... 358
20, MTO production ... 360
25, make-to-order for configurable material ... 360
40, planning with final assembly ... 352, 355, 366
Planning strategy (Cont.)
50, planning without final assembly ... 361, 363
52, planning without final assembly ... 361, 363
59, planning at assembly level ... 365
60, planning with a planning material ... 363
63, planning with a planning material ... 363
70, planning at assembly level ... 365
74, planning at assembly level ... 365
81, assembly processing with planned orders ... 368
82, assembly processing with production orders ... 368
83, assembly processing with networks ... 368
84, service orders ... 368
85, assembly processing with network/project ... 368
86, assembly processing with process orders ... 368
Standard ... 374
Planning table ... 349
Plant ... 132
Capacity ... 414
Customizing ... 133
Maintaining ... 133
Predictive Material and Resource Planning (pMRP) ... 16, 28, 413, 441, 517, 521, 522
Background job ... 444
Concept ... 441
Creating ... 443
Customizing ... 442
Process ... 442
Releasing ... 456
Process manufacturing ... 318
Process order ... 268, 285, 303, 319
Process pMRP Simulations app ... 442, 448, 455, 456
Processing indicator ... 261
Processing key ... 194
Procurement quantity ... 35, 39
Procurement type ... 42, 85, 95, 304
Both procurement types (X) ... 85
Consignment ... 86
Direct procurement ... 86
Direct production/collective order ... 86

Procurement type (Cont.)
External procurement (F) ... 85
In-house production (E) ... 85, 88
Phantom assembly ... 86
Production in alternative plant ... 86
Stock transfer ... 86
Subcontracting ... 86
Withdrawal from alternative plant ... 86
Product ... 380
Product classification ... 382, 386, 388, 409
Product group ... 199
Product group planning ... 271
Production date ... 47, 106
Production in alternative plant ... 86, 139
Production order ... 268, 285, 303, 319, 413
Production Planning and Detailed Scheduling (PP/DS) ... 22, 25, 96, 192, 211, 221, 223, 517, 521
Production storage location, Customizing ... 162
Production version ... 50, 96, 97, 107, 324, 443, 511
Change ... 108
Changing ... 495
Consistency check ... 110
Creating ... 108
Locking ... 108
Production/process order ... 264
Program
PPH_MRP_START ... 216, 462
PPH_SETUP_MRPRECORDS ... 128
RLDO5OOO ... 310
RM6OFORC ... 371
RM6OROLL ... 373
RM6ORR2O ... 373
RM6ORR3O ... 373
RM6ORR4O ... 374
RMCBDISP ... 434
RMMDBOM1 ... 158
RMMDEKS1 ... 434
RMMDKP01 ... 262
RMMPS000 ... 209, 463
RMMRP000 ... 209, 462
RMMRP010 ... 421, 463
SAPLM61K ... 173
Project ... 264
Project stock requirements grouping
Customizing ... 168
Purchase order ... 268
Purchase requisition ... 268, 323, 413, 420, 495
Changing ... 499
Releasing ... 496
Purchase requisition (object BANF) ... 134–136
Purchasing contract ... 118
Purchasing document ... 472
Inconsistency ... 472
Purchasing group ... 150
Purchasing processing time ... 49, 150

Q

Qualified spike demand ... 402
Quota agreement
Changing ... 121
Quota arrangement ... 43, 50, 96, 121, 125
Creating ... 121

R

Range of coverage data ... 257
Range of coverage profile ... 341, 344
Creating ... 341
Rate-based scheduling ... 147
Raw material ... 56, 104, 347, 380, 414, 441
Readiness Check ... 505
Receipt element ... 264
Red base ... 383
Red buffer zone ... 383
Red safety ... 383
Reference ID ... 446
Regenerative planning ... 36, 194
Release period ... 89
Reorder point ... 33, 34, 70, 173, 267, 402
Reorder point calculation ... 383
Reorder point procedure ... 45
Repetitive manufacturing ... 303, 471
Repetitive manufacturing dependent requirements ... 471
Replenish to maximum stock level procedure ... 40
Replenishment element ... 416
Replenishment execution ... 385

Replenishment Execution app 404
Replenishment Execution by On-Hand Status app 385
Replenishment lead time 239
Replenishment planning 385
Replenishment Planning app 404
Replenishment Planning by Planning Priority app 385
Replenishment proposal 35, 39, 43, 76, 85
Changing 290
Replenishment proposal type 41
Report
ATP_VBBE_CONSISTENCY 468
CS_BOM_PRODVER_MIGRATION ... 111, 112
CS_BOM_PRODVER_MIGRATION02 ..... 111, 512
MRP_AREA_STORAGE_LOC_MIGRATION 509
PMRP_CREATE_ENVIRONMENT_MAT ... 442
PPBICO40 314
PPBICOR8 314
PPH_CONVERT_MRPRECORDS 508
PPH_CONVERT_MRPRECORDS_SIMU 508
PPH_MRP_SET_CACHE 275
PPH_MRP_START 483
PPH_SETUP_MRPRECORDS 328, 460
PPH_SETUP_MRPRECORDS_SIMU 418
PPIO_ENTRY 319
PPMRP_CHANGE_REQUEST_DELETE 293
RM06C020 469
RM06HL04 473
RMCVPLRQ 317
RMMD07NEW 256
RMMDDIBE 94, 185
RMMDERRO 262, 263, 464
RMMDFD00 436
RMMDKP01 464
RMMDMONI 479, 480, 497
RMMDPERF 480
RMMDVM10 508
RMPLAF00 436
RMPLSC00 436
SDRQCR21 ..... 468, 515
YMRPAREO 184
ZCHECKRESB1 471
ZDELFLGINRES 472
Report (Cont.)
ZINCON_REPROC 472
ZPSFCO99 472
ZRMBF06 472
Reporting
Customizing 136
Reprocessing record 471
Requirement class 354, 374
Requirement date 176
Requirement type 352, 354, 374, 375
Requirements plan 368
Rescheduling
Customizing 151, 161
Exception message 202
Exceptions 228
Rescheduling check 151, 230, 232
Rescheduling horizon 231
Long 232
Short 233
Rescheduling message 280
Reservation 134–136
Inconsistency 472
Restricted use stock 153
Rolling interval 397
Rough-cut scheduling 147
Rounding profile 41, 84, 125
Rounding value 41, 84
Routing 47, 105, 306, 429, 443
Routing selection ID 147

S

Safety stock 34, 90, 341, 383
Customizing 165
Dynamic 341, 343
Safety time 91, 239
Sales and operations planning (S&OP) 20, 199, 347, 371
Sales forecast 347
Sales order 264, 347, 350
Customizing 354
Inconsistency 467
Sales order BOM 146
Creating 98
SAP Advanced Planning and Optimization (SAP APO) 20, 221, 246, 252
SAP Customizing Implementation Guide (SAP IMG) 131
SAP ERP 20, 36
SAP Fiori 26, 441
Applications for MRP 260, 272, 275, 518
Extensibility 501
Recommendation 506
Roles 26
SAP Fiori launchpad 26, 216, 275, 279, 284, 442
SAP Fiori Library 501
SAP HANA 25, 190, 473
SAP Integrated Business Planning (SAP IBP) 20, 222, 347, 372
SAP S/4HANA migration 500
Schedule Buffer Proposal Calculation app 385, 396
Schedule Copying Total Forecast Runs app 371
Schedule Lead Time Classification of Products app 384
Schedule Lead Time of Products (DD) app ... 392
Schedule line 42, 329, 369, 469
Schedule MRP Runs app 216, 219, 222, 462
Schedule PIR Reorganizing Runs app 374
Schedule pMRP Simulation Creation app 442, 444
Schedule Product Classification (DD) app 386
Schedule Product Classification app 384
Scheduling 43, 46
External procurement 48
In-house production 46
Scheduling agreement 118, 268, 420
Creating 118
Standard type LP 118
Scheduling horizon 148
Scheduling margin key 46, 89
Scheduling type 149
Scope of planning 206, 214
Selection group 226
Customizing 229
Selection rule 245, 255
Custom 245
Semifinished product 56, 104, 222, 323, 380
Shortage 273, 303
Shortage calculation 273
Shortage definition 273, 283
Custom 273
Short-term simulation 415
Simplification 507
Creation indicator 191
External procurement 512
Planning file 507
Production version 511
Storage location 248
Storage location planning 509
Subcontracting 248, 511
Total requirements 513
Simplification item 506
Simplified sourcing 115, 118, 121, 511
Simulation
Changing 446
Creating 446
Logging 446
Processing 448
Simulation creation 444
Simulation ID 446
Simulation scenario 414
Simulative dependent requirements 134
Simulative MRP 413
Simulative planned order 413, 422
Firming 423, 435
Scheduling 423
Single-item planning 202, 339, 424
Single-item/multilevel planning 199, 201, 209, 419, 421
Single-item/single-level planning 197, 199, 209, 419, 421
Situation handling 235, 293, 300, 521
Setup 294
Situation template 298
Situation type 296
Creating 298
Enabling 300
Sizing 506
Source list 96, 115
Source of supply 115, 324, 441, 453, 512
Changing 453, 495
Determination 96, 117
Determining 499
Special procurement
Customizing 139

Special procurement type 42, 86, 132, 304
Custom 139
Special stock segment 204
Spike horizon 402
Spike horizon constant 402
Spike horizon DLT multiplier 402
Spike threshold 403
Splitting quota 123
SQLScript 498
Start in past 156
Customizing 156, 167
Static assembly 367
Static lot-sizing procedure 40, 77
Fixed order quantity (FX) 77
Lot-for-lot order quantity (EX) 77
Stock buffer 380
Stock in transfer 153
Stock separation 325, 511
Partial 325
Stock transfer 43, 139
Stock transfer requirement 499
Stock type 38
Stock/Requirements List 426
Collective access 254
Data selection 235
Exceptions 226
Filters 242
Grouping 246
Individual access 236
Navigation profile 251
Order report 267
Selection rules 242
Storage cost 83
Storage cost code 83
Storage location 162, 182, 305, 509
Customizing 184
Strategy group 348, 353
Creating 375
Defining 357
Subcontracting 50, 86, 97, 323–325, 468, 506
Logic 495, 499
Subcontracting requirement 327
Inconsistency 468, 470
Subcontracting requisition BOM 324
Subcontractor 323
Supersession chain 246
Supply element 273
Supply profile 273
Support functions 473
Syntax error 475

T

Table
DBVL 127
DBVM 127, 507, 509, 516
DVER 172
EKBE 473
EKES 473
EKET 473
MATDOC 172
MDKP 191, 515
MDMA 184
MDTB 156, 191, 515
MDTC 156, 191
MDVL 127
MDVM 127, 507, 509, 516
MVER 172
PLAF 422, 471
PPH_DBVM 127, 418, 507, 516
PPHDBVMSET 477
PPHMRPSET 486, 490
RESB 422, 468, 471, 480, 491
RQIT 513
VBBE 468, 513
VBBS 513
Third-party subcontracting 328, 329
Time fence 161, 404
Customizing 161
Time horizon 243
Today scheduling 44, 156
Tolerance value 233
Top-down pegging 268
Top-down planning 347
Total planning run 206, 207, 209
Total requirements 513
Transaction
/UI2/FLP 275
C223 108
CA97N 88, 107
CM38 429
CO06 136

Transaction (Cont.)
CO40 312
CO41 313
COGI 471
COHV 311, 319
COHVPI 319
COMAC 319
COOIS 318
COOISPI 318
COR7 312
COR8 314
CS01 ..... 98, 99
CS02 98
CS03 98
CS61 98
CS71 98
KSOP 435
MO3 209
MCB 433
MCB& 433, 434
MCEA 431
MCEB 431
MCEC 431
MD_FORCE_MRP_CLASSIC 211
MD_MRP_FORCE_CLASSIC 192, 263, 276, 464, 465, 482, 488, 498
MD_MRP_PERFLOG 214, 484, 490
MD01 ..... 167, 207, 208, 419, 498
md01 209
MD01N 191, 192, 213, 214, 219, 474, 483, 486, 501
MD02 ..... 167, 199, 209, 215, 419, 496, 513
MD03 ..... 167, 197, 496
MD04 .... 92, 235, 236, 251, 254, 278, 426, 473
MD05 261
MD07 ..... 254, 256, 257
MD08 ..... 262, 464
MD09 268
MD11 ..... 304, 308
MD12 308
MD14 315
MD15 ..... 142, 315
MD16 317
MD20 127
MD21 ..... 126, 466
MD25 330
Transaction (Cont.)
MD26 330
MD27 330
MD40 ..... 167, 209
MD41 209
MD42 209
MD43 ..... 202, 424, 466
MD44 270
MD45 270
MD46 270
MD47 271
MD48 ..... 271, 429
MD4C 264, 267
MD50 204
MD51 205
MD61 ..... 349, 368
MD62 ..... 370, 457
MD67 373
MD70 ..... 371, 457
MD73 372
MD74 373
MD75 373
MD76 374
MDBS 209
MDBT 208
MDSP 333
MDUM 317
MDVP 308, 317
ME01 115
ME11 113
ME31 ..... 118, 329
ME32 329
MEQ1 121
MF47 471
MFBF 472
MM01 ..... 56, 336
MM02 513
MP30 ..... 62, 75
MP38 75
MS01 ..... 419, 421
MS02 ..... 419, 421
MS03 421
MS04 426
MS05 429
MS06 429
MS07 427

Transaction (Cont.)
MS11 422
MS12 422
MS13 422
MS31 414
MS32 436
MS44 429
MS47 429
MS50 421
MS51 421
MS70 ..... 430, 434
MS71 433
MSBT 421
OM0E 206
OM0I 245
OM0J 243
OM0K 252
OM0L 229
OM0N 255, 265
OM0O 259
OMD3 229
OMD9 87
OMDC 89
OMDQ 30, 171
OMDU 132
OMDW 232
OMI1 91
OMI2 134
OMI4 ..... 82, 83, 123, 174
OMIA 341
OMIL 258
OMIO 173, 240
OMIQ 185
OMIX 208, 498
OMIY 127
OMIZ 180
OMIZA 184
OMIZB 184
OMJJ 377
OMP1 374
OMP4 369
OMPH 164, 373
OMPN 337
OMPO 374
OMS4 422
OPP1 132

Transaction (Cont.)
OPPJ 179
OPPQ 132, 134, 335, 492
OPPS 375
OPU3 107
OS20 418
OS24 100
OS28 100
OS31 ..... 144, 418
OSP2 513
OVZ2 513
OVZG 375
OVZH 375
OVZI 354, 375
OWD1 84
PICO1 337
PPH_MDAB 128
PPH_MDRE 460
SE18 ..... 494, 500, 502
SE38 515
SM36 209
SM37 ..... 209, 462
SM51 186
SM56 136
SM59 186
ST22 ..... 463, 475
Transactional data 55

U

Unfirmed planning elements 231
Upstream 391
Usage value (ABC classification) 381, 386, 388, 409
User exit 208, 497, 498
User interface improvement 25, 260
User role SAP_BR_MATL_PLNR_EXT_PROC 275
User role SAP_BR_PRODN_PLNR 275

V

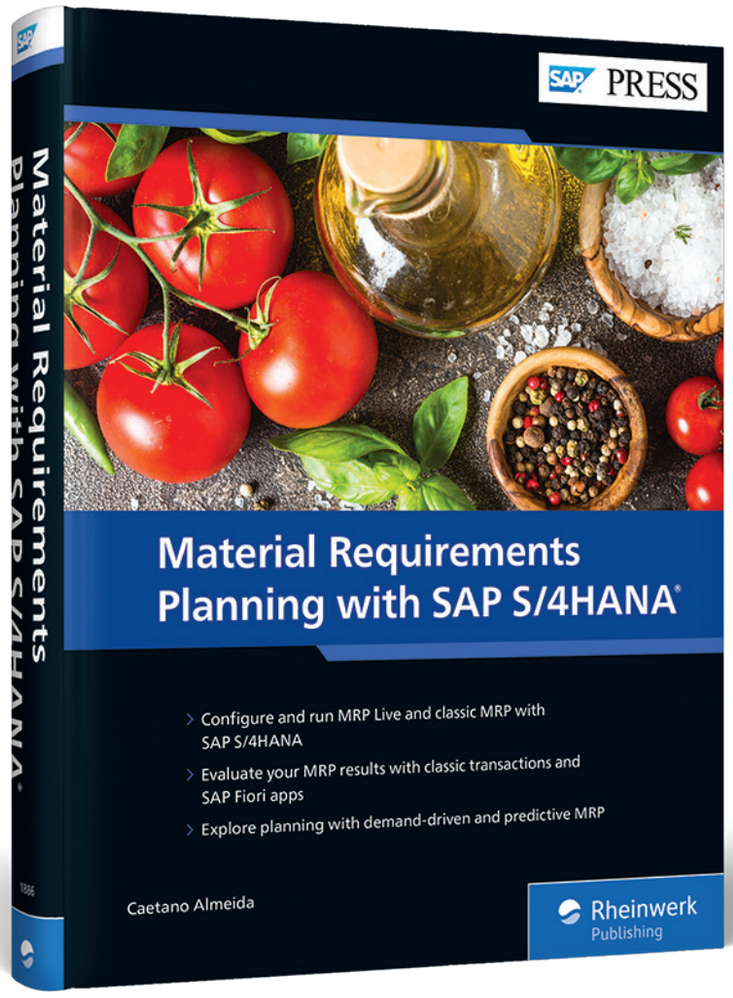
Validity period 122
Variability (XYZ classification) 381, 386, 389, 409
Variability factor 34
Variant configuration 51

W

Warning message 136
WBS BOM 146
Creating 98
WBS element 264
Weekly lot size procedure (WM) 40, 81, 330
Withdrawal from alternative plant 86, 139
Work center 307, 429, 443, 446
Work center capacity 429, 441

Y

Yellow buffer zone 383, 401



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