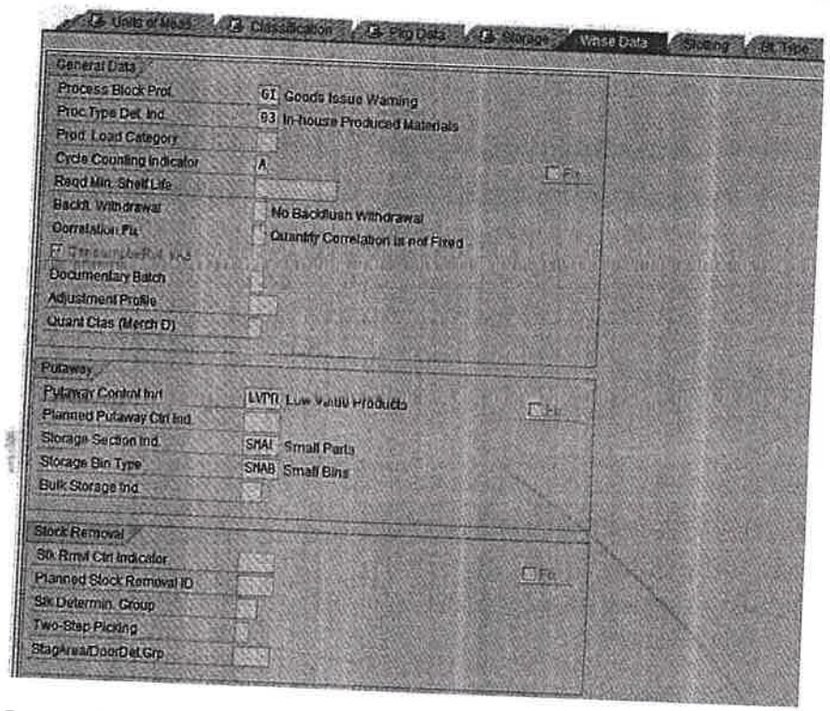
7.1.6 Warehouse Data (Whse Data) View

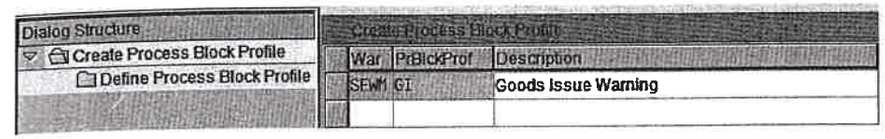
The fields in this view influence the product movement, putaway, and picking in the warehouse.



Process block profile: A process block profile can be used to trigger an error or warning message when certain processes are performed in the warehouse for a product. For example, it can display a warning message when the product is goods issued. To enable this feature, the process block profile must be defined and assigned to the product master. The supported warehouse processes are as follows: create warehouse task, confirm warehouse task, post goods receipt, post goods issue, create inventory document, and count inventory document.

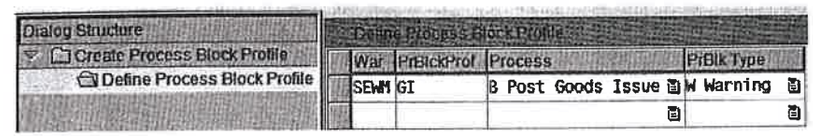
To define process block profile go to **SPRO | IMG | Extended Warehouse Management | Master Data | Product | Define Process Block Profile**

Here, click on the "New Entries" button on the application toolbar, enter warehouse number, process block profile code, and description. Hit the "Enter" key and click "Save."



Select the entry previously defined and double-click on "Define Process Block Profile" under "Dialog structure." Click on "New Entries," enter warehouse number, process block profile, select the process, and process block type, and click "Save." After it is created, assign it to the product master.

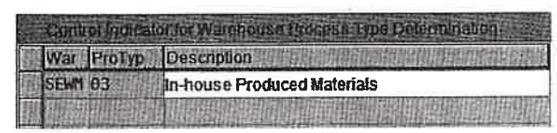
The process block profile will be ignored if, in the WPT, the "Skip Process Block Profile" indicator is checked.



Process type determination indicator: The WPTs are similar to movement types in ERP WM, which is covered in detail in chapter 11. It provides the information required for putaway, stock removals, internal stock transfers, and stock postings. The process type determination indicator assigned to the product master is used to determine the relevant process type for warehouse activities.

Process type determination indicators can be defined in **SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Control Indicators for Determining Warehouse Process Types**

Here, click the "New Entries" button on the application toolbar; enter warehouse number, process type indicator, and description. Click "Save" to save the entries.



Cycle Counting (CC) Indicator: This is also called the ABC indicator. They are used to define the frequency of counting for the products. Category A products are counted more often than those in category C.

Cycle count indicators can be defined in **SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Configure Cycle Counting**

Here, enter the warehouse number, CC indicators, interval for physical inventories in workdays, and the allowed buffer time.

Cycle Counting Counting Cycle

War	CC Ind.	InPr	BT
SEWM	A	30	5
SEWM	B	60	5
SEWM	C	90	5

The "Fix" check box in the general data section indicates that the CC indicator is fixed and should not be changed by slotting function.

Backflush Withdrawal: This is used to specify that the product is consumed automatically at the time of production order confirmation and not explicitly issued to the production order.

Correlation Fix: This information is used when creating kits with value added services (VAS) orders. If the quantities have a fixed correlation, the quantity of the kit components is automatically adjusted if the kit header quantity is changed. If the quantity correlation is not fixed, the quantities are not adjusted automatically.

Consumption-Relevant for VAS: It defines the consumption relevance for VAS auxiliary products. If the product is an auxiliary product and consumption is to be posted at the time of VAS order confirmation, this indicator needs to be checked.

To consume the stock of the auxiliary products during the VAS order confirmation, you also have to assign a storage bin to the VAS work center.

Documentary Batch: This indicator specifies whether the product is documentary batch relevant or not. It is covered in more detail in chapter 8.

Putaway Control Indicator: This indicator defines the number of storage types that are relevant for the putaway of the product. It can be used to specify that during putaway, certain products are put away only in certain storage types. The indicator assigned in the product master helps to search the appropriate storage types during product putaway.

Putaway Control Indicators can be defined in **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Define Putaway Control Indicator**

Putaway Control Indicator

War	PACI	Description	Storage T
SEWM	HEVY	Heavy Products	
SEWM	HVPR	High Value Products	
SEWM	LVPR	Low Value Products	
SEWM	SMAL	Small Products	

Later, in chapter 14, the storage type search sequence will be covered in more detail.

Storage Section Indicator: Like the putaway control indicator, the storage section indicator is used to determine appropriate storage sections during putaway.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Section Search | Create Storage Section Indicators

Storage Section Indicators

War	Secin	Description
SEWM	SMAL	Small Parts
SEWM	HEVY	Heavy Parts
SEWM	HVAL	High Value Parts

Planned Putaway Control Indicator: This indicator is set when the slotting results are saved. Once the slotting run is activated, planned putaway control indicator is copied to the putaway control indicator. If the Fix check box is checked, system will ignore the planned putaway control indicator and will not update the putaway control indicator when the slotting run is activated.

Storage Bin Type: Storage bin type indicator is used to determine appropriate storage bin type during putaway.

Bulk Storage Indicator: This classifies products according to the way they are stored in a bulk storage area. It is used to define how the products can be stacked in the bulk storage bin. This indicator is a decisive factor in the definition of the structure of a block within a bulk storage area. It is applicable only for bulk storage type putaway.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Putaway Rules | Storage Behavior: Bulk Storage | Define Bulk Storage Indicators

Bulk Storage Indicator

War	BSI	Description
SEWM	05	5 Stacks
SEWM	04	4 Stacks

Stock Removal Indicator: The stock removal indicator is used to determine the appropriate storage types during picking.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Strategies | Define Stock Removal Control Indicator

Stock Removal Control Indicator

War	SRCI	Description
SEWM	PICK	Stock Removal Strategy

Two-Step Picking: This indicator is used to specify the relevance of two-step picking. In EWM, you can pick products directly with one step or with two-step picking. If two-step picking is active in EWM for the warehouse number, and product-dependence is defined (the appropriate field in the Extended Warehouse Management view of the product master record indicates two-step picking), this key controls whether or not the two-step method will be used to pick the product.

Staging Area/Door Determination Group: This indicator is used to determine the staging area or doors during loading and unloading activities.

It is defined in **SPRO | IMG | Extended Warehouse Management | Master Data | Staging Areas | Define Staging Area and Door Determination Groups**

Staging Area/Door Determination Group

War	SA/DDetGrp	Description
SEWM	HVAL	High Value Parts (Stg. Group)
SEWM	REGL	Regular Parts (Stg. Group)

To assign staging area groups to the warehouse doors, go to **SPRO | IMG | Extended Warehouse Management | Master Data | Warehouse Door | Assign Staging Area/Door Determination Group to Door**

Staging Area/Door Determination Grp

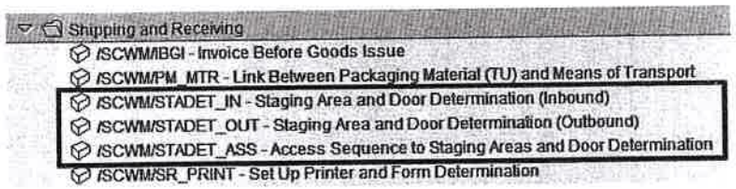
War	Whse Door	SA/DDetGrp
SEWM	RE01	REGL
SEWM	RE02	REGL
SEWM	RE03	HVAL

In addition to the above config, the following settings have to be defined in the SAP easy access menu.

i. **Define settings for inbound and outbound to determine the staging area and doors:** Transactions are /SCWM/STADET_IN for inbound and /SCWM/STADET_OUT for outbound.

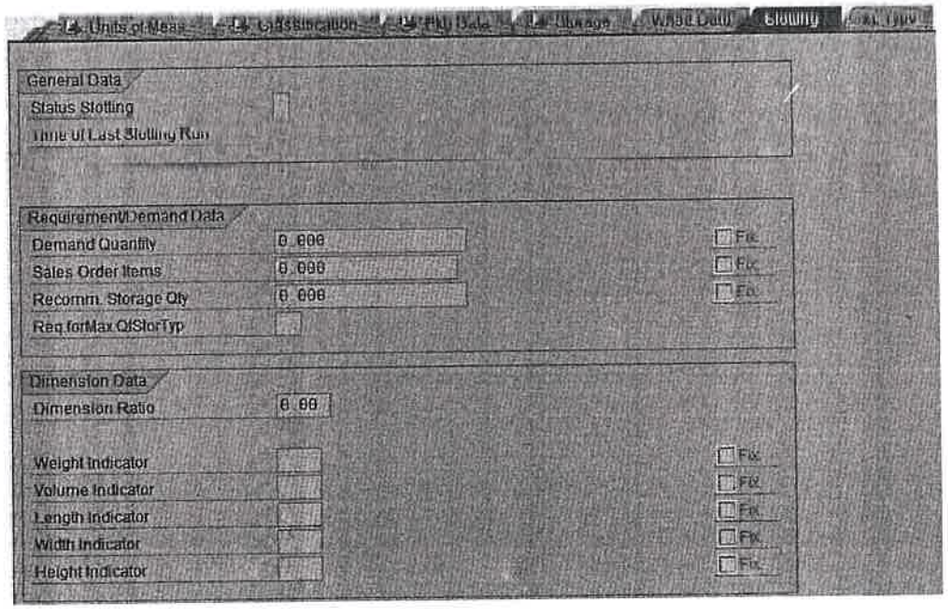
ii. **Access Sequence to Staging Areas and Door Determination:** Access sequence can be defined in transaction /SCWM/STADET_ASS.

All these transactions are available under **SAP Easy Access | SAP menu | Extended Warehouse Management | Settings | Shipping and Receiving**



7.1.7 Slotting View

In this view, maintain the parameters that are required for the slotting and rearrangement process.



Status Slotting: This indicator specifies whether slotting is allowed or not. The available options are:

i. Product not yet slotted/slotting allowed

ii. Product not yet slotted/slotting not allowed

iii. Product already slotted/reslotting allowed

iv. Product already slotted/reslotting not allowed

Time of Last Slotting Run: This displays the date and time of the last slotting run.

Demand Quantity: This field is used during the slotting run to determine the total quantity that must be shipped from the warehouse during a given time frame. The data in this field can come from APO or through manual input or custom program.

Sales Order Items: Like demand quantity, the sales order item field value is used during the slotting run to determine the total number of sales order items to be shipped from the warehouse during a given time frame. The data in this field can come from APO or through manual input or custom program.

Recommended Storage Quantity: During the slotting run, this information is used to determine the recommended storage quantity in the warehouse for the product.

Request for Calculation of Maximum Quantity in Storage type: Based on the value in this field, the slotting program decides which value to use to calculate the maximum quantity in the storage type. Options available include demand quantity, sales order items, and recommended storage quantity.

7.1.8 Storage Type Data View

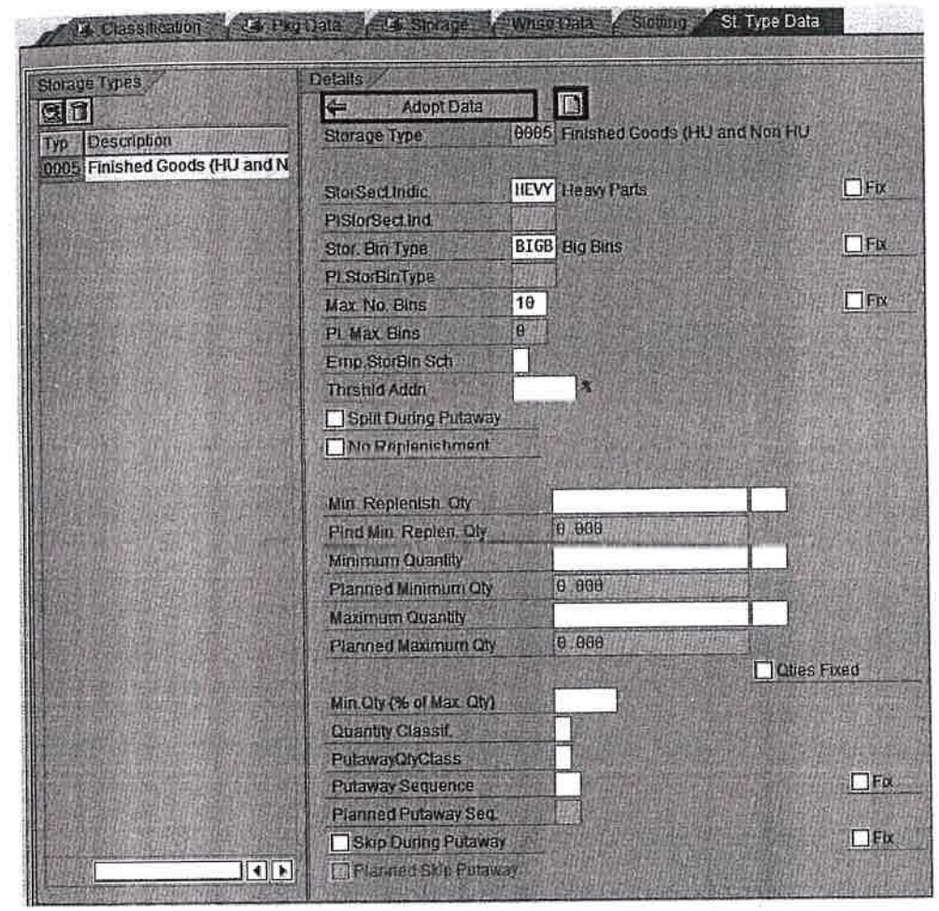
In this view, data can be maintained specific to a particular storage type in which a product will be stored. This data generally consists of indicators used for replenishment, stock placement, and removal.

Some indicators are found in both storage type data view and warehouse data view. In such cases, the values defined in the storage type data view are used for bin determination. If the values are not defined in the storage type data view, the values defined in the warehouse data view is used for bin determination. The same logic will apply even with slotting.

If some of the values defined here should not be affected with the slotting results, then the "Fix" indicator should be checked on.

It is possible for products to be stored in more than one storage type. In the storage type data view, more than one storage type data can be defined. To define the storage type data, click on the "Create" button, enter the values in the desired fields, and click on the "Adopt" button. This will display the

storage type on the left side of the storage type panel. Data that can be maintained will be displayed on the right hand side of the storage type panel.



Maximum Number of Bins: This is used to specify the maximum number of bins that products can occupy in a specified storage type. This way you can avoid having one product occupy all or most of the storage type bins, leaving little or no space for other products.

Planned Maximum Number of Bins: The slotting program determines the maximum number of bins, as per the slotting logic.

Empty storage bin search: In addition to the putaway rule, the system will consider the settings defined here to search the empty bin. Here, it is possible to specify how the system should select the empty bins for putaway. The options available include the following:

i. **Sorting According to Definition**: If this option is selected, the system will use the sort field defined in the storage bin master to sort and select the empty bins.

ii. **Near To Fixed Bin:** Empty bins are prioritized according to their closeness to a fixed bin.

iii. **Product Decides**: The setting for the search rule in the product decides the course of action.

Threshold Addition: If a "Split During Putaway" option is active at the storage type, the system will refer to the value of "threshold addition" before the WT created for the split quantity (qty). If the qty expected in the bin is less than the threshold value, the system will not split the putaway qty. This field will avoid unnecessary small qty split, which can reduce the operational efficiency. The threshold value is defined in the percentage of the storage bin capacity.

Split During Putaway: This indicator is effective for the storage type configuration if the value is defined as "product master decides" for the "split during putaway" field.

No Replenishment: It is possible that in the storage type, some products require replenishment and some do not. If the products are not related to replenishment, the check box should be checked.

Minimum Replenishment Qty: This field is used to specify the minimum qty that should be considered for replenishment. Examples include full pallet, full box, and so on.

Planned Minimum Replenishment Qty: The value in this field is populated when the slotting results are saved. Once the results are activated, the value in this field gets copied to the minimum replenishment quantity field.

Minimum Qty: This field is used to specify the minimum quantity of stock that should be stored for this product in the storage type.

Maximum Qty: This field is used to specify the maximum quantity of stock that should be stored for this product in the storage type.

Quantities Fixed: If the slotting program should not change the minimum and maximum quantities, check this check box.

Minimum Quantities (% of Max. Qty): This field maintains the minimum qty in the percentage of maximum qty. In this case, minimum qty is calculated as per the percentage defined.

Putaway Sequence: The value in this field is used to sort the storage types within a storage type group during putaway for bin determination.

Skip during Putaway: If this indicator is checked, this storage type will be skipped during the determination of the destination bin.

Summary

This chapter has explained all about product master data (i.e., different views of product master data and the fields that are applicable to WM). The next chapter will explore how to activate batch management in the EWM system.

Chapter 8: Batch Management

Batch management is used by many industry sectors to differentiate products by characteristic. In ERP, it is a module by itself, tightly integrated with MM, PP, WM, EWM, QM, and SD. Because batches do not have master data attributes, all batch-related information is stored as characteristics. This chapter will discuss the configuration of batch management in the EWM system. It covers configuration for both Documentary and Non-Documentary batches.

8.1 Batch Management In EWM

Batch management in EWM was introduced as part of the EWM 2007 release, which requires ECC 6.0 enhancement pack 3. One of the requirements to activate batch management in EWM is that in the ERP system, batch number needs to be set unique for each material. The characteristics and batches of the batch-managed materials must be transferred from ERP to EWM systems as part of a CIF data transfer process.

Table 8.1A gives an overview of the configuration required in the ERP and EWM systems to effectively communicate batches between these two systems.

Table 8.1A Batch Management Configuration

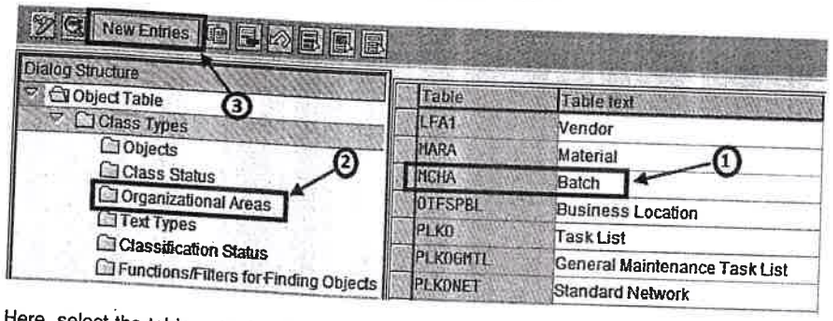
S. No	Configuration Check List	System	Transportable
1	Define Organizational Area for Class Type BATCH	Both	Yes
2	Assign Organizational Area to Class (TCode CL02)	ERP	No
3	Define Number Range for Batch	Both	No
4	Activate LOG_LE_INTEGRATION business function	ERP	No
5	Maintain EWM Specific Parameters	ERP	Yes
6	Setting for New Batches	EWM	Yes
7	Settings for Warehouse Task Creation	EWM	Yes
8	Activate Documentary Batch in EWM	EWM	Yes
9	Activate Documentary Batch in Product Master	EWM	Not Applicable
10	Distribute Documentary Batch Settings from ERP	EWM	No
11	Define Update Control for Batches	EWM	Yes
12	Create Batches for Products	EWM	Not Applicable
13	Batches in Goods Receipt Process	EWM	Not Applicable
14	Batches in Goods Issue Process	EWM	Not Applicable
15	CIF Batch specific data from ERP to EWM (Tcode CFM1, CFM2)	EWM	Not Applicable
16	Verify Classes and Classification Data	EWM	Not Applicable

8.1.1 Define Organizational Area for Class Type BATCH—Both Systems

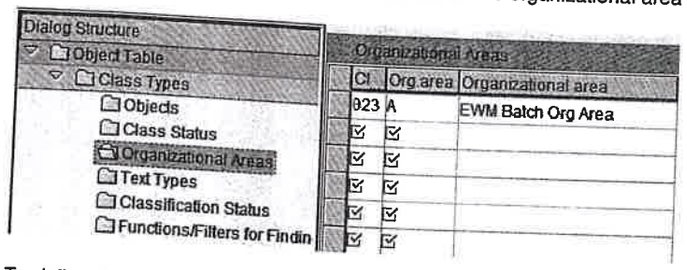
In general, the "Organizational Areas" indicator is used to group the batch characteristics by business like Purchasing, Engineering and so on. Here, this functionality is used to identify the EWM-related batch characteristics. This will be useful to filter the EWM-specific batch characteristics in the CIF integration model.

The "Organizational Areas" indicator defined for EWM must be assigned to the appropriate material classes as well as to the characteristics.

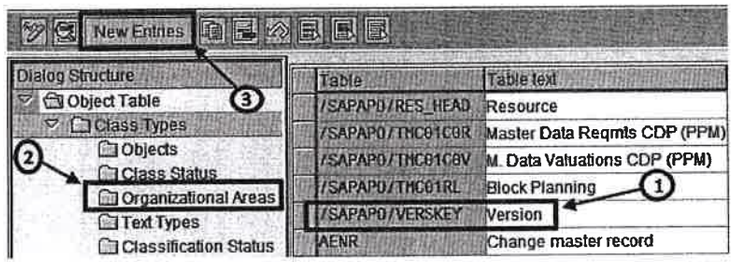
Menu Path (in ERP System): SPRO | IMG | Cross-Application Components | Classification System | Classes | Maintain Object Types and Class Types



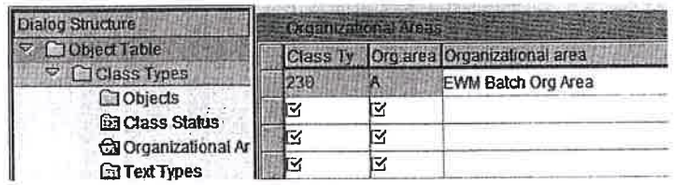
Here, select the table entry MCHA—Batch, and double-click on "Organizational Areas," click the "New Entries" button on the application toolbar, and define the organizational area for EWM in class type 023.



To define the organizational area in the EWM system, follow the menu path **SPRO | IMG | Cross-Application Components | Classification System | Classes | Maintain Object Types and Class Types**

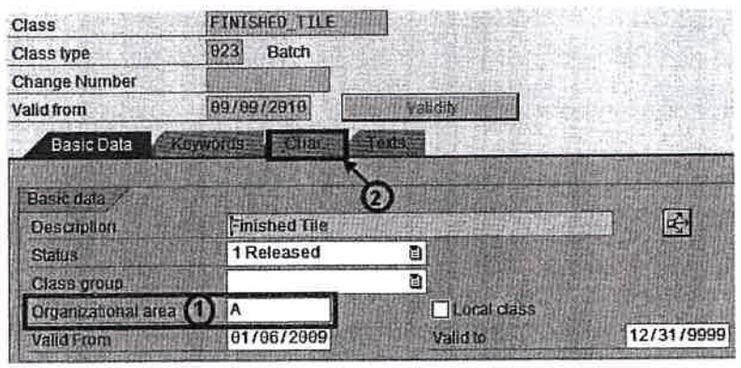


Here, select the table entry "version /SAPAPO/VERSKEY" double-click on "Organizational Areas," click on the "New Entries" button on the application toolbar, and define the organizational area for class type 230.



8.1.2 Assign Organizational Area to Class

In the ERP system, after the organizational area is defined, it has to be assigned to the appropriate classes (class type 023) and to the characteristics of the class as shown below. The TCode is CL02.



Basic Data | Keywords | Char. | Texts

Char.	Description	Data	N	D	Unit	R	Org. Areas
ROLLWIDTH_01	Roll Width	NUM	5	3	in		A
ROLLWIDTH	Roll Width	NUM	10	3	in		A ③
BATCH_NUMBER	Batch Number	CHAR	10	0			A
LOBM_HERKL	Country of Origin	CHAR	3	0			A
LOBM_VFDAT	Expiration date, shelf life	DATE	10	0			A
LOBM_ZUSTD	Status of Batch	CHAR	1	0			A
LOBM_HSDAT	Date when Batch Was Pro	DATE	10	0			A
LOBM_LVORM	Deletion Ind. for Batches	CHAR	1	0			A
LOBM_VERAB	Availability Date	DATE	10	0			A
LOBM_QNDAT	Next Insp. Date for Batch	DATE	10	0			A

Additionally, if the batches are to be managed with restricted or unrestricted status, it is necessary to add LOBM_ZUSTD batch characteristics to the class. This is required because in EWM, batch status is stored as part of batch characteristics. Characteristics LOBM_HERKL, LOBM_VFDAT, and LOBM_ZUSTD represent the stock attributes in the EWM system. Other available characteristics include the following:

Batch Characteristics
LOBM_HERKL - Country Of Origin
LOBM_VFDAT - Shelf Life Expiration Date
LOBM_ZUSTD - Status of Batch
LOBM_HSDAT – Production Date
LOBM_LVORM - Deletion Ind. for Batches
LOBM_VERAB - Availability Date
LOBM_QNDAT - Next Insp. Date for Batch

8.1.3 Define Number Range for Batch

Number range defined here is used to assign the batch number at the time of batch creation. IT should match ERP batch numbers. The EWM internal number range should be defined as an external ERP number range, and the EWM external number range should be defined as an internal ERP number range in the ERP system.

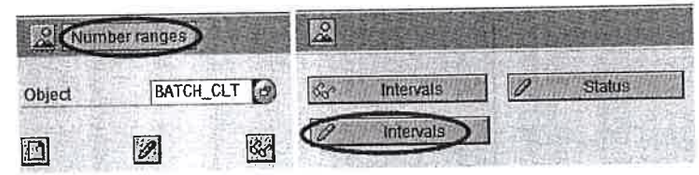
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Batch Management | Define Number Range for Batch

Intervals

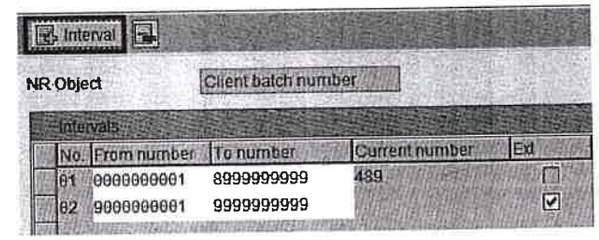
No.	From number	To number	Current number	Ext.
01	0000000001	8888888888		☑
02	9000000000	9999999999	0	☐

To define number ranges in the ERP system, follow the menu path **SPRO | IMG | Logistics – General | Batch Management | Batch Number Assignment | Maintain Internal Batch Number Assignment Range**

Here, enter the object type "BATCH_CLT," click on the "Number ranges" button on the application toolbar. In the number range intervals screen, click on the "Change Intervals" button to enter or change the existing number range.



In the "maintain number range interval" screen, define the internal and external number, range as explained above.

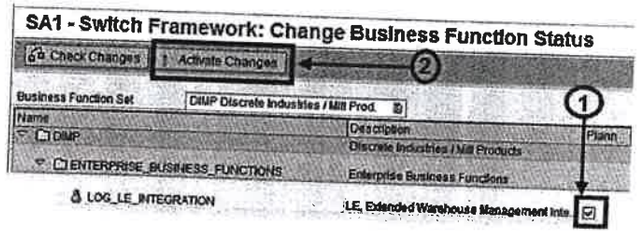


8.1.4 Activate the LOG_LE_INTEGRATION Business Function in ERP

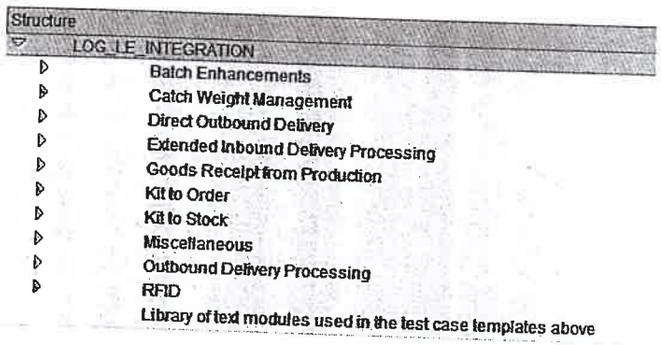
In order to work batch management properly in EWM, it is necessary to check the "BatchDetEW" checkbox in the "Maintain Extended WM-Specific Parameters" in the ERP system for your warehouse. As of ECC 6.0 EHP 3.0, this configuration is not available unless the LOG_LE_INTEGRATION business function is activated in Switch Framework (TCode SFW5).

To activate this business function, login to the ERP system, enter TCode SFW5, click on ENTERPRISE_BUSINESS_FUNCTIONS, locate object LOG_LE_INTEGRATION, check the checkbox in the "Planned Status" column, and click on the "Activate" button. This will create a background job

and might take several hours to complete. Once this job is executed successfully, a new column "BatchDetEW" will be displayed in the **Maintain Extended WM-Specific Parameters** configuration menu. If this object is already active in the ERP system, there will be no checkbox displayed in the "Planned Status" column for object LOG_LE_INTEGRATION. In this case, no further activation is required.



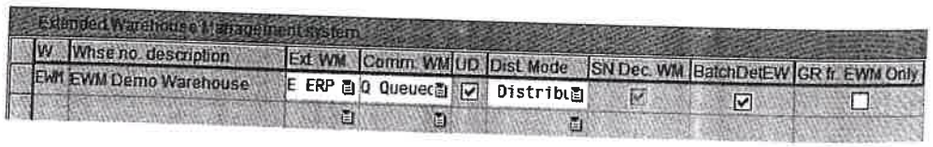
This will activate the following functionalities in ERP system:



8.1.5 Maintain EWM-Specific Parameters

After activating the LOG_LE_INTEGRATION object, the "BatchDetEW" checkbox must be checked in the "Maintain Extended WM-Specific Parameters" menu.

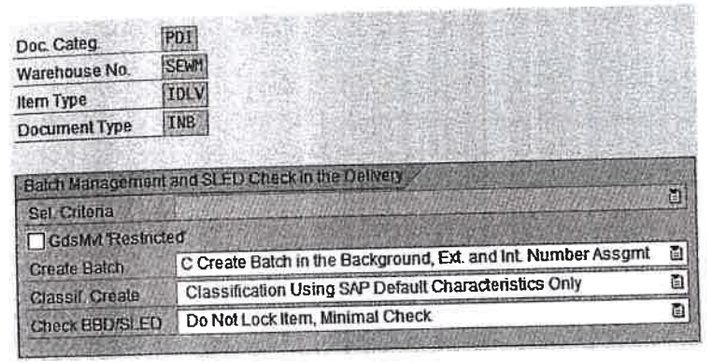
Menu Path: SPRO | IMG | Logistics Execution | Service Parts Management (SPM) | Integrate SPM with Other Components | Maintain Extended WM-Specific Parameters



8.1.6 Setting for New Batches

This configuration specifies how the batch will be created and the criteria to display on the classification screen at the time of new batch creation.

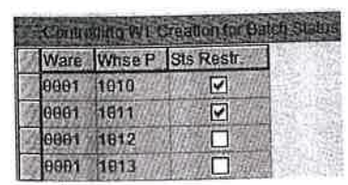
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Batch Management | Make Setting for Delivery



8.1.7 Settings for WT Creation

This specifies what the batch status should be for the WPT. The status defined in the WPT will be copied to the WTs at the time of WT creation. If the "Sts Restr." check box is checked, the system will always post the batch into restricted status.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Batch Management | Batch Status Management | Settings for Warehouse Task Creation



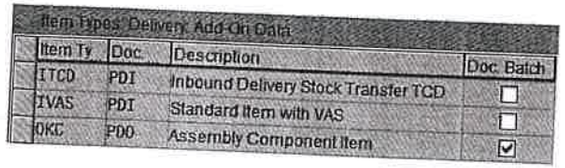
8.1.8 Activate Documentary Batch in EWM

Documentary batches are more useful for tracking purposes. Batches that are classified as a documentary batch are not inventory managed by the system. Hence, not all of the functionalities of

batch management can be used. The system creates a documentary batch as additional information prior to goods receipt. This additional information is then located in the batch field of inbound or outbound delivery.

In this configuration, for the combination of item type and document category, activate the documentary batch management. This enables the tracing of a product without having to manage the stock of the product in batches.

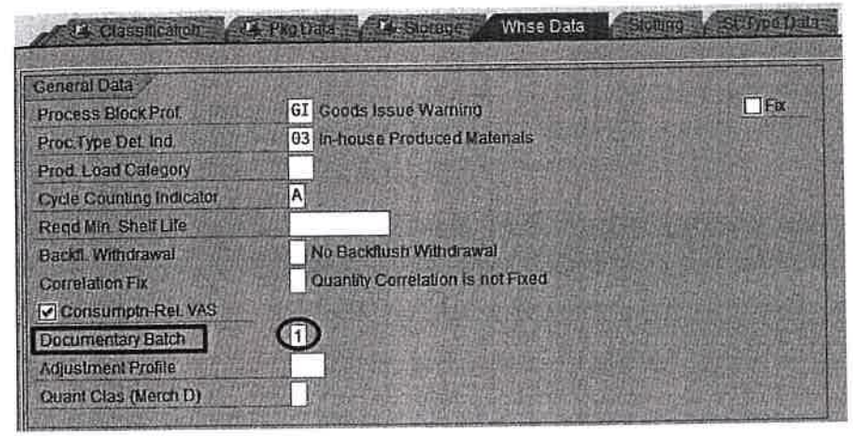
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Batch Management | Set Documentary Batch



8.1.9 Activate Documentary Batch In Product Master

After activating documentary batch management in the EWM system, it must also be activated for the products by setting the value "1" in the "Documentary Batch" field in the "Whse Data" view of the product master data (TCode /SCWM/MAT1). Only then can documentary batch numbers be maintained for products in the inbound and outbound delivery.

It is also possible to specify documentary batch numbers at the time of WT task creation. If it is specified in the WT, the operator has to confirm or enter the documentary batch at the time of WT confirmation or putaway confirmation.



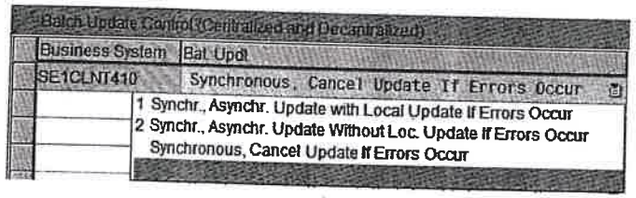
8.1.10 Distribute Documentary Batch Settings from ERP

In ERP, documentary batch can be activated in the configuration (**SPRO | IMG| Logistics – General | Batch Management | Documentary Batches**) and can be distributed to EWM system. Since documentary batch management is not activated at material level this information cannot be transferred as part of CIF. In EWM, TCode **/SCWM/DBATCHSYNC (SAP easy access menu | Extended Warehouse Management | Master Data | Product | Synchronize ERP/EWM Settings for Documentation Batches**) can be used to pull the required information from ERP and update the product master automatically. This transaction can be executed online or in background.

8.1.11 Define Update Control for Batches

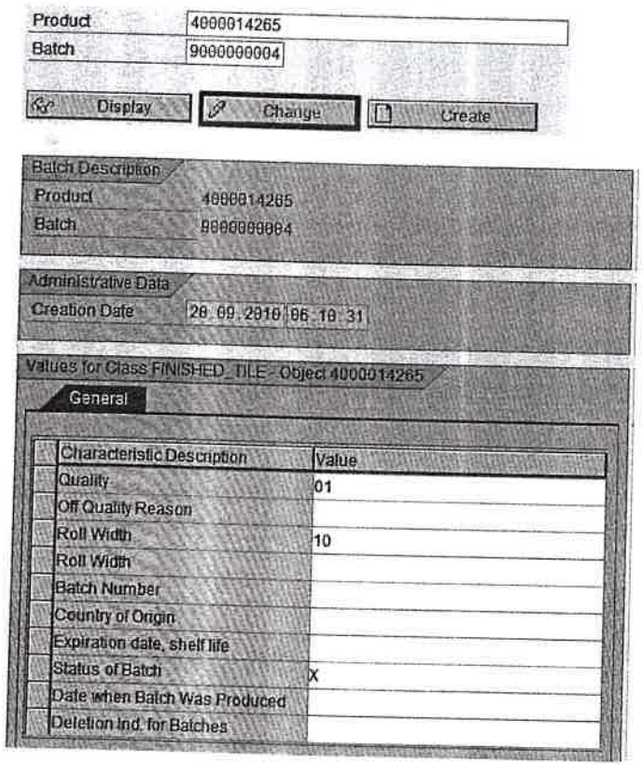
Whenever there is a change to the existing batch, or a new batch is created in EWM, the system will automatically make a call to the ERP system to transfer the data in real time. In case of any error (like unavailability of the ERP system, the batch is locked by another application, and so on), the system will display an error to the user. To avoid such interruptions, the update control value can be set to 1 or 2.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Batch Management | Set Update Control (Centralized, Decentralized)



8.1.12 Create Batches for Products

In EWM system, TCode /SCWM/WM_BATCH_MAINT can be used to update or create a new batch for products.



8.1.13 Batches In Goods Receipt Process

In ERP, if a batch number is specified in an inbound delivery, the same will be transferred to the EWM system as part of the delivery item. If batch data is not transferred to the EWM system, it can be created manually in the foreground or automatically in the background (internal number range used) at the time of inbound delivery creation. Once the batch master is created, the products can be put away in the warehouse.

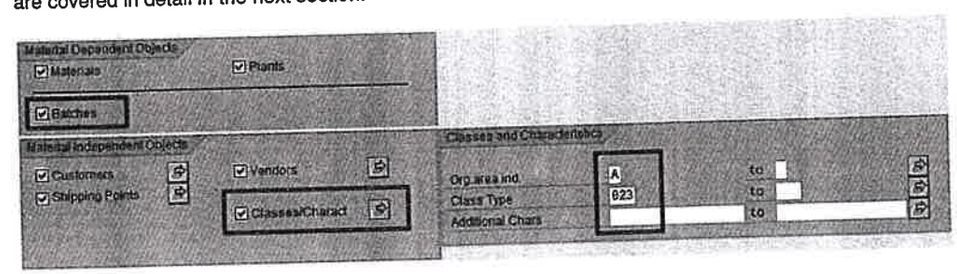
8.1.14 Batches In Goods Issue Process

Picking of batches in EWM can be initiated in the following two ways:

- Specify a batch in the ERP outbound delivery and pick the specified batch in the EWM system. In case of a batch split in EWM, it will be communicated back to the ERP system, and the outbound delivery will be updated.
- Specify batch selection criteria in the ERP outbound delivery (for example, specify the value for one of the batch characteristics). This information will be transferred to the EWM system along with outbound delivery, which will be used to determine the appropriate batch for the picking WT. A batch can be manually specified in the WT, instead of the system deciding on the batch. In such a scenario, the system will ensure that the selection criteria mentioned in the outbound delivery are met. If multiple batches are picked to satisfy the delivery quantity, a batch split will be initiated and updated in the ERP outbound delivery.

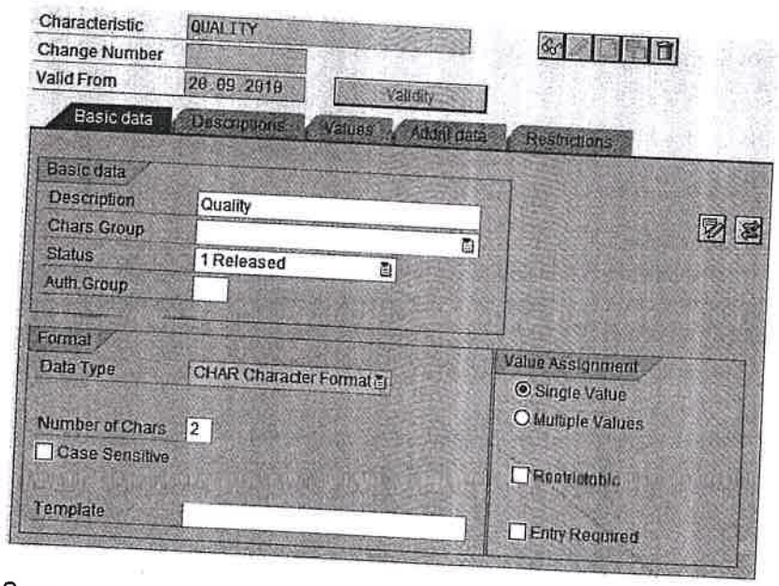
8.1.15 CIF Batch-Specific Data from ERP to EWM

The batch classes and characteristics defined in the ERP system should be transferred to the EWM system as part of CIF transfer. In the CIF integration model (TCodes CFM1, CFM2), select "Batches" and "Classes/Characteristics" as shown in the following screenshot. Organization area indicator and class 023 can be used in the filter data option to filter the EWM specific data. CIF integration models are covered in detail in the next section.



8.1.16 Verify Classes and Classification Data

In the EWM system, after the data transfer, verify the transferred characteristics in TCode CT04 and classes in TCode CL02.



Summary

This chapter has explained batch management functionality in EWM. It has also covered the configuration required in both ERP and EWM systems to create and transfer batch-related information from one system to another. The next chapter will discuss handling units and packaging specifications.

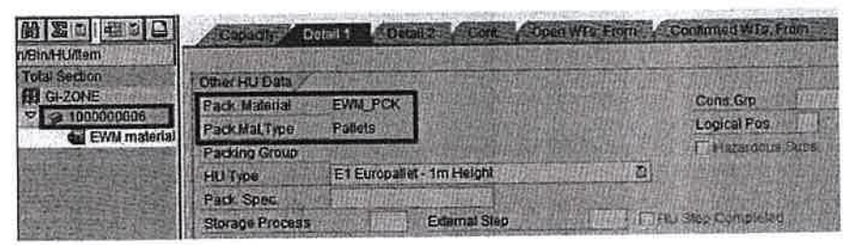
Chapter 9: HUs and Packaging Specifications

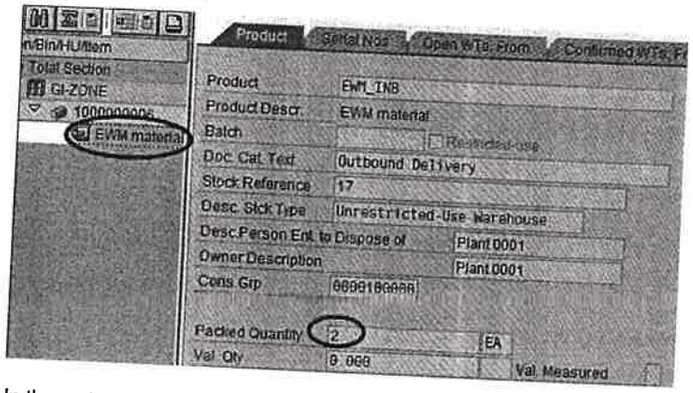
In EWM, HUs and packaging specifications are essential for certain types of picking and putaway processes in the warehouse. The topics covered in this chapter include the configuration of HUs, packaging specifications, and how to set up the master data for the packaging specifications in the EWM system.

9.1 Handling Units

An HU is a physical unit consisting of packaging materials (load carriers/packing material) and the goods contained on/in it. It is usually created with a combination of products and packaging materials. It has a unique, scannable identification number that can be generated by the system, or it can be specified externally. The HU ID can be constructed according to industry standards such as EAN 128 or SSCC.

In the warehouse, it is a required feature for some of the process like process-oriented putaways, layout-oriented putaways, value added services, and so on. It contains attributes like identification number, dimension, weight, volume, status, products, quantity, packaging material, and packaging specifications. HU contents can be broadly categorized as header data and item data. Header data contains information like HU ID, packaging materials, packaging material type, and so on. Item data contains the details of the products, qty packed, and so on.





In the system, the action of creating a HU is called "packing." The process to remove the products from HU is called "unpacking." At the time of packing, a unique ID can be explicitly assigned, or the system can internally assign one for the HU, called an HU number.

To create HUs in the warehouse, warehouse product master data must exist for packaging materials, and the "Pkg Data" view must be maintained. The HUs created in the warehouse can be used temporarily only for internal processes and can be deleted when the products are finally put away in the bin or can be retained in the bin and used at the time picking, depending on the storage type settings. They can also be communicated to the ERP outbound delivery at the time of post goods issue (PGI). In order to retain HU numbers in the warehouse bin, storage type should be configured to allow HUs. In case of yard and transportation management, HU IDs are created internally by the system, which represents the vehicle and the content.

Table 9.1A provides an overview of the HU configuration. The number range configuration is not transportable automatically and may be required to maintain every client.

9.1A HU Configuration

S. No	Configuration Check List	TCode	Transportable
1	Define Number Range for HU Identification	SPRO	No
2	Define Packaging Material Types	SPRO	Yes
3	Assign Number Range Intervals to Packaging Material Types	SPRO	Yes
4	Define Packing Groups for Products	SPRO	Yes
5	Maintain Allowed Packaging Material Types for Packing Group	SPRO	Yes
6	Define HU Types	SPRO	Yes
7	Define HU Type Groups	SPRO	Yes
8	Assign Default HU Type and HU Group for Warehouse	SPRO	Yes
9	Define HU Types for Each Storage Type	SPRO	Yes

9.1.1 Define Number Range for HU Identification

In order to create handling units in the warehouse, the number ranges for HUs must be defined and assigned to the packaging material types. To avoid errors during the data transfer, the internal number ranges of EWM should be defined as external number ranges in ERP, and internal number ranges of the ERP system should be defined as external number ranges in the EWM system.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Handling Units| External Identification | Define Number Range for HU Identification

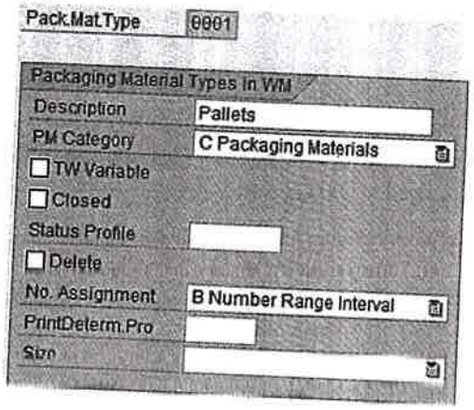
9.1.2 Define Packaging Material Types

The packaging material type groups the packaging materials and contains the settings that are valid for the relevant packaging material. The system uses the number range assigned to the packaging material type to generate the HU number.

The controls available in packaging material types include the following:

- **Packaging material category**: The packaging material category specifies the type of packaging material that this packaging material type is. Examples include auxiliary types, vehicle, transportation unit, and so on. The auxiliary packaging material category cannot be used to generate HU number. It is used to categorize packaging material like plastic wrap, box lids which are not used as the main packaging materials. The most widely used category is "C Packaging Materials."
- **Variable tare weight**: This indicates that the tare weight of a packaging material is variable. This means that the tare weight is adjusted when the total weight of a handling unit changes.
- **Number assignment**: The type of number range assigned here controls the generation of the HU number when a handling unit is created with this packaging material type.
- **Closed**: Indicates whether the packaging material is a closed package.
- **Status profile**: Can be used to assign a custom user status profile for better control of handling unit usage.
- **Print Determ. Pro**: This is used for printing the HU.
- **Size**: Max. number of nesting allowed for HU.
- **Delete**: Indicates how the system is designed to manage empty HUs. This indicator controls whether
  - i. The bin also becomes empty: This is recommended for pallets and boxes that, in principle, no longer occupy the bin when they are empty.
  - ii. The bin is still occupied by the empty HU and must first be emptied by a WT.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Handling Units| Basics | Define Packaging Material Types



9.1.3 Assign Number Range Intervals to Packaging Material Types

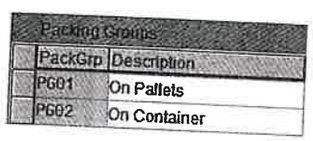
In order to generate HU numbers in the packing process, internal or external number ranges must be assigned to the packaging material type. For an external number range, the user has to specify the HU number. With an internal number range, the system will automatically assign a HU number at the time of packing.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Handling Units| External Identification | Assign Number Range Intervals to Packaging Material Types

9.1.4 Define Packing Groups for Products

Packing group refers to the grouping of products that have similar packing requirements. The values defined here will be used in the product master data in the "Basic Data: Pack under Pkg Data view" section.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Handling Units| Basics | Define Packing Groups for Products



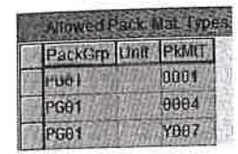
Packing Groups

PackGrp	Description
PG01	On Pallets
PG02	On Container

9.1.5 Maintain Allowed Packaging Material Types for Packing Group

This specifies what packaging material types are allowed for each packing group. At the time of packing, the system checks if the entered packaging material is allowed for the product based on the packing group specified in the product master.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Handling Units| Basics | Maintain Allowed Packaging Material Types for Packing Group



Allowed Pack. Mat. Types

PackGrp	Unit	PkMT
PG01		0001
PG01		0004
PG01		Y007

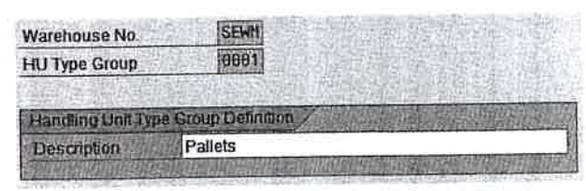
9.1.6 Define HU Types

HU types are discussed in detail in chapters 4 and 6. In the EWM system, they can be defined in SPRO **| IMG | Extended Warehouse Management | Cross-Process Settings | Handling Units | Basics | Define HU Types**

9.1.7 Define HU Type Groups

HU type groups can be used to group together similar HU types. They are used as an optional parameter in slotting. During putaway, an HU type check can be activated at the storage-type level. To determine a deconsolidation station, all HU types used must be assigned to the HU type group. HU type groups are mandatory for resource management.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Handling Units| Basics | Define HU Type Groups



9.1.8 Assign Default HU Type and HU Group for Warehouse

Here, the default HU type and HU group is assigned to a warehouse.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Handling Units| Basics | Define HU Types for Each Warehouse Number and Assign HU Type Group

Here, enter the warehouse number, HU type, and HU type group.

Warehouse No.	SEWM
HU Type	E1

Handling Unit Types per Warehouse Number	
HU Type Descr.	Europallet - 1m Height
UoM Load Cat.	
Description	
HU Type Group	0001

9.1.9 Define HU Types for Each Storage Type

This menu defines the allowed HU types for each storage type. In EWM, the total number of permitted HU types for a storage type is 30. This configuration is required only if the HU type check box is active in the storage type.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Handling Units| Basics | Define HU Types for Each Storage Type

HU Types per Storage Type

	WhN	Typ	HU Ty	HU Ty	HU Ty	HU Ty	HU Ty
	SEWM	0005	E1	E2			
	SEWM	0001	E1	E2	STPL	WDPL	

9.2 Packaging Specifications

Packaging specifications are another set of important master data in EWM. This is used to define the packing requirements for products to be put away and transported. Internally, the packing specifications use the Integrated Product and Process Engineering (iPPE) engine to store the packing specifications. Once they are configured, a condition technique is used to determine its application. Other than EWM, supplier network collaboration (SNC) and service parts planning applications also use the packaging specifications for automatic HU creation, for inbound delivery in SNC and in rounding rules in service parts planning.

Table 9.2A shows an overview of the usage, structure, and configuration of packaging specifications.

9.2A Packaging Specification Configuration

S. No	Configuration Check List	TCode	Transportable
1	Usage of the Packaging Specifications	N/A	N/A
2	Packaging Specification Structure	N/A	N/A
3	Define Number Range for Packaging Specification	SPRO	No
4	Define General Packaging Specification Parameters	SPRO	Yes
5	Define Work Step Type	SPRO	Yes
6	Assign Work Step Type to Packaging Material Type	SPRO	Yes
7	Define Level Type	SPRO	Yes
8	Define Element Type	SPRO	Yes
9	Assign Packaging Material Type to Element Type	SPRO	Yes
10	Define Level Set	SPRO	Yes
11	Define Packaging Specification Group	SPRO	Yes
12	Define Access Sequences	SPRO	Yes
13	Define Condition Types	SPRO	Yes
14	Define Determination Procedure	SPRO	Yes
15	Create Condition Maintenance Group	SPRO	Yes
16	Create Packaging Specification	SPRO	Yes
17	Determination of Packaging Specification	SPRO	Yes

9.2.1 Usage of Packaging Specifications

In EWM, packaging specifications can be used not only to determine how the products should be palletized; but also they can also be used extensively in the packing process to provide information on how products should be packed into HUs, what packaging and auxiliary materials to use, how much qty, and so on. This information can also be printed as instructions to the operator.

In EWM, packaging specifications are used in the following processes:

i. Automatic packing for inbound delivery
ii. Packing in the work center
iii. Packing during putaway and picking WTs confirmation
iv. Slotting
v. Packaging material determination in the WO creation, or during deconsolidation.
vi. Palletization
vii. Packing using RF framework
viii. Deconsolidation using RF framework

One of the most common usages of packaging specifications is to specify how products are palletized in the warehouse. For example, in electronic goods storage warehouse, printing and labeling a pallet ID for, say, refrigerators may not add much value to the warehouse. But the palletization of refrigerators may be important and can influence how many refrigerators can be assigned to the storage bin and how many WTs should be created during the putaway process. For example, if one qty of refrigerator per pallet is specified, but fifty quantities is received, the system will determine fifty bins and split the quantity into fifty WTs.

Most importantly, the introduction of a good deal of flexibility into the packaging specification determination helps the warehouse in many ways. Using the condition techniques, a warehouse can decide how the same product should be packed or palletized differently for different customers, vendors, and so on. It also resolves one of the known limitations of the storage unit: a maximum of three different types of palletization data can be defined in WM view 2 in the material master.

The following section will cover the structure and configuration of packaging specification and HU in detail.

9.2.2 Packaging Specification Structure

It is important to understand the structure of packaging specifications before they are configured in the EWM system. The main components of packaging specification structure are header, contents, levels, element group, elements, packaging materials, and the steps. Diagram 9.1.2A makes the structure easy to understand.

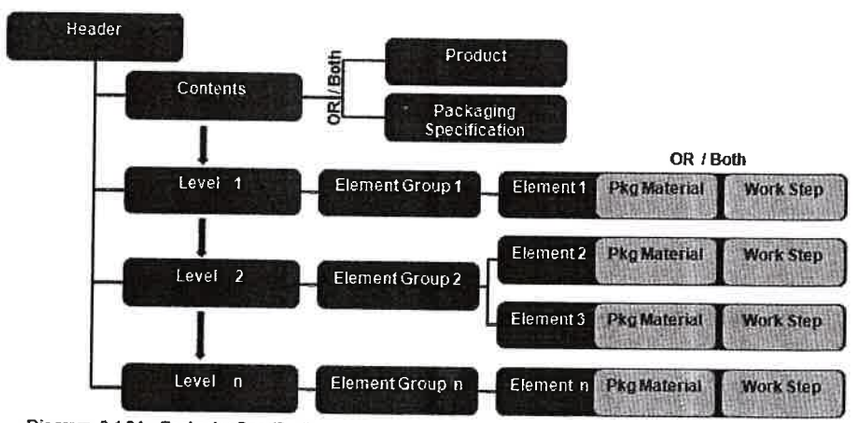


Diagram 9.1.2A–Packaging Specification

There can be many levels in the packaging specification.

Header: The header contains information like name, description, status, and other administrative information such as the user who created it, creation date and so on.

Content: The content can contain only the product (or products) to be packed or a reference to another packing specification or both.

Level: Packaging specifications can have one or more levels. Each level contains the overall instructions for packing a previous level. If the current level is the first level in a packaging specification, the level quantity describes the number of units that should be packed in this level.

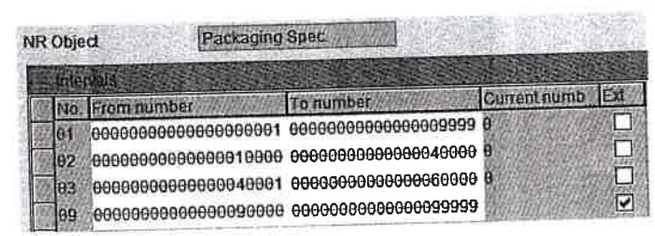
Element Group: Each level consists of only one element group. The element group can have more than one element. Element groups can be created separately and assigned to the packaging specifications or can be defined at the time of creating packaging specifications. Elements groups, once created, can be reused in multiple packaging specifications.

Elements: An element can consist of packaging material, a work step, or both. Packaging materials have to be defined as products in EWM systems. Work steps can be simply texts or instructions for packing defined with a code, which can be reused in other packing specifications. In EWM, work steps can be defined separately and assigned in many packaging specifications.

9.2.3 Define Number Range for Packaging Specification

In EWM, every packaging specification is stored with a unique identification number. This identification number can be entered manually, or the system can generate it automatically when the packaging specifications are created from the internal number range. The same rule applies to element group and work steps. Hence, it is necessary to decide what will be the number ranges. If necessary, up to three different sets of number ranges can be defined (i.e., one for element group, one for work step, and one for packaging specification), or one number range can be used for all three.

Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Define Number Range for Packaging Specification



9.2.4 Define General Packaging Specification Parameters

The previous menu showed how to define a number range. In this menu, that number range is assigned to the work step and element group. Here, the form name can also be assigned to print the packaging specifications.

Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Define General Packaging Specification Parameters

Global attributes for packaging specifications

NR Work Step	02
NR Elem. Group	03
Max.Rows	900
Alert Category	SCM_ANOT
Form Name	
PDF form name	
Document MS	
Document Object	

☑ Save Det. Analysis
☑ Change Documents

9.2.5 Define Work Step Type

As mentioned earlier, work steps can be either instructions or certain actions in the packing activity. The work step types ensure a logical grouping of work steps. Each work step can be assigned to exactly one work step type. This means that similar work steps can be assigned to the same work step type. The work step type can be used to restrict permissions of work steps for a packaging material. These permissions are ensured by assigning work steps to packaging material types.

Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Structure of Packaging Specification | Define Work Step Type

Customizing Work Step Type

Work Step Type	Description
0001	Plan Packing
0002	Packing

9.2.6 Assign Work Step Type to Packaging Material Type

Permitted work step types can be assigned to a packaging material type. The system takes this assignment into account during maintenance of packing instructions. Several work step types can be assigned to a packaging material type. If no work steps are assigned to a packaging material type, then all work step types are permitted during maintenance of a level element in a packing instruction, a packaging material from the given packaging material type is being used.

Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Structure of Packaging Specification | Assign Work Step Type to Packaging Material Type

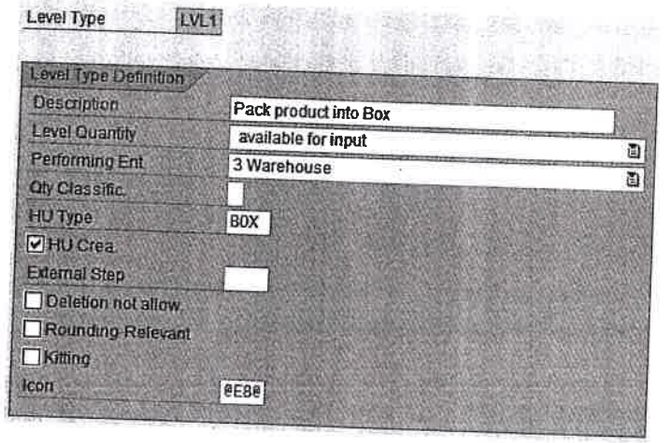
Assign Work Step Type to Packaging Material Type

PkMtT	Description	Wor	Description
Y001	Box	0001	Plan Packing
Y001	Box	0002	Packing

9.2.7 Define Level Type

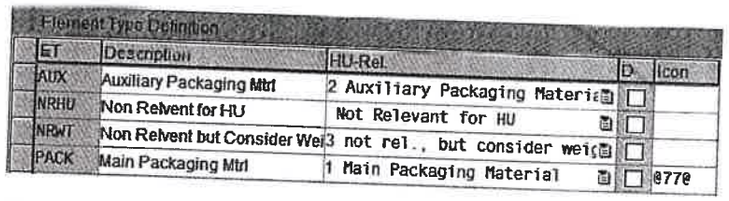
Level type is essential for creating a level set. It consists of settings for level qty, performing entity, HU type, and HU creation. If the current level is the first level in a packaging specification, the level quantity describes the number of units that should be packed in this level. Here, also it can be specified whether a level of this type can be deleted in a packaging specification. An icon can be used to display the symbol for a level of this level type on the packaging specification user interface.

Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Structure of Packaging Specification | Define Level Type



9.2.8 Define Element Type

An element type is also required to create a level set. Here, we can specify "HU relevancy", "Icon", and "Delete" indicator "i.e " whether this element can be deleted from the packaging specification. HU relevancy in the element type guides whether or not the system can create a HU number during packing.

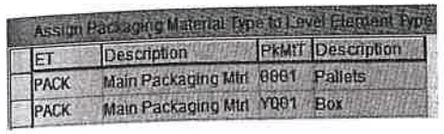


Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Structure of Packaging Specification | Define Element Type

9.2.9 Assign Packaging Material Type to Element Type

This makes it possible to assign more than one packaging material type to an element type. If packaging material types are assigned to an element type, then only packaging materials that belong to these packaging material types are valid for this level element in a packing instruction. If no packaging material types are assigned to an element type, then all packaging materials are valid in the level element.

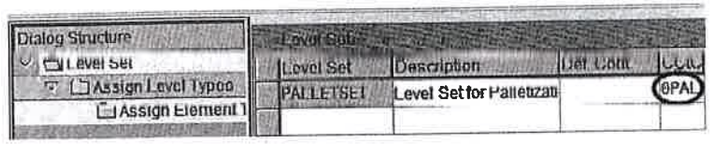
Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Structure of Packaging Specification | Assign Packaging Material Type to Element Type

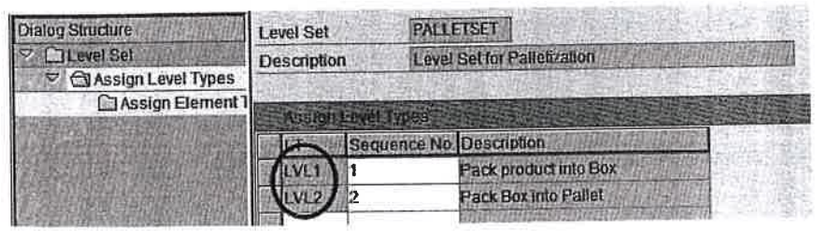


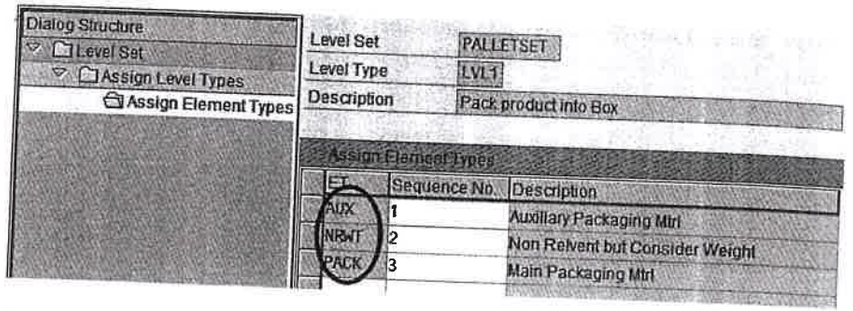
9.2.10 Define Level Set

A level set defines the structure of a packaging specification. It consists of level types and element types. It enables us to predefine a uniform structure for packaging specifications in their system. If a user creates a packaging specification with reference to the level set, the system adopts all the default values of the level set to the newly created packaging specification.

Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Structure of Packaging Specification | Define Level Set





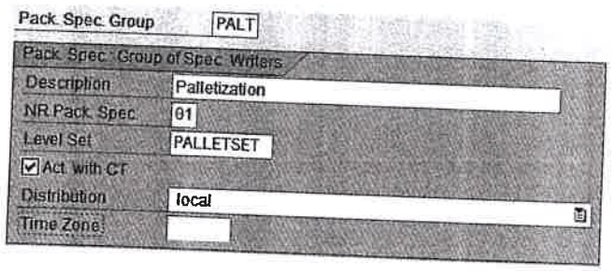


9.2.11 Define Packaging Specification Group

A group consists of a description, the assignment of a number range interval, and a level set. It is used in the authorization object for packaging specifications. The system will use the number range assigned here to uniquely identify each packaging specifications. In case the number range is internal, the system will automatically assign the number from the number range. If it is external, the user has to specify manually at the time of packing.

Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Define Packaging Specification Group

Here, enter the group name; assign the number range and level set and check the "Act. With CT" check box "ON" to respect the condition types.



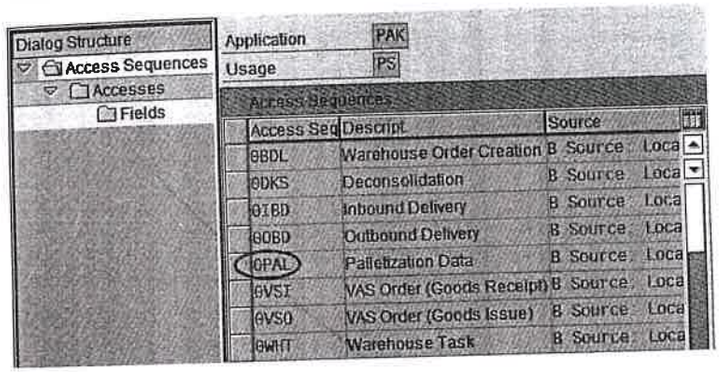
9.2.12 Define Access Sequences

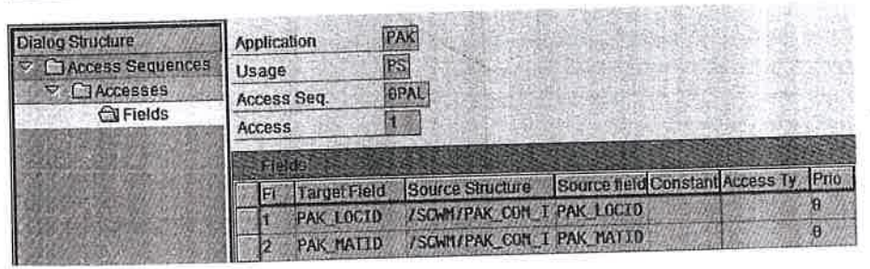
The access sequence is a search strategy that the SAP system uses to search for valid determination records for a packing instruction condition type. Each condition table contains a particular combination of fields that the system uses to search for the condition records. The search sequence should go from specific to general condition records.

For example, in packaging specification determination, it can be set up so that the SAP system first searches for a packing instruction, using only the combination of product and supply chain unit. If no results found, then system can search packing instruction specific for the product.

Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Structure of Packaging Specification | Define Access Sequences

SAP has delivered access sequences for each of the areas. Users can define these manually or use those delivered by SAP. For palletization, the SAP-delivered access sequence is 0PAL—Palletization Data.





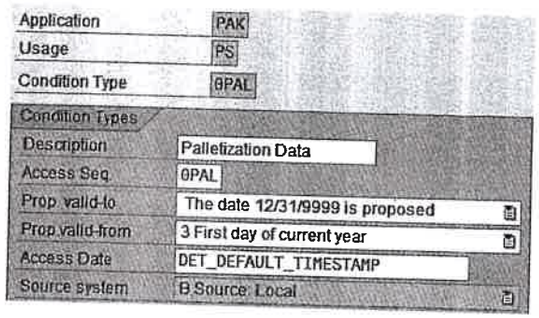
Notes:

The SAP-delivered application for packing is "PAK—Pack. Specification," and the usage is "PS—Packaging Specification." Access sequence, condition types, and determination procedure have to be maintained for both application (PAK) and usage (PS).

9.2.13 Define Condition Types

The condition type is used in SAP for different functions like pricing, output type determination, packaging specification determination, and so on. Under packaging specification, it is used to determine the level set for the product that needs to be packed based on access sequence and condition records maintained in the system. The access sequence contains a list of accesses to condition tables. The condition tables are searched to find the right key combination.

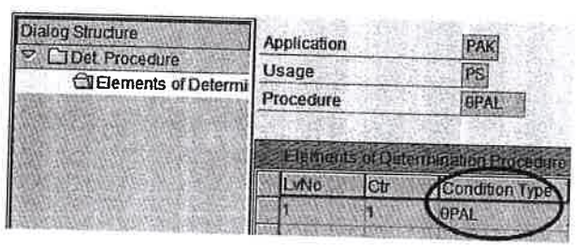
Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Structure of Packaging Specification | Define Condition Types



9.2.14 Define Determination Procedure

Packaging specification determination procedure defines which condition types are taken into account and in which order. When determining the packaging specification, the system automatically determines which procedure is valid for a business transaction and takes into account the condition types contained within, one after the other.

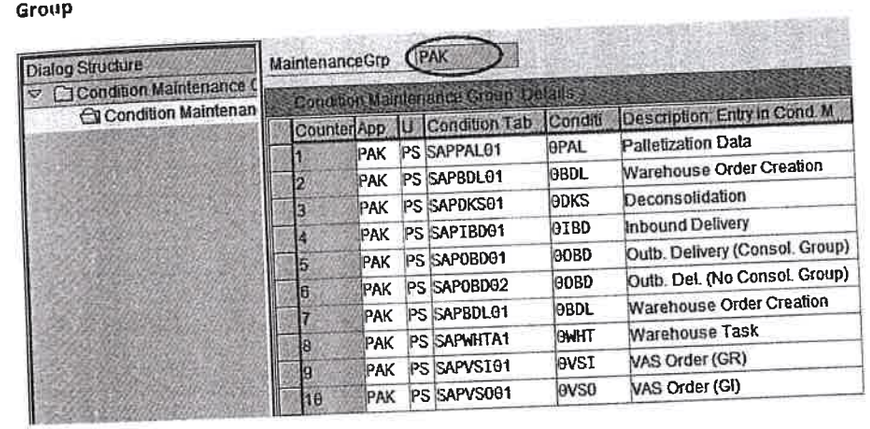
Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Determination of Packaging Specifications | Define Determination Procedure



9.2.15 Create Condition Maintenance Group (CMG)

The CMG groups together the condition tables and condition types for condition maintenance. SAP delivered CMG is PAK—Packing Instruction. Here, the application, usage, condition table, and condition types are registered.

Menu Path: SPRO | Extended Warehouse Management | Master Data | Packaging Specification | Determination of Packaging Specifications | Create Condition Maintenance Group



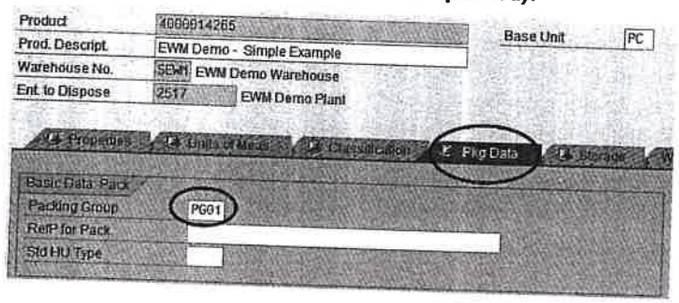
9.2.16 Create Packaging Specifications

The above described configuration maintains the required master data for the packaging specification. This section will cover the master data requirement for packaging specifications. Most of the transactions explained below are not available under SPRO menu. They are part of master data and have to be maintained in the SAP easy access menu.

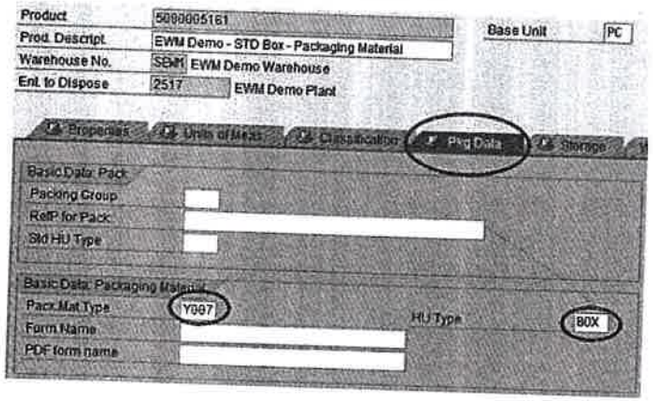
9.2.16.1 Maintain Packaging Data in Product Master

In order to create packaging specifications, users have to maintain packing groups for products that get packed. In the packaging material, users have to maintain packaging material type and HU type. Following screenshots displays the products master data for packaging and finished products (TCode /SCWM/MAT1).

Master data for product (that needs to be packed):



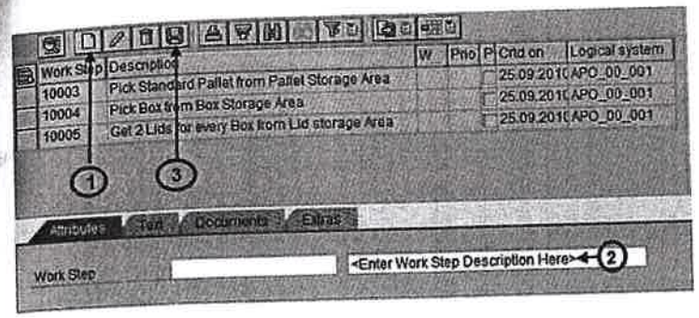
Product master data for packaging material:



9.2.16.2 Maintain Packaging Work Step

Work steps are another type of master data used in packaging specification. They can be created in menu path **SAP Easy Access | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Packaging Work Step or using TCode /SCWM/PSWORKSTEP**

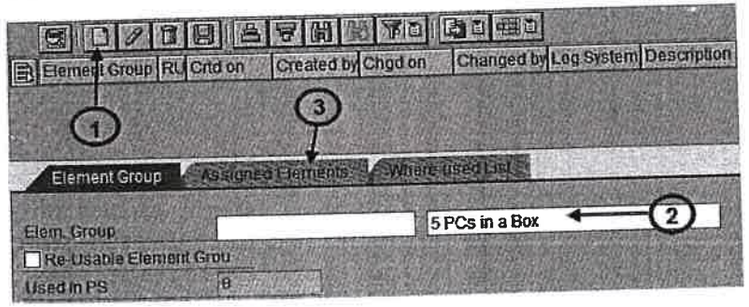
If the number range assigned to the work step is an external number range, both the work step ID and the work step description must be entered.



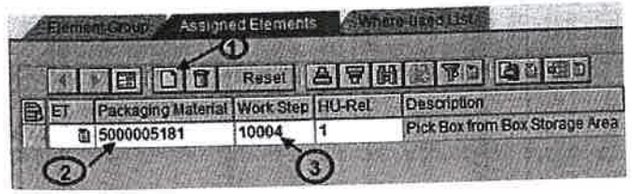
9.2.16.3 Maintain Level Element Group

Once element groups have been created, they can be reused in multiple packaging specifications. In EWM, element groups can be created in menu path **SAP Easy Access | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Level Element Group or using TCode /SCWM/PSEG.**

If the number range assigned to an element group is external, both the element group ID and element group description must be entered.



Under "Assigned Elements" tab, enter the element type, packaging material, and work step.

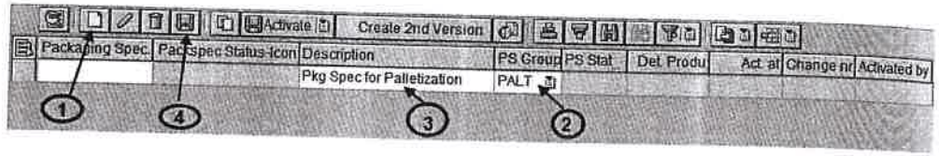


9.2.16.4 Maintain Packaging Specification

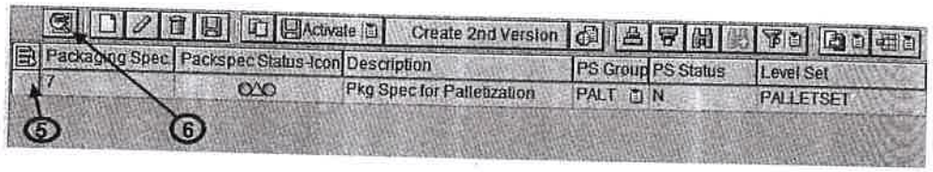
Packaging specifications can be created in maintain packaging specification transaction.

Menu path: SAP Easy Access | Extended Warehouse Management | Master Data | Packaging Specification | Maintain Packaging Specification (TCode /SCWM/PACKSPEC)

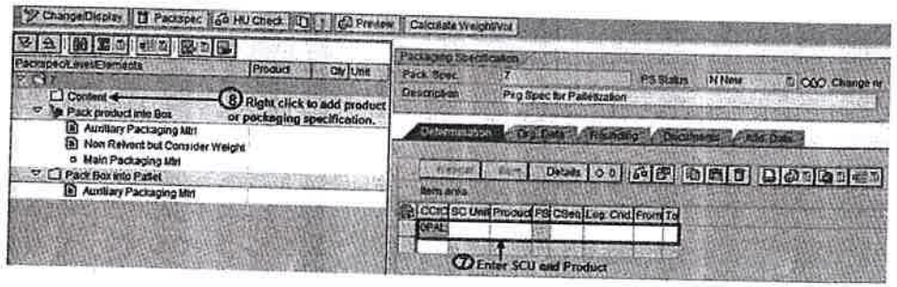
Here, click on "add new line," select the appropriate PS Group, enter description, and click "Save." This will create a packaging specification with a unique ID.



Now, select the packaging specification line and click on the "Details" or "Change" button to maintain the content.

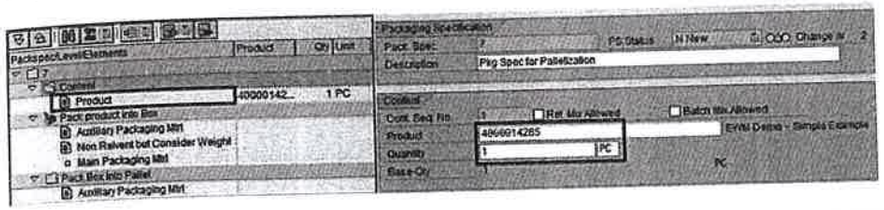


In the determination tab, select the appropriate condition type and enter the appropriate details, like SCU, product, condition sequence, and validity. Hit the "Enter" key to add more records.

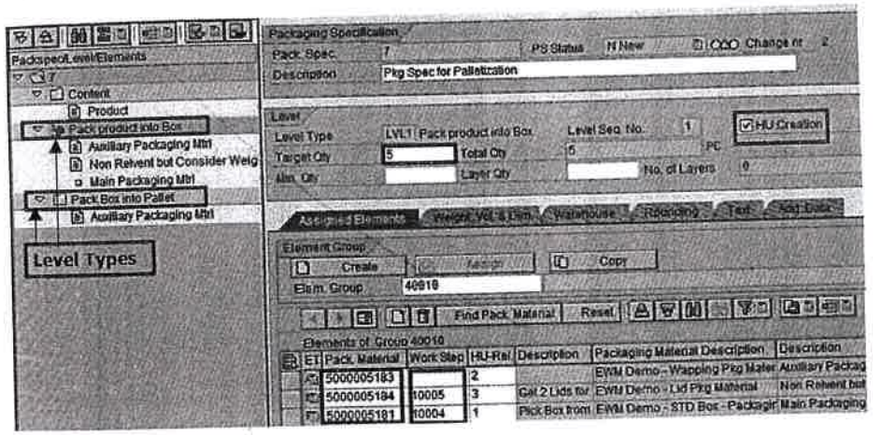


Right-click on the "Content" folder icon and select the product content or packaging specification option. This will add a new option called "Product" or "Packaging specification" under the content folder.

Expand the content to see the added content. Click on the product line under the content folder; enter the product number and the qty that needs to be packed, and click "Save."



To add level content, double click on the level type. Add the target qty i.e. the pack qty, enter packaging material and or work step. Click "Save." If there are multiple level types in the packaging specification, repeat the instructions in this step for other level types.



9.2.16.5 Activate Packaging Specification

Once all the data is maintained in the packaging specification (TCode /SCWM/PACKSPEC), click on Activate/Deactivate button on the application toolbar.

After activating the packaging specification, to change the content, the packaging specification must be deactivated (click on the "Activate/Deactivate" icon on the application toolbar), and a new version of the

packaging specification must be created (click on the "Create 2nd Version" button on the application toolbar). After completing the changes, click "Activate" to activate the packaging specification.

9.2.16.6 Condition Maintenance

To use the packaging specifications, maintain the condition records in TCode /SCWM/PSCT6. Here, select the condition type, enter SCU and product number, select the packaging specification, and enter the validity period.

9.2.17 Packaging Specifications Determination Diagram

To determine when the packaging specification is to be applied, the condition technique is used. As seen in the condition maintenance group, it is necessary to assign a conditional table and condition type to the application code "PAK" and usage code "PS," which helps the EWM system to know that the objects assigned are used in packaging specification determination.

Diagram 9.2.17A demonstrates how different configuration objects are linked and how they are determined at the time of creation of the packaging specification.

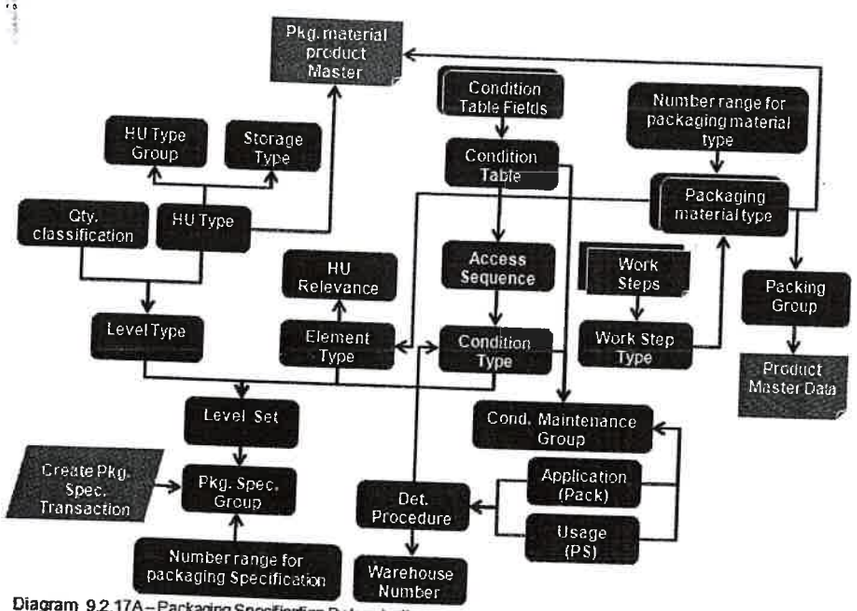


Diagram 9.2.17A – Packaging Specification Determination

Summary

This chapter has demonstrated how to configure HUs and packaging specifications and how to maintain required master data for packaging specifications. The data maintained here will be used later in the goods receipts (GR) and putaway chapter to palletize the GR products and create the HUs.

Chapter 10: EWM Documents

In this chapter the various documents used in the EWM system will be discussed. These documents are usually triggered during inbound, outbound, and internal warehouse processes. It is important for consultants to understand what these documents are, where they are used, and what information they contain. Table 10A is an overview of different documents used in EWM system during different processes.

S. No	Warehouse Documents	System	Process
1	Inbound Delivery Notification	EWM	Inbound
2	Inbound Delivery	EWM	Inbound
3	Outbound Delivery Request	EWM	Outbound
4	Outbound Delivery Order	EWM	Outbound
5	Outbound Delivery	EWM	Outbound
6	Posting Change Request	EWM	Posting Change
7	Posting Change	EWM	Posting Change
8	Warehouse Request Documents	EWM	All
9	Warehouse Task Documents	EWM	All
10	Warehouse Order	EWM	All
11	Wave	EWM	Outbound
12	Transportation unit	EWM	Yard Management
13	Vehicle	EWM	Transportation Management

Table 10.A EWM Documents

10.1 Inbound Process

Generally inbound process starts with purchase order and ends with goods receipt. Diagram 10.1A shows different documents used in both ERP and EWM systems in connection with the inbound process.

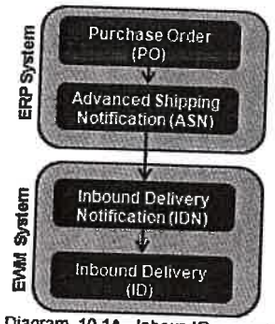


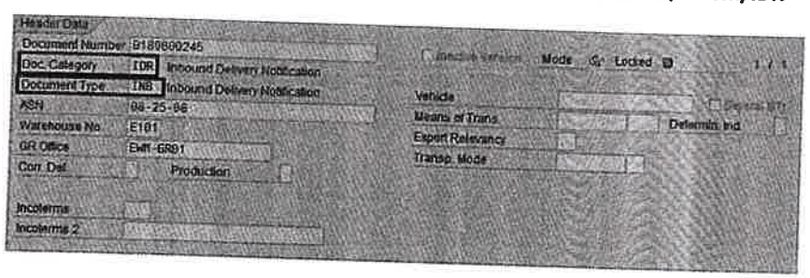
Diagram 10.1A – Inbound Documents

10.1.1 Inbound Delivery Notification (IDN)

In an EWM system, the IDN is a document created automatically with reference to the inbound delivery of the ERP system. The information from the advanced shipping notification from the supplier is stored in an inbound delivery document in ERP, which gets automatically transferred to the EWM system in the form of incoming messages and gets converted into an IDN document. The IDN number will remain same as the inbound delivery number of the ERP system. The IDN can be converted manually or automatically using PPF into inbound delivery. Using IDN, incoming changes to an existing inbound delivery can also be processed or rejected.

The standard document category used in IDN is IDR, and the document type is INB.

Menu Path: SAP Easy Access | Extended Warehouse Management | Delivery Processing | Inbound Delivery | Maintain Inbound Delivery Notification or TCode /SCWM/IDN



10.1.2 Inbound Delivery (ID)

In EWM, Inbound Delivery is a document, containing all the data required for triggering and monitoring the complete inbound delivery process. This is also called a warehouse request document. This

process starts with receipt of the goods in the delivery process or in the yard and ends with transfer of the goods at the final putaway. From the Inbound delivery, the WTs are created to control the putaway and other associated process such as unloading, packing, and staging.

An inbound delivery can be created automatically after activating the IDN, and it adopts all the relevant data from the IDN. In EWM, inbound delivery is referenced when executing the following actions:

- Registering the delivery in the yard
- Unloading the delivery
- Canceling the unloading of the delivery
- Placing the delivery into stock (putaway)
- Canceling the delivery putaway
- Adjusting the delivery quantity (in case of over delivery or under delivery).
- Posting a goods movement
- Canceling a goods movement

The standard document category used in inbound delivery is PDI, and the document type is INB.

Menu Path: SAP Easy Access | Extended Warehouse Management | Delivery Processing | Inbound Delivery | Maintain Inbound Delivery or TCode /SCWM/PRDI

10.2 Outbound Process

Diagram 10.2A provides an overview of different documents used in both ERP and EWM systems in connection with the outbound process. The process begins in the ERP system when the created outbound delivery document contains one or more items which are EWM relevant. In such cases the delivery document is replicated to the EWM system automatically via qRFC. In the EWM system, the document created for ERP outbound delivery is an outbound delivery request (ODR). It is a copy of the ERP outbound delivery document and identified with the same number as the ERP outbound delivery.

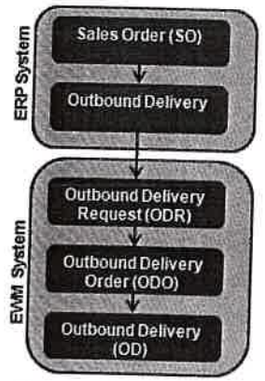


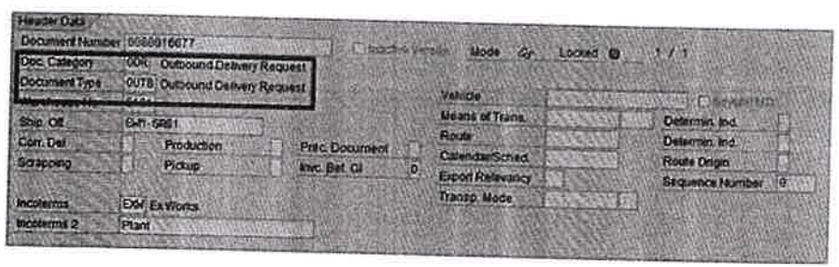
Diagram 10.2A – Outbound Documents

10.2.1 Outbound Delivery Request (ODR)

The ODR contains all the relevant logistics data in the outbound delivery process, taken directly from the ERP outbound delivery and sales order.

The ODR is created automatically by incoming messages and is converted manually or automatically into an ODO. This document can used to plan warehouse resources or calculate the estimated workload for the outbound process. In ODR, the standard document category used is ODR, and the document type is OUTB.

Menu Path: SAP Easy Access | Extended Warehouse Management | Delivery Processing | Outbound Delivery | Maintain Outbound Delivery Request or TCode /SCWM/ODR



10.2.2 Outbound Delivery Order (ODO)

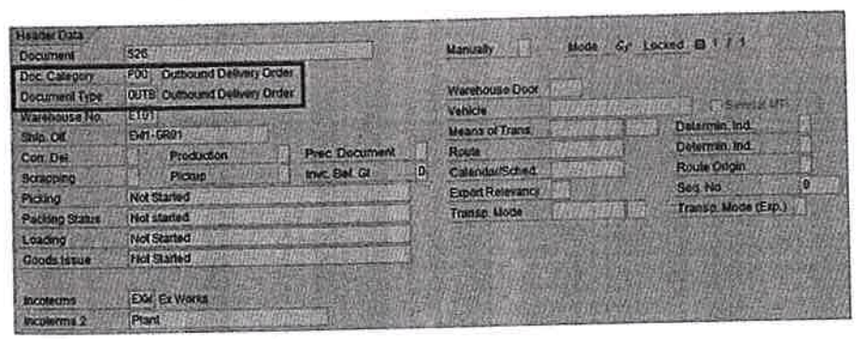
Based on PPF configuration settings, when the ODR is activated, the system creates the outbound delivery order (ODO) automatically. This is also called Warehouse Request document. The ODO contains all the data required for triggering and monitoring the complete outbound delivery process. The process starts with the first planning activities for the outbound delivery and continues until the finished goods have been loaded and sent.

The ODO is created automatically after activating the ODR. You can use ODO to preview the planning of pending warehouse activities or to execute the following actions:

- Picking the delivery
- Canceling the delivery picking
- Loading the delivery
- Canceling the delivery loading
- Setting the status "Leave Yard"
- Adjusting the delivery quantity to the picked quantity
- Posting a goods movement
- Canceling a goods movement

The standard document category used in ODO is PDO, and the document type is OUTB.

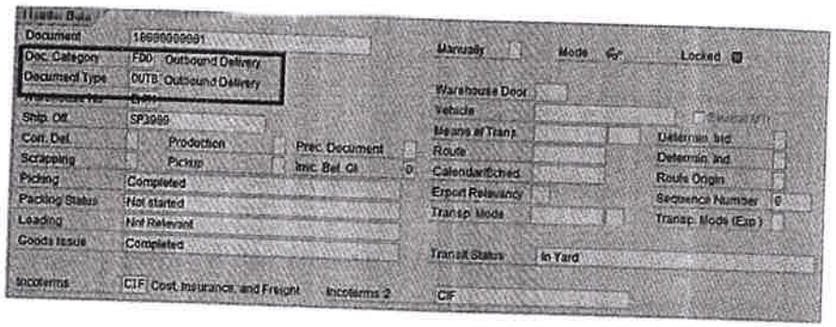
Menu Path: SAP Easy Access | Extended Warehouse Management | Delivery Processing | Outbound Delivery | Maintain Outbound Delivery Order or TCode /SCWM/PRDO



From the ODO, the WTs are created to control the picking and other associated processes such as packing, staging, and loading. Finally, when all the tasks are confirmed, the goods issue will be performed; this will create an outbound delivery in the EWM system, which is a proof of goods issue.

10.2.3 Outbound Delivery (OD)

Outbound delivery can be created manually by selecting action "Create Outbound Delivery" or automatically while posting goods issue, canceling goods issue, or setting the status "Leave Yard." The standard document category used in OD is FDO, and the document type is OUTB.



Menu Path: SAP Easy Access | Extended Warehouse Management | Delivery Processing | Outbound Delivery | Maintain Outbound Delivery or TCode /SCWM/FD

10.3 Posting Change Process

Diagram 10.3A provides an overview of posting change documents and process flow in both ERP and EWM. Posting changes can be initiated in the EWM system and communicated to the ERP, or they can be initiated in the ERP system and processed in the EWM system. In EWM, the term "posting change" is used to refer to a change in product, batch, stock type, or stock usage. This may or may not trigger the physical product movement in the warehouse. For example, if the stock type is changed from quality stock to unrestricted, it is not necessary that the stock also be physically moved out and placed back in the bin.

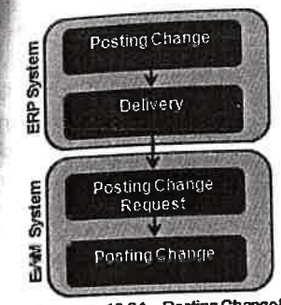


Diagram 10.3A – Posting Change Process

10.3.1 Posting Change Request

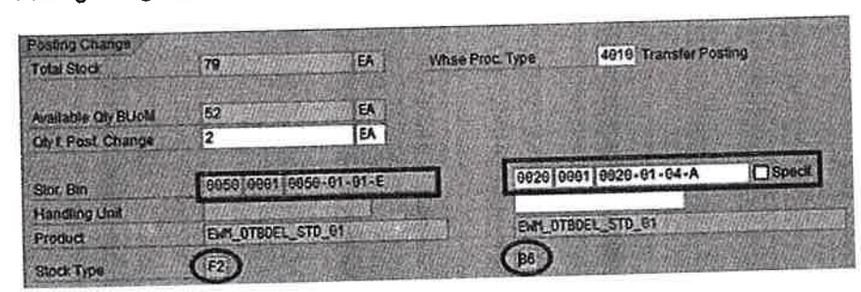
This is a document into which the system copies all relevant logistics data from the initiator of this process. For example, if it is initiated in ERP, it will copy all the data from posting change–related delivery. It is used to transfer the data to the posting change to create WTs.

Menu Path: SAP Easy Access | Extended Warehouse Management | Monitoring | Warehouse Management Monitor | Documents | Posting Changes or TCode /SCWM/MON

10.3.2 Posting Change

This is generated after activating a posting change request. From this document, WTs are created to initiate the posting change–related movements.

Menu Path: SAP Easy Access | Extended Warehouse Management | Work Scheduling | Make Posting Change for Product or TCode /SCWM/POST



10.4 Warehouse Request Document

This is a document used for planning and processing various warehouse activities for a specific product. "Warehouse request" is a generic term used in the warehouse to refer to outbound delivery orders in case of picking; inbound delivery in case of putaway; and posting change in case of stock transfer, scrapping, and product-to-product movement; and so on. One of the key pieces of information in the warehouse request documents is the WPT, which contains the configuration settings required to complete the process. The following types of warehouse requests can be created in the EWM system.

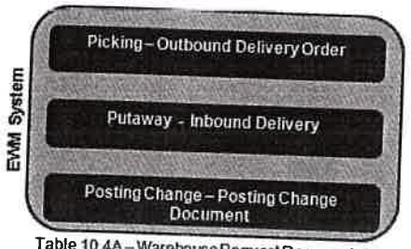


Table 10.4A – Warehouse Request Documents

When the system creates the warehouse request, the following activities are generally carried out in the background and updated in the warehouse request:

- Determination of WPT
- Determination of staging area
- Determination of door assignment
- Rough bin determination
- Wave assignment
- Creation of VAS order

In case of inbound delivery, the following additional activities are carried out, along with the above-mentioned activities:

- Automatic packing
- Determination of a counting for each delivery item
- Check of the handling unit type for notified handling units
- Creation of batches
- Creation of Inspection Document

In case of outbound deliveries, the following additional activities are carried out, along with the above-mentioned activities:

- Determination of which products can be packed together for a shipment

- Route determination

10.5 Warehouse Tasks

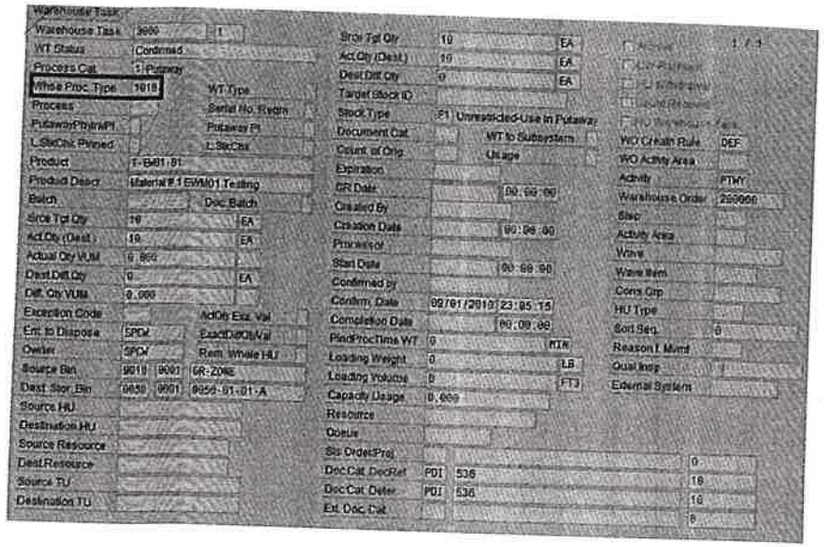
WTs are documents used in the EWM system for executing goods movements that are logical or physical, including pick, putaway, posting change, packing, internal warehouse movements, goods receipt postings, and goods issue postings. They are created either with reference to warehouse request document or created manually without reference. They contain all the necessary information on a planned goods movement, such as:

- What should be moved?
- Which quantity should be moved?
- From where products should be moved (source storage bin)
- To where products should be moved (destination storage bin)

The data in WTs are controlled by the WPTs. There are two types of warehouse tasks:

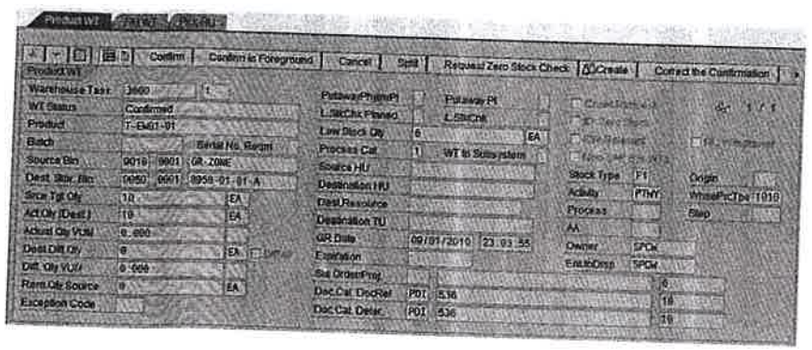
- **Product WT:** Product WTs contain all the required information to move products in and out of the warehouse, such as the product to be moved, the qty to be moved, source location, and the destination location.
- **HU WT:** A HU WT represents a goods movement of a HU. It contains all the required information to move the HU stock in and out of the warehouse like HU to be moved, source and destination location, and so on. HU tasks can also be used in loading and unloading warehouse activities.

Menu Path: SAP Easy Access | Extended Warehouse Management | Execution | Warehouse Management Monitor | Documents | Warehouse Task or TCode /SCWM/MON



10.6 Warehouse Orders (WO)

This is a warehouse document that represents an executable work package that a warehouse employee should perform at a specific time. It consists of WTs or PI items. WTs are assigned to a WO, based on a WOCR. WOCRs are defined as part of configuration and assigned to activity areas. The source or destination information from the WTs are used to determine the activity areas to be used to obtain WOCR to be applied to the WT.

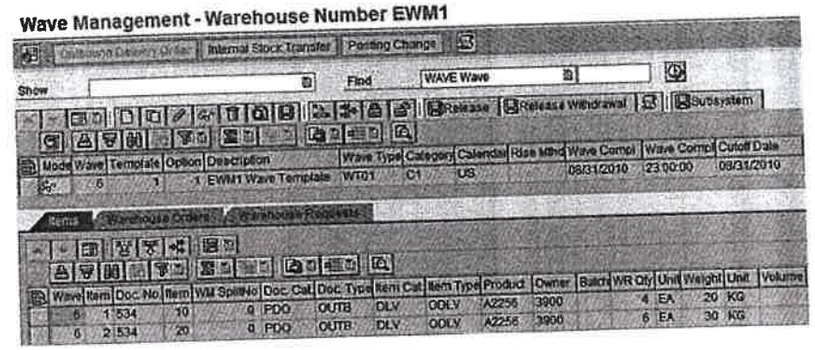


10.7 Wave

In EWM, wave documents can be used to group delivery items and to process them together at the same time to optimize the picking process and facilitate monitoring. They can be created automatically or manually via a batch program. For the automatic wave creation process, wave templates will be used. The parameters like capacity, lock time, planned pick and release time from the template will influence the creation of waves.

Wave templates can be created in transaction code /SCWM/WAVETMP. To determine the appropriate wave template condition, records have to be maintained in TCode /SCWM/WDGCM. To create waves manually, the TCode is /SCWM/WAVE. All these transaction codes are available under the SAP easy access menu.

Menu Path: SAP Easy Access | Extended Warehouse Management | Work Scheduling | Wave Management



10.8 Transportation Unit (TU)

This is the smallest loadable unit of a vehicle used to transport goods. Examples for TU include a semitrailer truck with one compartment, a truck with a cargo area and trailer (two TUs), or a train with multiple wagons (multiple TUs). TUs and vehicles are used in yard management. The details will be covered in the "Advanced Concepts in SCM-EWM (A Step by Step Guide)" book.

TUs can be created in three different ways.

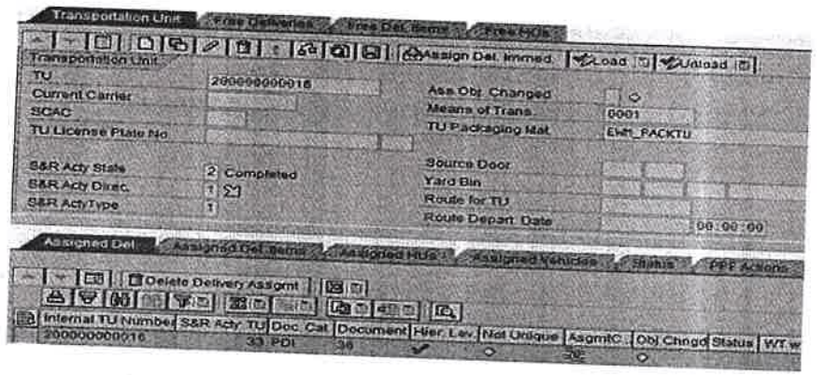
i. Create them from the TU user interface (UI)

ii. Create them from the check-in/check-out transaction

iii. Create them automatically during the interface with advance shipping notification from ERP

TUs are important master data about the conveyances used to transport the products to and from the warehouse. In EWM, TUs represent HUs. In the TU master data user can enter TU ID number, carrier, SCAC, means of transport, packaging material, route, direction (i.e., shipping or receiving), and the start and end date time.

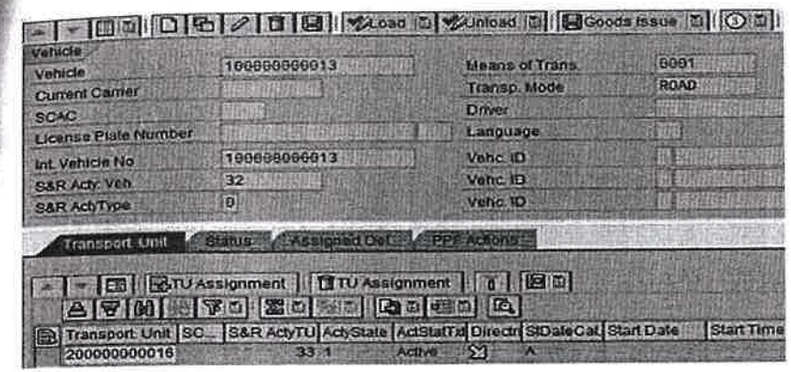
If daily creation of a new TU is not mandatory, (if the same carrier ships the data) the existing TUs can be reused. This helps eliminate unnecessary data entry and data maintenance in day-to-day warehouse operations.



10.9 Vehicle

A vehicle is the equipment used to transport TUs. This can comprise one or more TUs. Examples of vehicles include trucks, locomotive engines, ships, and so on.

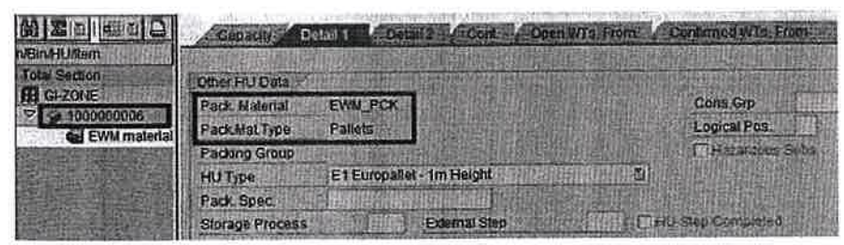
In EWM, vehicles can be created either in vehicle UI or check-in/out transactions.

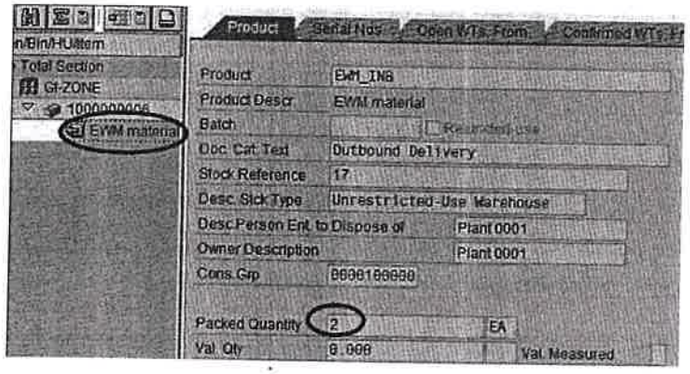


10.10 Handling Units (HUs)

A HU is a physical unit consisting of packaging materials and the goods contained on/in it. It is always a combination of products and packaging materials. All the information contained in the product items (for example, information about batches, quantity, stock type, etc.) is retained in the handling units. Therefore, when the HU is moved from one location to another, the entire content of the HU moves along with it.

For unique identification, every HU has a unique, scannable identification number that can either be generated by the system or be specified externally. In EWM, HUs are mandatory for some of warehouse processes, such as process-oriented putaways, layout-oriented putaways, value added services, and so on.





Summary

This chapter described different warehouse documents used in EWM. This should provide a basic understanding of what these documents are. The coming chapters will further explain these documents, along with examples.

Chapter 11: Warehouse Process Type (WPT)

WPT plays an important role in warehouse movements. Similar to warehouse movement types in ERP WM, WPT controls the movement of products in the EWM system. In EWM, WPT is required to control every warehouse process, such as goods receipt, goods issue, repacking, and so on. Thus, it becomes crucial to understand how to configure WPT and how it is determined in the warehouse request documents. This chapter will explain how to define WPT, the meaning of different indicators in WPT and how it is determined in the warehouse request document.

11.1 Define Warehouse Process Type (WPT)

In EWM, WPT is assigned to a warehouse process category and warehouse activity together, which shows the direction of the goods movement in the warehouse. As with ERP WM movement type, source and/or destination storage type and bin information can be included in the WPT definition. One important difference between ERP WM movement type and EWM WPT is that in EWM, dynamic storage bins cannot be used for the interim storage types.

WPT settings are broadly divided into six sections. They include the following:

i. General settings

ii. Control for putaway and stock removal

iii. Control indicators for HUs

iv. Settings for storage process

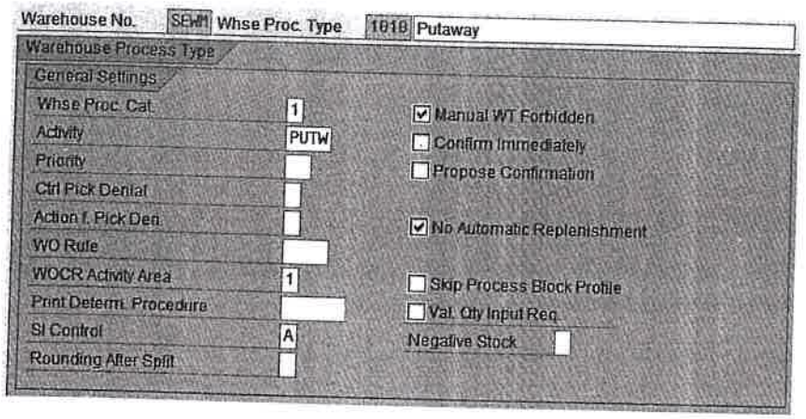
v. Posting change settings

vi. Settings for warehouse requests

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Warehouse Process Type

11.1.1 General WPT Settings

General WPT settings consist of several indicators that facilitate the movement of products in the warehouse.



- **Whse Proc. Cat**: The warehouse process category is used to classify the type of goods movements such as putaway, stock removal, internal warehouse movement, PI, goods receipt posting, goods issue posting, posting change, and cross-line stock putaways. All these process categories are predefined by SAP, and most of them are available for selection during the WPT definition, except for goods receipts and issue. For technical reasons, goods receipts and issue categories are not available for selection and are used by SAP internally to identify the relevant process.

- **Activity**: In EWM, activities trigger goods movements. Warehouse activity together with warehouse process category show the direction of the movement in the warehouse. This is used to select the appropriate activity for the WPT.

- **Ctrl Pick Denial**: This is used to specify how pick denial should be processed on both dialog and background modes. It can be "Warning for dialog, automatic follow-up action in background" or "Automatic follow-up action in dialog and in background."

- **Action for Pick Denial**: This defines the action to be performed in case of pick denial. Options include "No action," "qty to be adjusted in warehouse request," or "adjust the qty to pick qty and send a message."

- **Stock Identification Control (SI Control)**: This is a unique number that you use to identify non-HU stock with all its stock attributes, such as quantity, batch, or stock type. When the goods movements are performed in the warehouse, for every goods movement, the system creates a new WT with a unique WT number. If the values chosen in the WPT "B—Create Stock Identification if none exists," the system automatically creates the stock identification in every product WT, which can be bar-coded and used to confirm the warehouse task. For technical reasons, it is necessary to

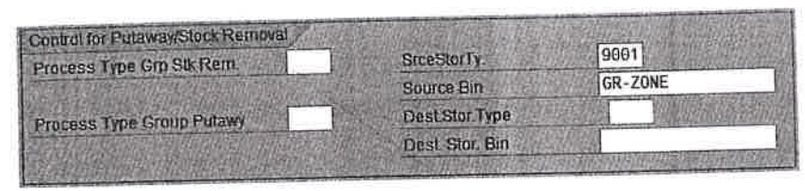
delete the SI in the final destination putaway storage type. If the SI is not deleted, the putaway status will not be updated as completed.

- **Skip Process Block Profile**: A process block profile can be used to trigger an error or warning message when certain processes are performed in the warehouse for a product. For example, a warning message may be displayed when the product is goods issued. A process block profile is assigned to the product master. If this indicator is set in the WPT, the system does not take into account the process block profile assigned in the product master.

- **Negative Stock**: This is used to specify whether or not negative stock should be allowed. If the indicator is set to "A," the system will allow the posting of negative quants for movements with this WPT.

11.1.2 Control for Putaway and Stock Removal

This defines process type groups for putaway and picking along with source and destination bin information.



- **Process Type Group for Stock Removal and Putaway**: You can assign a WPT group for stock removal and putaway to summarize the WPTs for putaway and removal strategies.

- **Source & Destination Stor. Type/Bin**: Storage Type and Storage Bin defined here are used as a default source or destination bin during putaway/picking with this WPT.

11.1.3 HU Control

These control indicators are used only for HU-managed stock.

- **Round Whole Units**: This is used for rounding the WT quantity to whole units. The available options are as follows:

  i. Round down to a single unit

ii. Round down to a multiple of a unit

iii. Round up to a multiple of a unit

- **Control for HU Pick**: This indicator guides the system in determining what should be the pick HU; that is, while picking, whether the source HU should be used as pick HU or product and source HU should be adopted into pick HU.

11.1.4 Settings for Storage Process

Indicators defined here are used during the process oriented putaway.

- **Storage Process**: Activities and storage process steps can be summarized into a storage process. The storage process describes the activities that must be performed and their sequence. For example, in the goods receipt process, the internal storage process steps allowed could be in the sequence of unload, count, deconsolidate, and putaway. The storage process steps can be defined in the menu "Define Process-Oriented Storage Control."

- **Deactivation Allowed**: If this check box is activated, manual changes to storage control are allowed. This means that if a user wants to create a WT directly for a destination storage bin, without the product or HU passing through interim steps, then the parameter "Storage Control Is Not Relevant" can be set in the transaction at the time of creating the WTs. Changing this indicator is possible only if this check is on.

11.1.4 Settings for Posting Changes

Indicators defined here are used during the posting change.

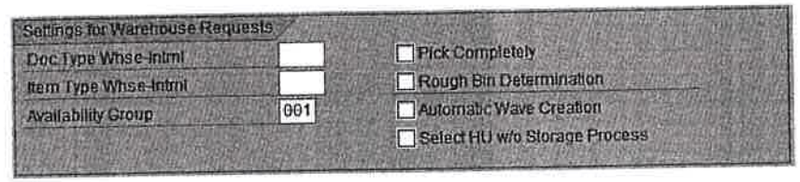
- **Posting Change in Bin:** This decides whether the posting change should transfer the stock to different bin with creation of WT or it should direct transfer in the same Bin.

- **Exception Code for Posting Change**: An exception code can be entered here to trigger the subsequent action after posting change.

- **Goods Movement before Warehouse Task:** In EWM, goods movement for posting change can happen in three ways: goods movement before creating and confirming WTs, after the creating and confirming the WT, or without creating of a WT. If this check box is checked, the goods movement will occur before creation and confirmation of WTs.

11.1.5 Settings for Warehouse Request

Indicators defined here are used in the warehouse request.



- **Doc. and Item Type Whse Intrnl**: If a warehouse request is created as a follow-up action to an internal warehouse process, it is necessary to specify a document and item type for this warehouse request. One default document type can be defined for each process type.

- **Pick Completely**: Activate this indicator if the entire requested quantity in the warehouse request should be picked and a minimum coverage of the quantity to pick is not allowed.

- **Rough Bin Determination**: Performs a rough bin determination for warehouse request item. Rough bin determination is used for wave picks and planning the replenishment of orders.

- **Automatic Wave Creation:** if this is set, warehouse request items with this WPT are transferred for auto wave pick assignment.

- **Availability Group**: When the system defines the stock type of a delivery, it uses the availability group of the WPT and not the availability group of the storage type. If this WPT is delivery relevant, an appropriate availability group must be assigned to this WPT.

- **Select HU without Storage Process**: Set this indicator if a HU is to be put away (placed in storage) without a storage process. A HU WT is created for this purpose. If this indicator has not been set, the product items of a HU are put away without a storage process via product WTs.

11.2 Define Control Indicators for Determining WPT

This IMG activity defines the product-specific control indicator for determining the WPT. This indicator can be used to group products for which the same WPT will always be used. The control indicator can be assigned to the relevant products in the warehouse data view of the product master.

If this indicator is maintained in the product master, whenever the warehouse request is created, EWM takes the product master attribute to determine the WPT.

Menu path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Control Indicators for Determining Warehouse Process Types

Control Indicator for Warehouse Process Type Determination

War	ProTyp	Description
SEWM	01	Storage Process Active
SEWM	02	VAS Storage Process Active
SEWM	03	In-house Produced Materials
SEWM	04	Direct Putaway without Storage Process

11.3 Determine Warehouse Process Type

While creating a warehouse request, the system uses warehouse number, document type, item type, delivery priority, control indicator, and process type determination indicators to determine the WPT. Diagram 11.3A shows how the information flows to determine the WPT.

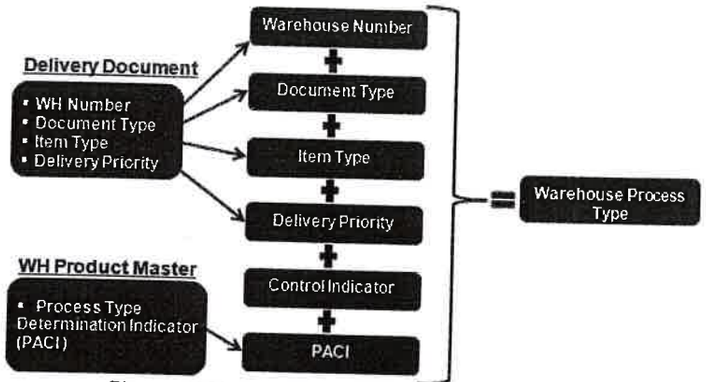


Diagram 11.3A – Determination of WPT

If the warehouse request is with reference to the delivery documents (inbound or outbound deliveries), the warehouse number, document type, item type, and delivery priority information flows from delivery documents, and the process type determination indicator is derived from the warehouse product master.

The system determines the WPT according to the following logic, which means that it is not always necessary to make entries in all the fields. The table values are read in the following sequence:

- All key fields are specified
- Document type, item type, and processing priority are specified
- Document type, item type, and control indicator are specified
- Document type and item type are specified
- Item type, processing priority, and control indicator are specified
- Item type and processing priority are specified
- Item type and control indicator are specified
- Item type is specified
- Document type, processing priority, and control indicator are specified
- Document type and processing priority are specified
- Document type and control indicator are specified
- Only the document type is specified

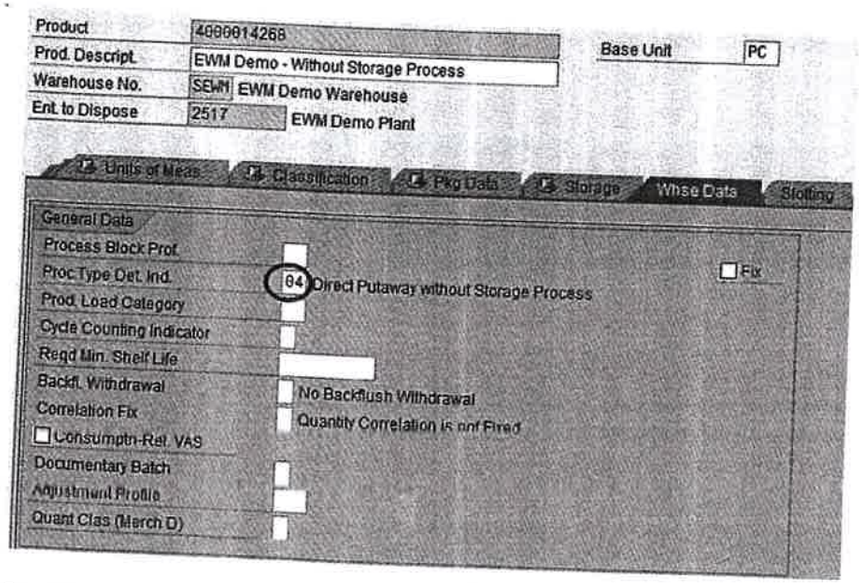
Menu path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Determine Warehouse Process Type

Determination of Warehouse Process Type

War	Doc. Type	Item Type	Del Prio.	ProTypeDet	Process Ind.	WhsePrcT
SEWM	INB			04	No Speci	1010

11.4 Assign Control Indicator to the Products Master

One of the keys used in determining the WPT is the control indicator from the product master. You can assign the control indicator to the relevant products in the warehouse data view of the product master in TCode /SCWM/MAT1.



Summary

This chapter has explained what a WPT is and its importance in the warehouse. Chapters 14, 15, 16, 19, and 20 will show how the WPT is determined in the warehouse request document, along with examples.

Chapter 12: Warehouse Order

A Warehouse Order (WO) is a document that represents an executable work package for a warehouse employee to perform at a specific time. This chapter will discuss how WTs are processed and grouped into warehouse orders, the role of the warehouse order creation rules (WOCR), and how they can be configured to meet the client's requirements.

12.1 Overview of WO Creation Process

WOs consist of WTs or PI items. At the time of the WO creation process, all WTs pass through a function called WOCR, which determines the number of WTs for a given WO. During this process, as shown in diagram 12.1A, WOCR might bundle more than one WT into one WO or can create multiple WOs for one WT, depending on rules defined in the WOCR.

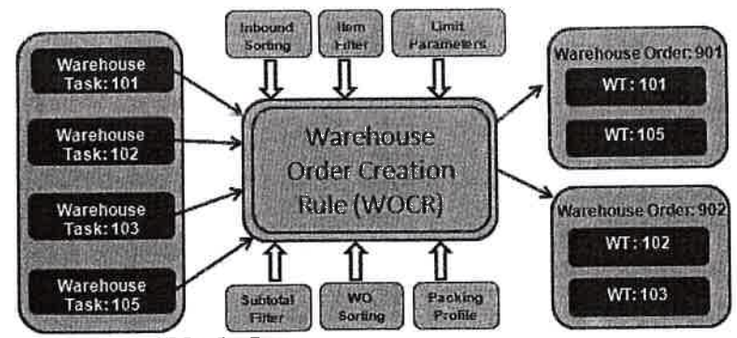


Diagram 12.1A – WO Creation Process

WOCR is a set of rules defined as part of a configuration and assigned to the activity areas. Multiple WOCRs can be assigned to each activity area. Based on the activity area and activity code from the WPT, the system determines the appropriate WOCR. Once the WOCR is determined, the system uses WOCR to decide how and which WTs should be grouped together and how many WOs should be created for the WTs. Once the WOs are created, they are available for processing in the warehouse. In a RF environment, the WO acts like a RF queue. Resources can be assigned manually or automatically to the WO, using resource management to execute the WO.

Diagram 12.1B provides an overview of how the WOCRs get determined and how the WOs are created. In this diagram, outbound delivery has been used as an example.

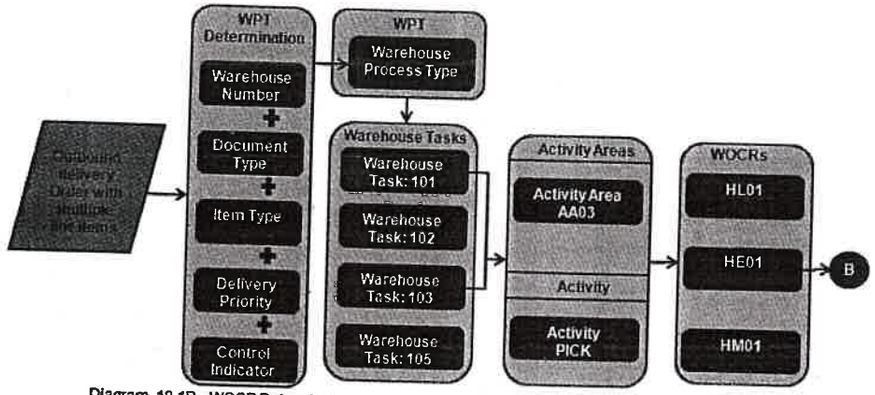


Diagram 12.1B – WOCR Determination

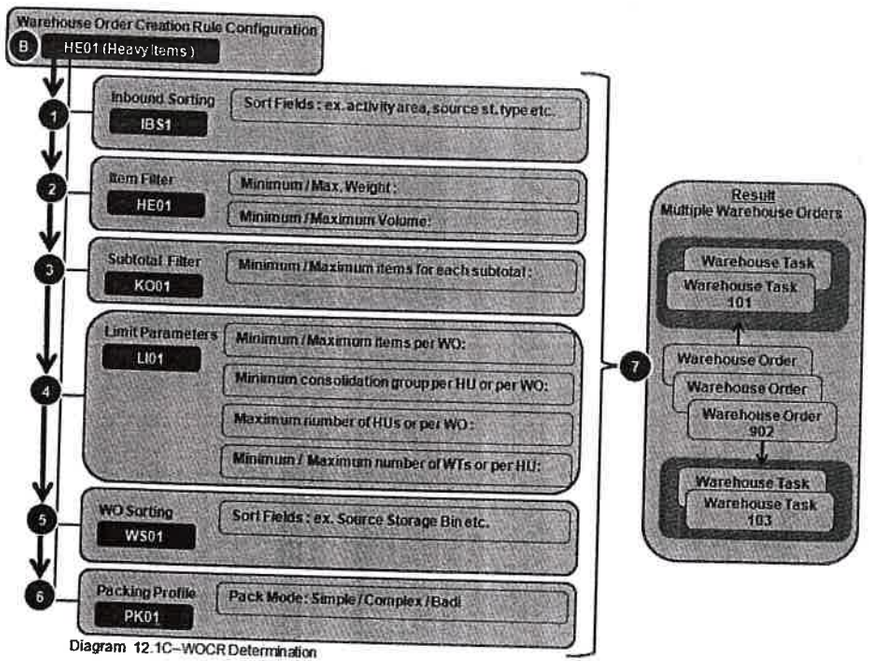


Diagram 12.1C–WOCR Determination

As explained in the above diagram, when the warehouse request (WR) is created, the WPT gets determined. WPT helps to create the WTs. When creating the WTs, EWM first searches for the stock and creates one or more WTs. These WTs will then go through the WO creation process.

In the WO creation process, all WTs will be grouped by activity area. Activity areas are determined as per the WPT configuration setting (i.e., WOCR Activity Area, source or destination bin, along with the activity code). Based on the activity areas, the system determines the WOCRs for the activity areas. Each activity area can have more than one WOCR. EWM system will first pass all the WTs to the first WOCR. If any tasks fail, the system stops processing the WT and continues with the next task in sequence.

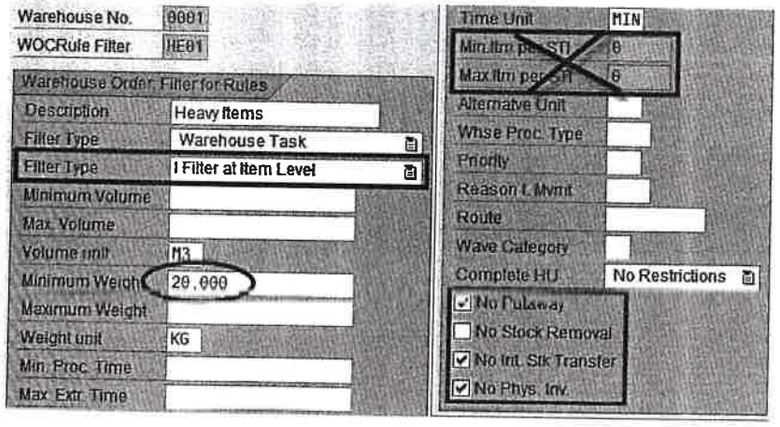
12.1.1 Inbound Sorting

As soon as system applies a WOCR, WTs will be sorted as per the sort rules defined for the WOCR. These items will then move through the item filter rules defined for the WOCR.

The sort rules and fields can be defined by following **menu path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Order | Define Sort Rules for Warehouse Tasks**

12.1.2 Item Filter

An item filter checks an individual WT for the defined filter criteria. This is used to filter out all tasks that do not meet the filter criteria mentioned for the WOCR. For example, it may be set to filter out all heavy items whose weight is more than 20,000 kg. If the filter fits the WT, the system continues processing the WT. If it does not fit, the system stops processing the WT and continues with the next task in sequence.

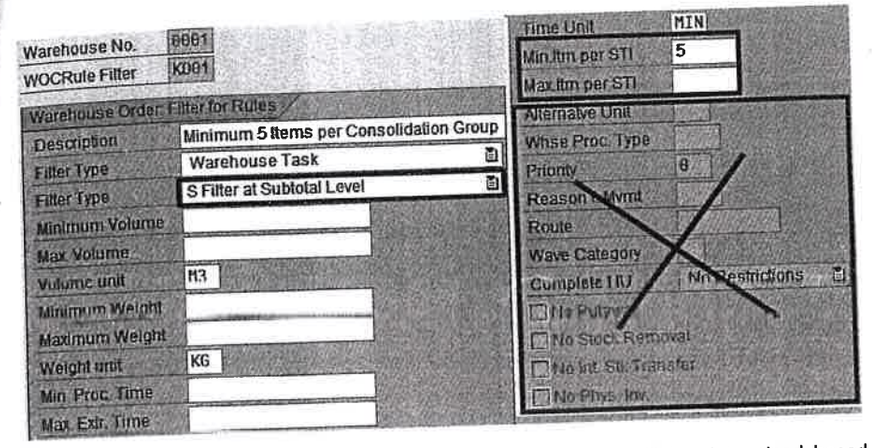


In the item filter we can specify minimum/maximum values for volume, weight, and processing, and extract time for each item filter, priority, route, wave category, and HU withdrawals restrictions. If this filter should not be applied for putaway, picking, internal stock transfer, or PI, check the respective check boxes in the item filter configuration screen.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Order | Define Filters for Warehouse Order Creation Rules

12.1.3 Subtotal Filter

This can be used to specify minimum/maximum values for volume, weight, and number of item per subtotal, along with minimum processing time and maximum extract time. An example might be a minimum of five items per subtotal. In addition, we can also specify minimum processing time and maximum extract time for each subtotal filter.



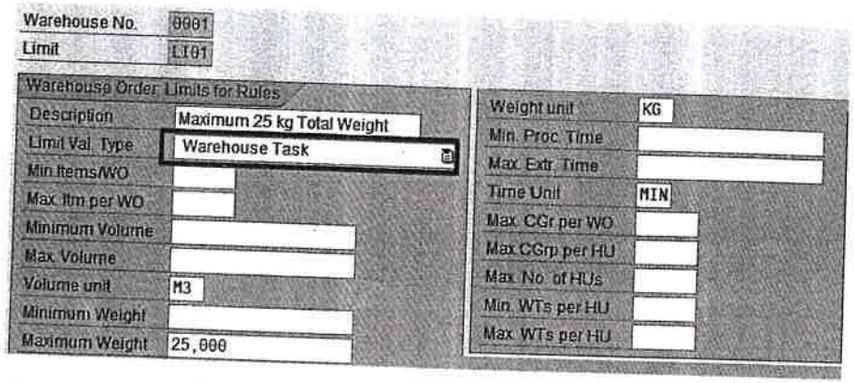
The subtotal filter is based on the consolidation group (CG). It will be determined based on the customizing settings of the activity area. CG helps to determine which items can be packed and shipped together. The subtotal filter can be used to specify minimum and/or maximum number of items per subtotal.

If the filter fits the WT, the system continues processing it. If it does not fit, the system stops processing the WT and continues with the next task in sequence.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Order | Define Filters for Warehouse Order Creation Rules

12.1.4 Limit Parameters

This defines the size and/or scope of the warehouse order. This means that, using this profile, the number of WTs assigned to a WO can be restricted. The parameters defined here are maximum/minimum values for number of items per WO, weight, volume, minimum processing time, maximum extract time, maximum number of consolidation groups per WO/per HU, and minimum/maximum WTs per HU. As soon as the value exceeds the defined maximum limit, the system will create a WO for all the WTs processed to that point. This process will continue for the remaining WTs.



After the WO creation has checked the values for the maximum limits, it checks the values for the minimum limits. If the filter fits the WT, the system continues processing it. If it does not fit, it stops processing the WT and continues with the next task in sequence.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Order | Define Limit Values for the Size of a Warehouse Order

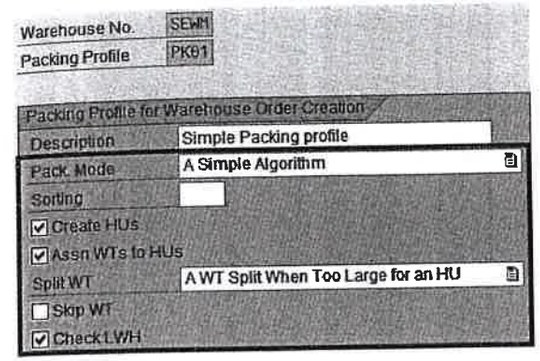
12.1.5 WO Sorting

In this step, the system will sort the WTs, as per the WO sorted rule before creating the WO. Sorting rules for WO sorting are defined under the same menu as inbound sorting.

12.1.6 Packing Profile

This defines packing profiles for WO creation. This helps to control how WO creation determines pick-handling units for a WO. The system uses the data from the WTs of a WO (such as weight, volume, or dimensions) to perform this determination. It compares this data with possible packaging materials and determines the number and category of the required pick-handling units. In addition to these values, when determining the pick-handling units, the system also considers limit values for the size of a WO. Limit values considered are maximum number of different deconsolidation groups in a pick-handling unit, maximum number of pick-handling units, maximum number of items for each handling unit, or minimum number of items for each handling unit.

When defining packing profile, select appropriate modes for determining the pick-handling units. Available modes are simple algorithm, complex algorithm, or BADI. A simple algorithm can have one packaging material.



12.1.7 Result

At the end of step 6, the system will create the required amount of WOs for the completely processed WTs. There can be one or several WOs. Each WO might contain one or more WTs.

All skipped WTs will then get processed with the next available WOCR and will follow all seven steps explained above.

12.1.8 Exceptions

If the system has applied all the WOCR defined for the activity area, and there are still unprocessed WTs, the system uses a SAP-defined WOCR called the *remainder rule* (UNDE). This rule creates WOs for the remaining WTs. Under this rule, the system summarizes the WTs, according to the following criteria:

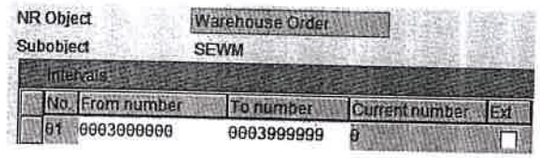
- For each activity area
- For each queue
- For each consolidation group

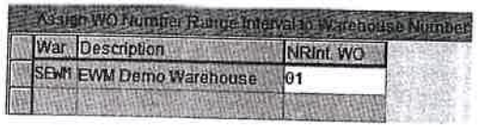
If there are no defined WO creation rules for the current activity area, the system uses a standard WOCR called DEF (default rule). This rule attempts to group deliveries according to the following criteria:

- For each activity area
- For each queue
- For each delivery

12.2 Define Number Ranges for Warehouse Order

This configuration helps to generate the unique number for each WO. This menu defines an internal number range for WOs and assigns it to the warehouse number.



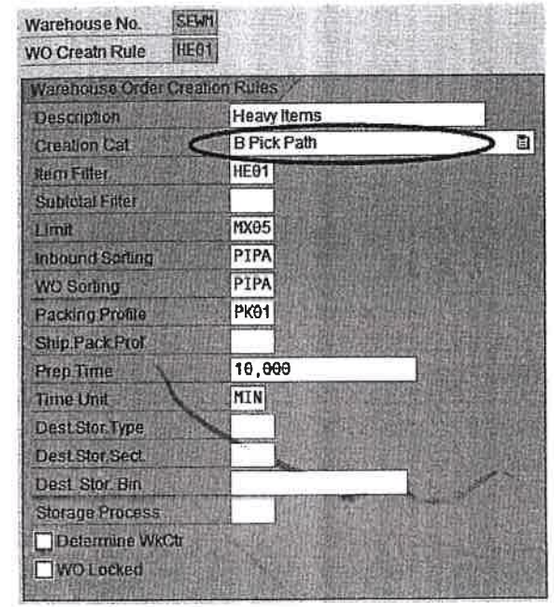


Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Order | Define Number Ranges for Warehouse Order

12.3 Define Warehouse Order Creation Rule (WOCR)

In the overview of WO creation process section we have discussed how to configure the required filter profiles for the WOCR. After the WOCR profiles have been created, they need to be assigned to the WOCRs.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Order | Define Creation Rule for Warehouse Orders



Creation Category: WOCR categories are different ways in which WO creation occurs. The available options are:

- Consolidation Group: System keeps together WTs that belong to the same consolidation group
- Pick Path: System optimizes the picking process along the pick path
- Pick, Pack, and Pass (system-driven): System predefines the sequence of WOs created for different activity areas, according to customizing settings
- Pick, Pack, and Pass (user-driven): User can select the sequence of WOs
- Load and Unload: Used to load and unload transportation units.
- Distributive Putaway: Used to put away a HU with several products, according to the pick path
- Physical Inventory: Used to create WOs for PI items

The destination storage type, section, bin, and determine work center fields are not available for Pick, Pack, and Pass (system-driven), Pick, Pack, and Pass (user-driven), Pick and Pack, Load and Unload, Distributive Putaway, or PI. Additional fields not applicable for the physical inventory option include subtotal filter, packing profile, and shipment packing profile.

12.4 Define WOCR Search Sequence for Activity Areas

This menu assigns one or more WOCRs to an activity area. These rules are processed during WO creation for each activity area, according to the sequence defined.

Warehouse Order Search Sequence for Rules per Activity Area

War	AA	Activity	Sequ	WOCR	Description
SEWM	PICK		1	HE01	Heavy Items
SEWM	PICK		2	KO01	Minimum 5 Items per Consolidation Group
SEWM	PICK		3	LI01	Light Items to Max. 25 kg Total Weight
SEWM	PICK		4	HU01	Complete Pallet Withdrawal
SEWM	PICK		5	PU01	Putaway

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Order | Define Search Sequence of Creation Rules for Activity Areas

WOCR can also be assigned to WPT when defining the WPT. The system uses this WOCR for creation of WO for all the tasks that have this WPT.

Summary

This chapter has explained what a WO creation rule is and its importance in processing WTs. It has also demonstrated how to define and assign multiple WOCRs to activity areas.

Chapter 13: Delivery Processing in EWM

The delivery document plays a key role in the EWM system. It is the trigger for the majority of warehouse movements and serves as the key document in the integration between ERP and EWM. This chapter will describe various delivery processing profiles, the basic configuration settings related to delivery document integration, data mapping between the ERP and EWM documents/item types, and EWM delivery document determination.

13.1 Overview of Delivery Document Integration

From an integration point, it is important to understand the basic EWM integration setting for delivery documents. Delivery documents are very important for data exchange between the ERP and EWM systems. Diagram 13.1A provides an overview of delivery document process flow and integration between ERP and EWM systems. Most of the communication between ERP and EWM systems is two-way, and the qRFC technology is used to communicate the data.

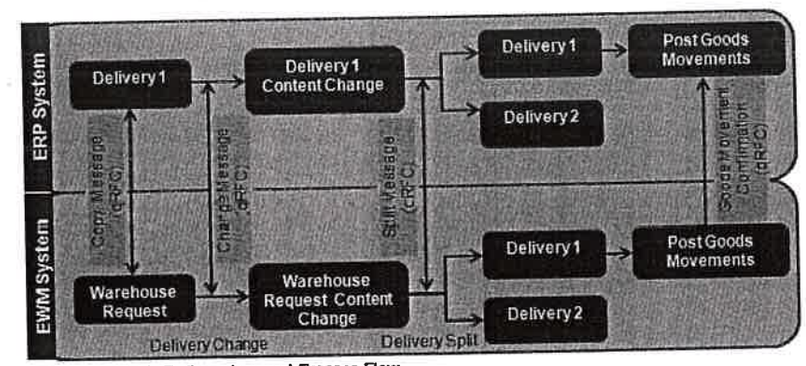


Diagram 13.1A–Delivery document Process Flow

Even though, in most cases, the creation of delivery documents is initiated in the ERP system, it is possible that in certain cases, the EWM system initiates the creation of delivery documents. For example, manual inbound delivery can be created in the EWM system. In such cases, the content of the delivery document must be transferred to the ERP system using qRFC. The other possible reasons for the data exchange between the two systems are changes in the delivery document, delivery split, PCN, or the goods movement confirmation in the EWM system. In order to transfer data between the ERP and EWM systems, both systems need to be configured, and the delivery document integration must exist in the EWM system.

Diagram 13.1B shows how the inbound delivery created in the ERP system gets processed in the EWM system, and the following documents are created and communicated between two systems.

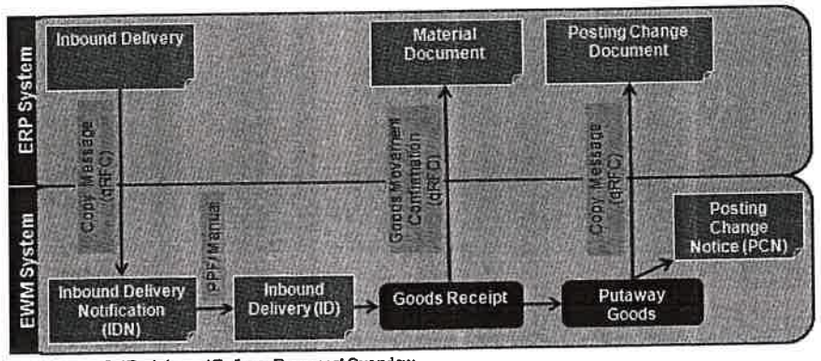


Diagram 13.1B – Inbound Delivery Document Overview

13.1.1 Delivery Document Structure

Every delivery document contains a document header and one or more document items. Document header data is valid for the entire document, and item-specific information is stored in the document items.

13.1.1.1 Delivery Document Header

The document header contains the general data information that is relevant for the entire document. Two key parameters in the header data include document category and document type.

Document Category: The document category classifies the different type of documents that can be processed by the system in delivery processing. Examples include expected goods receipt, inbound or outbound delivery, posting change, stock transfers. These are predefined in the EWM system and cannot be changed.

Table 13.1.1.1A contains some of the most frequently used document categories in the EWM system.

Document Category	Description
EGR	Expected Goods Receipt
GRN	Goods Receipt Notification
IDR	Inbound Delivery Notification
PDI	Inbound Delivery
FDO	Outbound Delivery
ODR	Outbound Delivery Request
PDO	Outbound Delivery Order
POR	Posting Change Request
SPC	Posting Change
WMR	Stock Transfer

Table 13.1.1.1A - Document Categories

Document Type: The document type classifies the document with regard to the complete delivery process. It defines the primary business use of the document. Custom document types can be created in the EWM system. Table 13.1.1.1B contains some of the most frequently used document types in the EWM system.

Document Type	Description
INB	Inbound Delivery
INBI	Inbound Delivery Production
OUTB	Outbound Delivery
SREA	Warehouse Reorganization
SRPL	Replenishment
SWHI	Stock Transfer
TWPR	Posting Change

Table 13.1.1.1B - Document Types

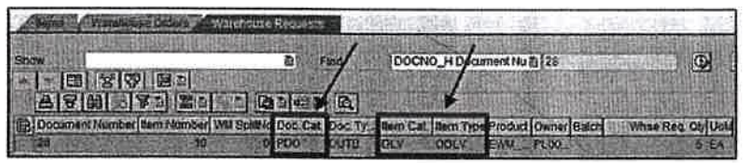
Mapping of Document Category and Document Type: Every document (goods receipt, goods issue, stock transfers, posting change, etc.) in EWM has a document type and document category. It is possible for each document type may have one or more document category, or every document category might have more than one document type. Table 13.1.1.1C shows some of the important document types and their respective document category codes.

Document Type	Document Category	Description
OUTB	PDO	Outbound Delivery
OUTB	PDO	Outbound Delivery Order
OUTB	ODR	Outbound Delivery Request
INB	IDR	Inbound Delivery Notification
INB	PDI	Inbound Delivery
SPRL	WMR	Replenishment
SWHI	WMR	Stock Transfer
TWPR	POR	Posting Change Request
TWPR	SPC	Posting Change

Table 13.1.1.1C - Mapping of Document Type and Document Category

13.1.1.2 Delivery Document Item

Delivery document items contain information related to products, such as product number, delivery quantity, picking quantity, weight and volume details, and so on. Every item is uniquely identified by item number. Like the document header, the document item also contains document category, item category, and item type.



Delivery document items can be broadly classified as delivery item, packing item, return item, text item, or value item. System uses the item category for this classification. Item categories are defined by SAP and cannot be changed. Table 13.1.1.2A shows a list of item categories widely used in the EWM system.

Item Category	Description
DLV	Delivery Item
PAC	Packing Item
RET	Return Item
TXT	Text Item
VAL	Value Item

Table 13.1.1.2A - Item Categories

The delivery item type defines the business characteristics or type of delivery item like inbound delivery item, outbound delivery item, or posting change item, and so on. Table 13.1.1.2B shows a list of item

types commonly used in the EWM system. You can configure your own item types to represent your business needs.

Item Type	Description
IDLV	Inbound Delivery Item
ODLV	Outbound Delivery Item
TWPR	Posting Change Item

Table 13.1.1.2B - Item Types

SAP has provided a set of standard settings for the common delivery documents. For custom delivery types, some of these settings may have to be defined manually.

13.2 Delivery Processing Profiles

One of the important configuration objects of the delivery processing are the various delivery processing profiles, which influence the processing of goods receipt, goods issue, and internal warehouse process. These profiles are used to define how the document types and item types are processed within EWM. These profiles are broadly categorized as follows:

System Profiles: System profiles are standard profiles delivered by SAP. They cannot be configured or changed. They are used internally by the system as default options during the delivery processing, if the customer specific profiles are missing. Internally, these profiles are linked to document categories and item categories.

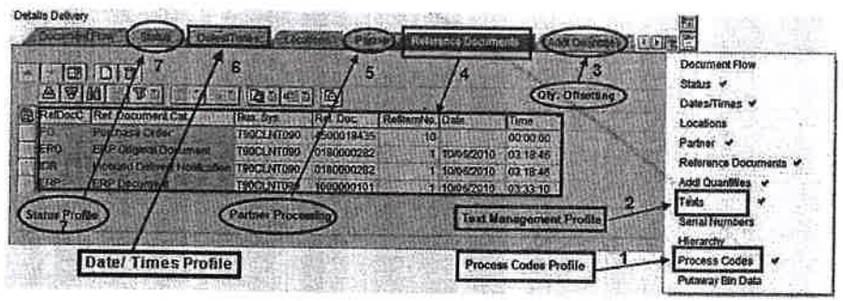
Customer Profiles: SAP has provided this option for users to define their own profiles to meet their business needs. SAP has also delivered various customer profiles. This section will discuss customer profiles and how they are linked to the item types and document types.

Table 13.2A provides an overview of various delivery processing profiles used in EWM. The following section will cover how they are configured and their usage in the delivery documents.

S. No	Delivery Processing Profiles	TCode	System	Transportable
1	Delivery Qty Adjustment	SPRO	EWM	Yes
2	Text Management	SPRO	EWM	Yes
3	Quantity Offsetting	SPRO	EWM	Yes
4	Reference Documents	SPRO	EWM	Yes
5	Partner Processing	SPRO	EWM	Yes
6	Dates / Times Profile	SPRO	EWM	Yes
7	Status Management	SPRO	EWM	Yes
8	Field Control	SPRO	EWM	Yes
9	Incompleteness Check	SPRO	EWM	Yes
10	Process Management & Control	SPRO	EWM	Yes

Table 13.2A Delivery Processing Profiles

In the following screenshot, the various delivery processing profiles used in the inbound delivery document can be seen. Each profile is defined for a specific purpose. For example, a reference documents profile is defined to keep track of the reference documents created against the original document. These profiles are explained below.



13.2.1 Process Codes (Delivery Quantity Adjustment) Profile

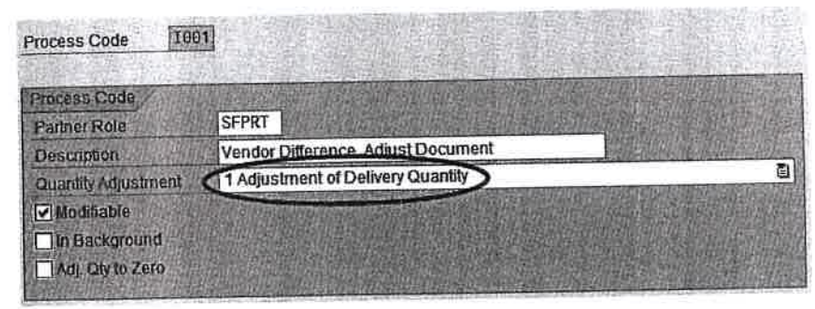
Process code profile is also called as delivery quantity adjustment profile. In the warehouse, for various reasons, it is required to alter the delivery quantity in the system—for example, if the delivery document quantity is different than the actual delivered quantity. In this case, it is required to update the delivery document quantity to the delivered quantity and create a new delivery document for the open quantity. In such scenarios, process codes are used to update the delivery quantity and trigger the required follow-up action.

13.2.1.1 Process Codes

Process code controls the way delivery quantity is adjusted. Here the available options include the following:

- **No Quantity Adjustment:** In this case, the system does not adjust the delivery document quantity, but the process code will be saved in the delivery for future reference.
- **Adjustment of delivery quantity:** In this case, the system does adjust the delivery quantity and saves the process code in the delivery.
- **Adjustment of delivery quantity and delivery quantity transferred:** Here, the system updates the delivery quantity and also initiates the split delivery process for the open quantity.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Process Codes | Define Process Codes

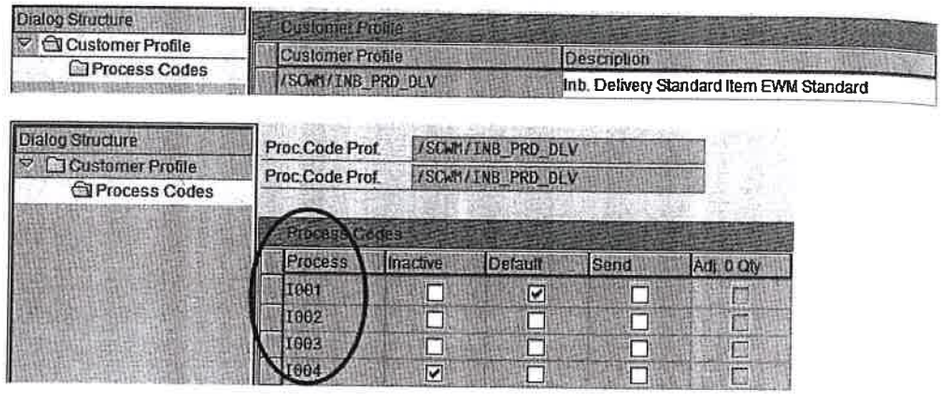


13.2.1.2 Process Code Profiles

Even though quantity adjustment settings are configured under process code, delivery quantity adjustment is governed by process code profiles, which consist of process codes.

In the configuration, each process code profile has to be assigned to the system profile. When creating a process code profile with a copy function, all the predefined process codes are automatically copied to the new process code profile. The process codes that are not required can manually be deactivated, or users can assign custom defined process codes to the process code profiles. The profiles defined here can be used for both inbound and outbound deliveries.

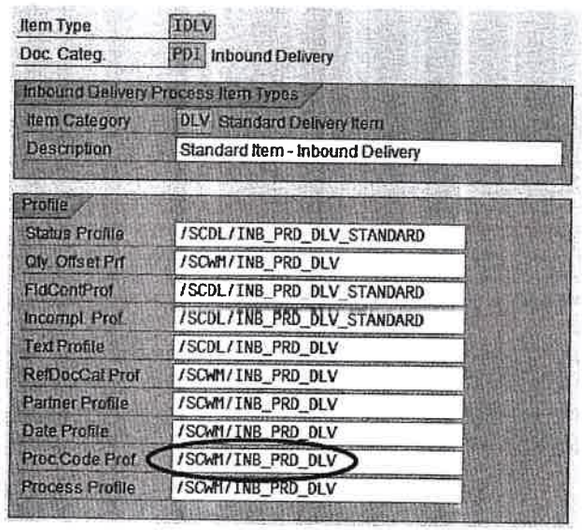
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Process Codes | Maintain Process Code Profiles



13.2.1.3 Assign Process Code Profiles to Item Types

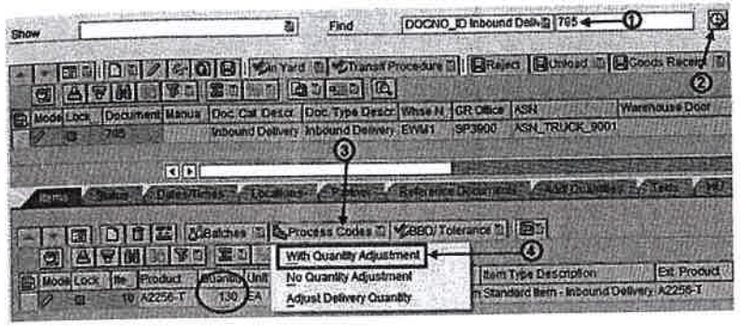
In order to use the process code profile, it is necessary to assign it to the item types.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Inbound Delivery | Manual Settings | Define Item Types for Inbound Delivery Process

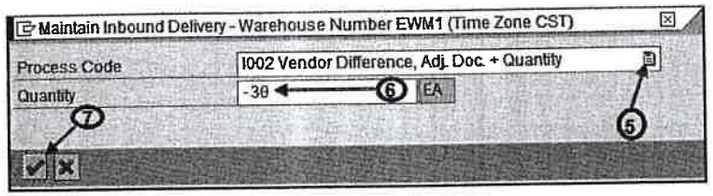


13.2.1.4 Test Configuration

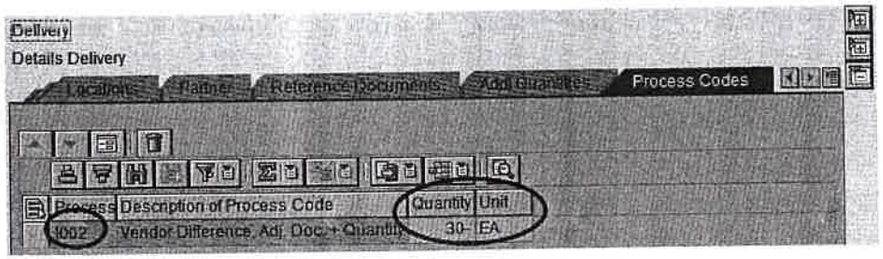
To verify the configuration, go to transaction /SCWM/PRDI and locate your partially or not processed inbound delivery. Under delivery item details, click on "Process Codes" button. Three options discussed above for the process codes can be seen here.



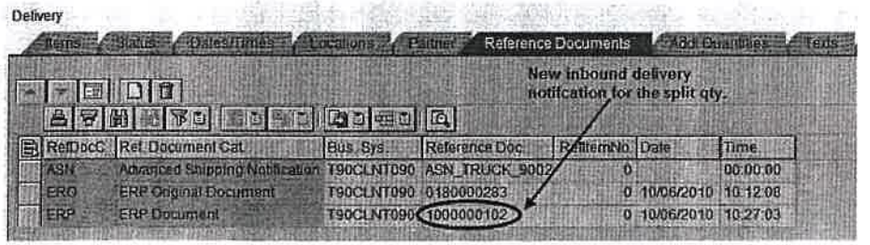
To change the delivery quantity, select "With Quantity Adjustment" option, enter the quantity and click "Enter," as shown below.



Click "Save." This will change the delivery quantity in the IDN and in the warehouse request (inbound delivery) document. In this example, it is reduced to quantity 100 EA. You can verify the changes in the "Process Codes" tab.



This will also create a new inbound delivery in the ERP system for the split quantity. This document can be verified in the "Reference Documents" tab.



In the background, the EWM system will send a message to the ERP system to update the quantity in the original inbound delivery (i.e., 100 in this example), a message with the details of the new IDN for the split quantity (i.e., quantity 30) created in the EWM system, and the IDN number. The ERP system will process these messages and update the purchase order status accordingly.

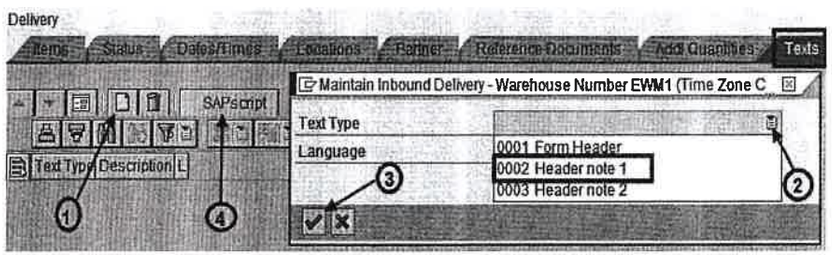
Note:

Delivery splits for outbound delivery orders work the same way as for inbound delivery.

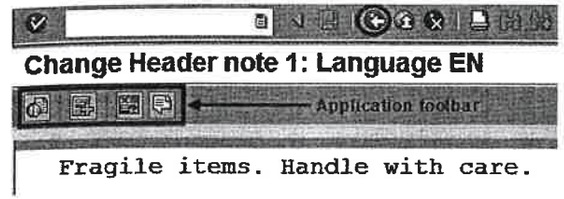
13.2.2 Text Management Profile

In EWM, Text Management profile is used to create, change, display, or delete additional texts. Texts can be received from the ERP system via delivery documents. New texts also can be created and saved within the EWM delivery document. This can be maintained in the delivery header as well as at the items level.

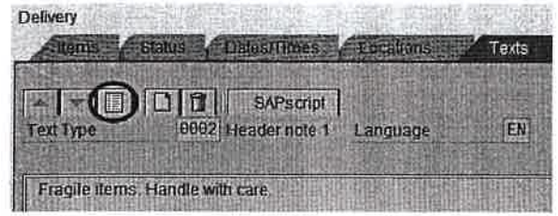
The following example demonstrates how to use text types to add the text in the delivery header.



Once the third step is completed, a new line item will be added under the text type/description area. To enter the actual text, select the line item under text type and click the "SAPscript" button (step 4). This will open a word document. Here, add text and click "Save."



Once the document is saved, the text will be available for future reference. Click on the form view to display the long text.



Text Management in delivery is governed by the text profile, which consists of text types and their access sequences. Each text profile is assigned to the system profile and to the delivery document and item types.

Defining and assigning text profile is similar to process codes profile. First, the text types for delivery header and delivery item must be defined. Second, a text profile with an access sequence must be defined.

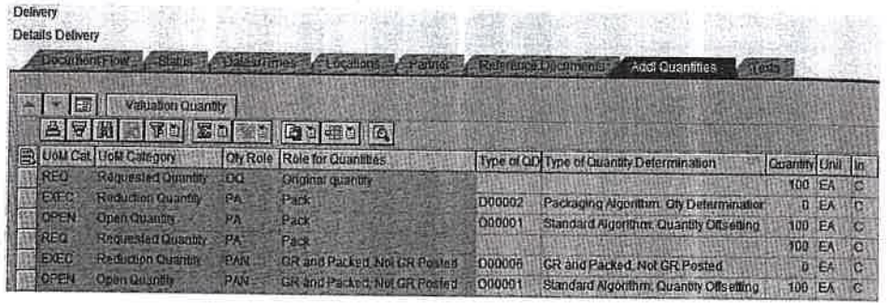
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Text Management

Once these things are defined, the text profile can be assigned to the delivery document types and/or item types.

13.2.3 Quantity Offsetting Profiles

Quantity offsetting is used to calculate the open quantities for a warehouse document for each item. This is also used to calculate the requested quantity and reduced quantity. It is always executed at the item level of a delivery document. It contains quantity calculation and quantity offsetting rules to be used by the quantity offsetting profile to calculate the desired quantity.

The following is an example shows the open quantity calculated for the inbound delivery.



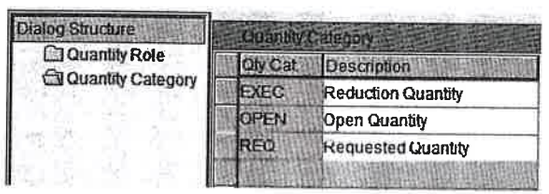
A quantity offsetting profile consists of the following components:

13.2.3.1 Quantity Categories

These classify the different quantities for each warehouse document item. Examples include requested quantity, reduced quantity (i.e., already processed quantity), open quantity (quantity remaining to process), and so on.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Quantity Offsetting | Define Quantity Roles and Quantity Types

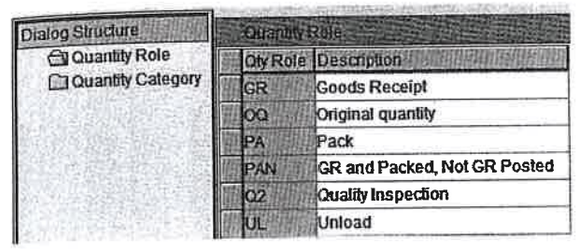
You can view the existing quantity categories by double-clicking on "Quantity Category" under the dialogue structure. Here, enter the quantity category code and description.



13.2.3.2 Quantity Role

Quantity Role is used to group quantity calculation or quantity offsetting rules for certain applications or processes. With this approach, quantity determination/offsetting rules can be defined to be either application dependent or process dependent—for example, packing, goods receipts, and goods issue. A quantity role can have several quantity types, like requested quantity, reduced quantity, and open quantity.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Quantity Offsetting | Define Quantity Roles and Quantity Types

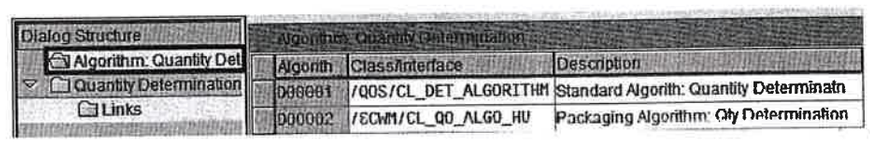


13.2.3.3 Quantity Determination Rules

Quantity determination rules define the quantity calculation rule for the relevant quantity for offsetting. It decides which algorithm is to be used to calculate the quantity for a particular combination of quantity role and quantity type. It also decides whether proceeding/follow-up documents (in document flow) should be referenced for quantity calculation.

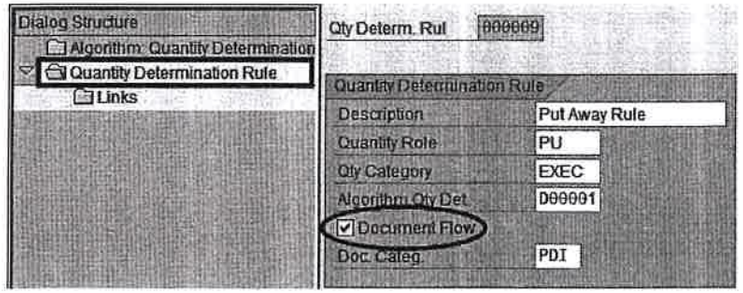
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Quantity Offsetting | Define Quantity Determination Rules

From the "Dialog Structure", both "Quantity Determination Algorithms" and "Quantity Determination Rules" can be accessed.

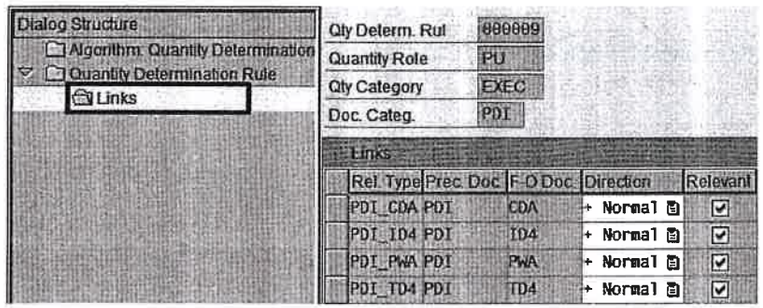


SAP has delivered several standard quantity determination algorithms. To define custom quantity determination algorithm, it is necessary to create custom class and that class has to implement interface /QOS/IF_DET_ALGORITHM.

To define the "Quantity Determination Rule", assign the quantity role, quantity category, and algorithm for quantity determination. Check the "Document Flow" check box and provide the relevant document category, if quantity is calculated from reference documents.



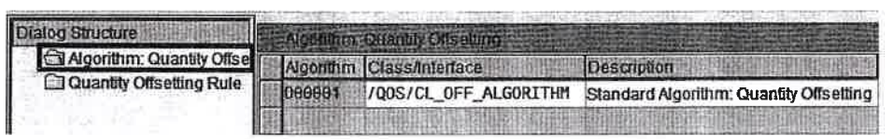
Under "Links" option, links to the reference documents ("i.e." preceding and follow-up) can be provided from the document flow table.



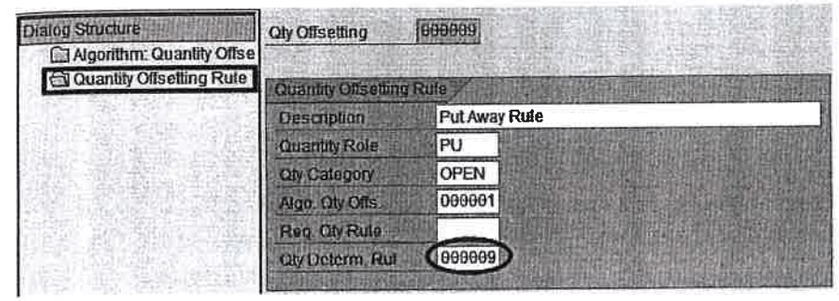
13.2.3.4 Quantity Offsetting Rules

The quantity offsetting rule is similar to the quantity determination rule. It defines the rule for calculating the open quantity. It decides offsetting algorithm and quantity determination rules used for a particular quantity role to calculate the open quantity. To define custom quantity determination algorithm, it is necessary to create custom class and that class has to implement interface /QOS/IF_OFF_ALGORITHM.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Quantity Offsetting | Define Quantity Offsetting Rules



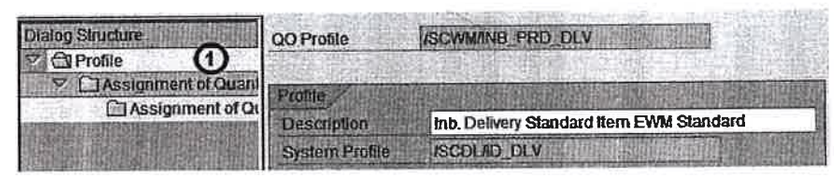
The appropriate quantity determination rule can be assigned under the quantity offsetting rule.



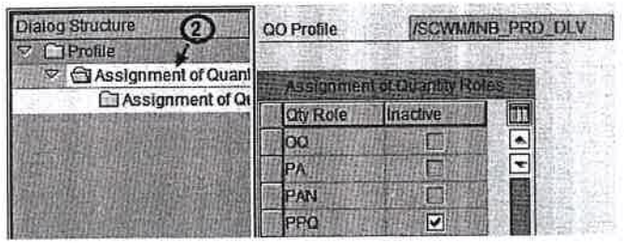
13.2.3.5 Quantity Offsetting Profile

The quantity offsetting profile is defined for a particular application to execute quantity offsetting automatically. Each quantity offsetting profile is assigned to the system profile. When the quantity offsetting profile is assigned to the system profile, all the predefined quantity roles are copied to quantity offsetting profile, where they can be used to activate or deactivate the quantity roles that are not marked as mandatory.

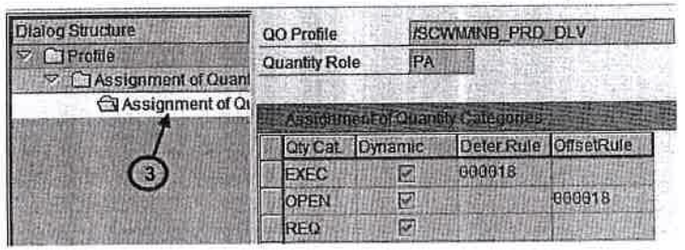
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Quantity Offsetting | Define Quantity Offsetting Profile



During assignment of quantity roles, any custom defined quantity roles can be assigned or can change the attribute of the existing roles to inactive as shown in the following screenshot.

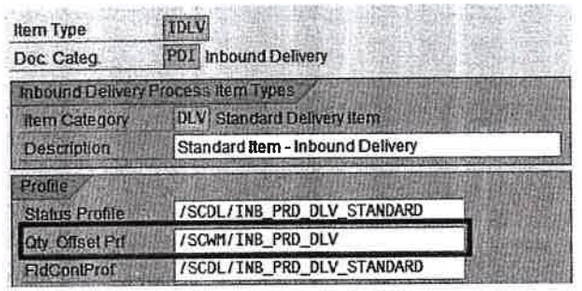


Under "Assignment of Quantity Categories", the custom defined quantity categories are assigned. Check the checkbox "Dynamic" to determine the quantities dynamically.



13.2.3.6 Assign Quantity Offsetting Profile to Item Type

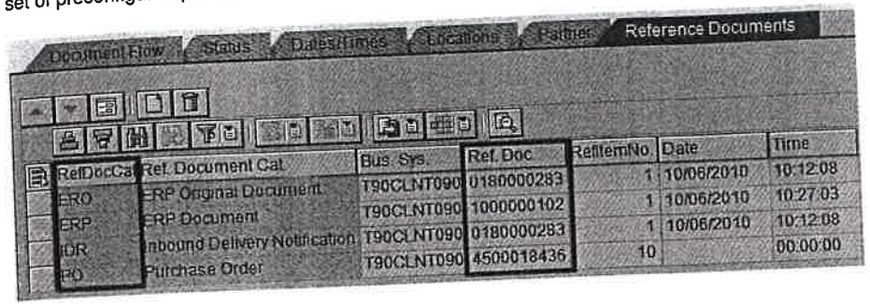
In order to use the custom defined quantity offsetting profile, it is necessary to assign it to the document types or item types. The quantity offsetting profile defined here can be used for both inbound and outbound deliveries.



Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Inbound Delivery | Manual Settings | Define Item Types for Inbound Delivery Process

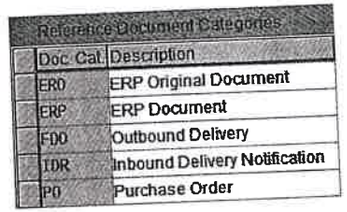
13.2.4 Reference Document Profiles

Reference document profiles determine which reference documents are allowed for a delivery document. The reference documents profile is assigned to the document categories. SAP provides a set of preconfigured profiles for the standard delivery document and item category.



13.2.4.1 Reference Document Categories

Reference document categories are used for linkage with the documents used in delivery processing. The data is copied from the reference document to the linked document.

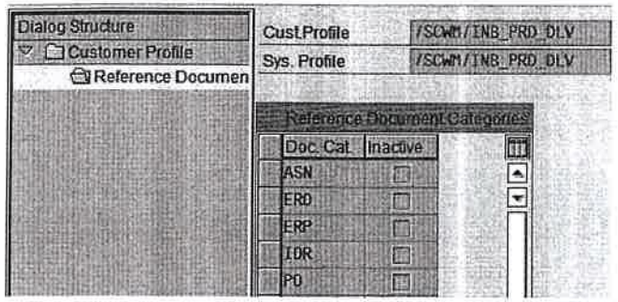


Menu Path: SPRO | IMG | Extended Warehouse Management | Delivery Processing | Reference Documents | Define Reference Document Categories

13.2.4.2 Reference Document Type Profiles

Reference document type determination is governed by the reference document type profile, which consists of reference document categories. The reference document type profile is also assigned to the system profile.

Menu Path: SPRO | IMG | Extended Warehouse Management | Delivery Processing | Reference Documents | Define Reference Document Type Profiles

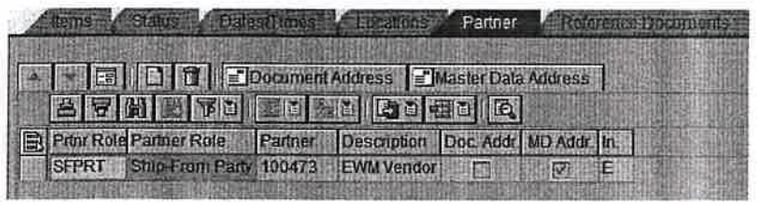


13.2.4.3 Assign Ref. Doc. Type Profiles to the Document or Item Type

If a custom profile is defined, it must be assigned to the appropriate document type or item type.

13.2.5 Partner Processing

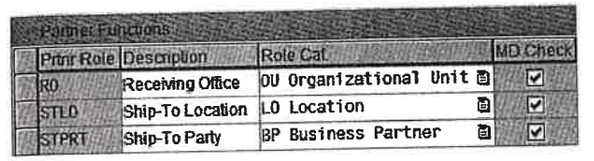
Partner processing is the function that makes it possible to maintain partner information in the header and/or item level in the delivery documents. In this section we will explore the configuration of defining partner roles and partner profiles and assigning the partner profiles to the document or item types.



13.2.5.1 Partner Roles

Partner roles are used to represent a role or function in the business process such as suppliers, ship-to, buyer, and so on. They are defined with a unique key, description, and role category. The role categories are predefined by SAP. They include business partner, location, and organization. Once the partner roles defined, they need to be assigned to the appropriate partner profiles. If the master data is to be referenced for the partner data, the "MD" check box must be active.

Menu Path: SPRO | IMG | Extended Warehouse Management | Delivery Processing | Partner Processing | Define Partner Roles



13.2.5.2 Partner Profiles

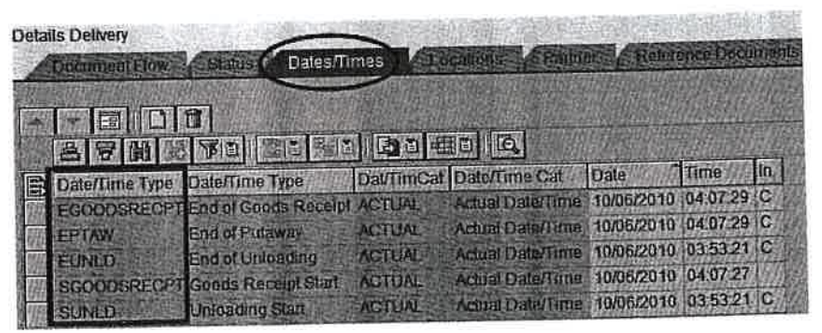
Partner profiles contain partner roles and are assigned to the delivery document types and item types. SAP has provided several predefined partner profiles. In the predefined profiles, SAP has assigned mandatory as well as optional partner roles. If these profiles are not sufficient, customers can define their own partner profiles in menu path **SPRO | IMG | Extended Warehouse Management | Delivery Processing | Partner Processing | Define Partner Profiles**

13.2.5.3 Assign Partner Profiles to the Document or Item Type

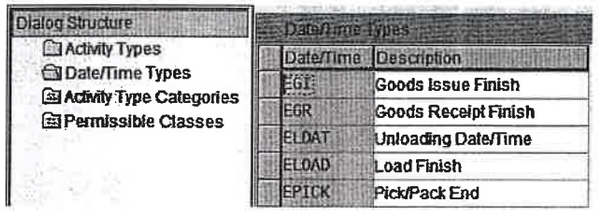
Once the partner profiles are defined, they must be assigned to the appropriate document or item type of inbound or outbound delivery.

13.2.6 Dates/Times Profile

The dates that are supported in EWM are defined as date types—for example, delivery date, GR date, GI date, and so on. Time is always recorded as part of a date type. In EWM, new date types can be configured using the date type functionality.



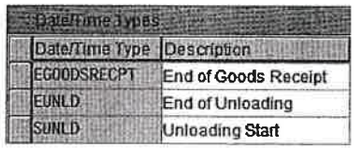
Importantly, the EWM date types should match the date types defined in configurable process scheduling. **Menu Path: SPRO | SCM Basis | Configurable Process Scheduling | Scheduling Schema | Define Elements of Schema > Date/Time Types**



13.2.6.1 Define Date Types

This defines the date type key (maximum of twelve characters long) and a description for the date type.

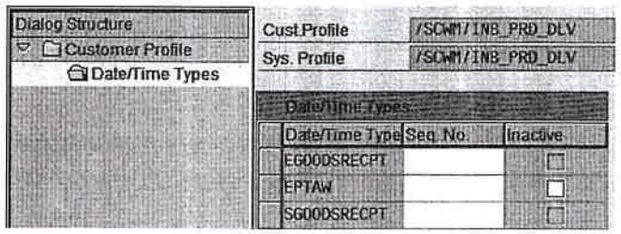
Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Dates/Times | Define Date Types



13.2.6.2 Define Date Profiles

Date type determination in delivery is governed by the date type profile, which consists of date types. Each date type profile is assigned to the system profile. When the date type profile is assigned to the system profile, all the predefined date types are copied to the date type profile. As with any other profile, the existing values of the date types that are not mandatory can be changed, or customers can define their own date types.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Dates/Times | Define Date Profiles

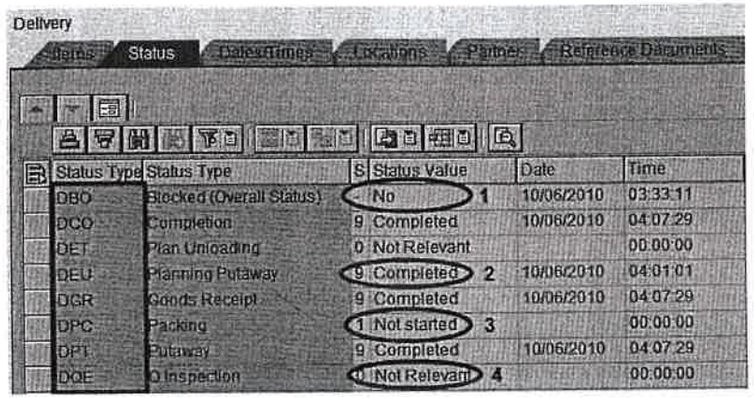


13.2.6.3 Assign Date Profile to the Document or Item Type

Finally, like any other profile, the date profile must be assigned to the document or item type.

13.2.7 Status Management

In EWM, the status management configuration is used to allow and restrict certain functionalities in the warehouse document. It also shows the sub status of each status type (i.e., started, in process, or completed). Status management in delivery is governed by the status profile, which consists of status types and status values, as shown below.

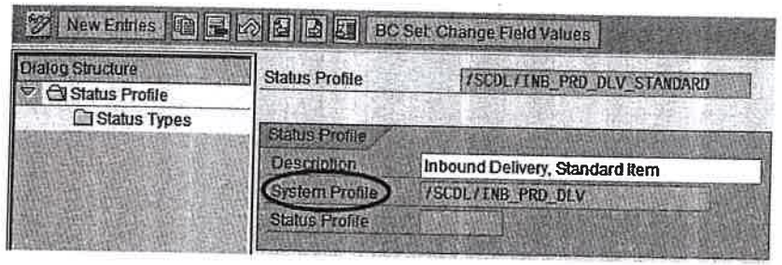


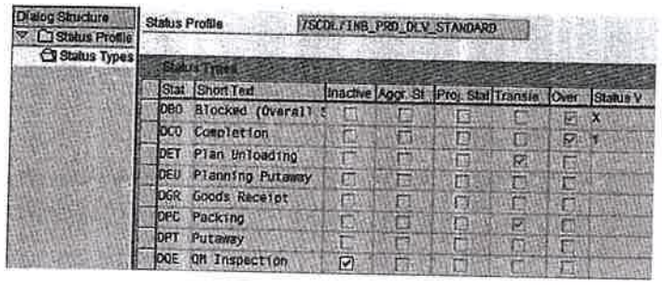
13.2.7.1 Status Profiles

A status profile consists of various status types and is assigned to the system profile. When it is assigned to the system profile, all the predefined status types are copied to the status profile. You can manually change the settings of attributes for status types that are not marked as mandatory. The system will not allow changes to the settings of attributes for mandatory status types in the status profile.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Status Management | Define Status Profiles

The following is an example of a standard status profile used in the EWM system for inbound delivery. Users can define their own status profile by clicking on "New entries."





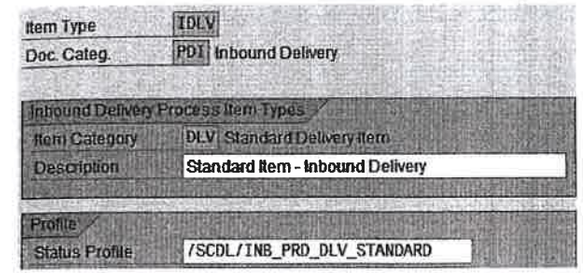
The following attributes are available for each status types.

- **Inactive:** Not all statuses can be changed to inactive. If changes are permitted, you can change the attributes of status types as per your requirement
- **Aggregated Status:** The system calculates the status value of such a status type from the status values of all the partial objects in a lower document level
- **Projected Status:** The system calculates the status value of such a status type from the status type with the same name from higher document levels
- **Overall Status:** The status value for this is calculated from current status values of a predefined quantity of status types from the same partial object
- **Transient Status:** The system only calculates this status type for the runtime. The status type is not saved permanently

13.2.7.2 Assign Status Profile to Item Type

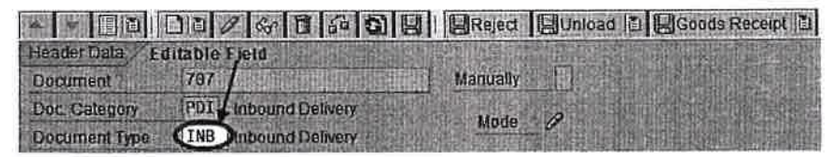
In order to use the status profile, it must first be assigned to the document types or item types. The status profiles defined here can be used for inbound and outbound deliveries.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Inbound Delivery | Manual Settings | Define Item Types for Inbound Delivery Process



13.2.8 Field Control

Field Control decides which fields in a delivery document should be display only and which can be edited or hidden at various statuses of the document. Field control supports fields at the header and item level of a document. It is also dependent on status management.



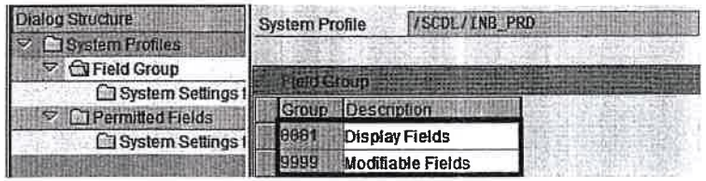
The field control can be accessed at the time of creation, change, or display of a document or a document item. It is governed by the field control profile, which consists of structures. All fields in a delivery document are defined in the system as components of structure. Every component in a structure is uniquely identified by the logical field name and can be addressed directly.

Each field control profile is assigned to the system profile. Like other profiles, when the field control profile is assigned to the system profile, all the predefined logical field names along with the attributes (display, hide) are copied to the field control profile. The attributes of the fields are controlled by the field group. By default, most of the fields belong to group number 0001 and are display only.

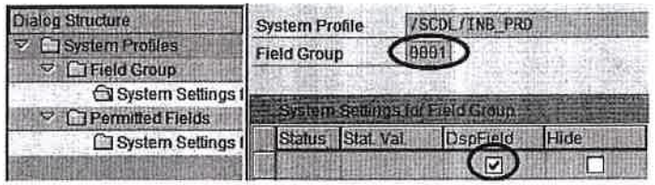
The following example demonstrates how to make the document type field "inbound delivery" editable.

- **Define a new field group:** Here, copy group 0001 to a new group a new group. We have created a new group called 9999.

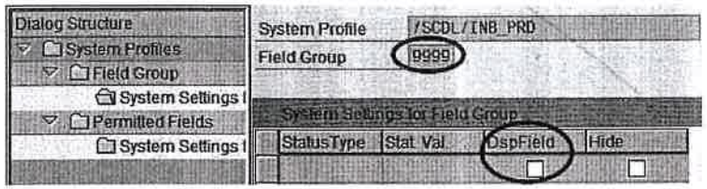
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Extend Delivery Processing | Extend System Profiles for Field Control



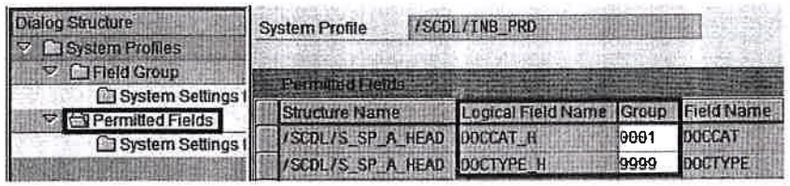
Verify the attribute values for field group 0001.



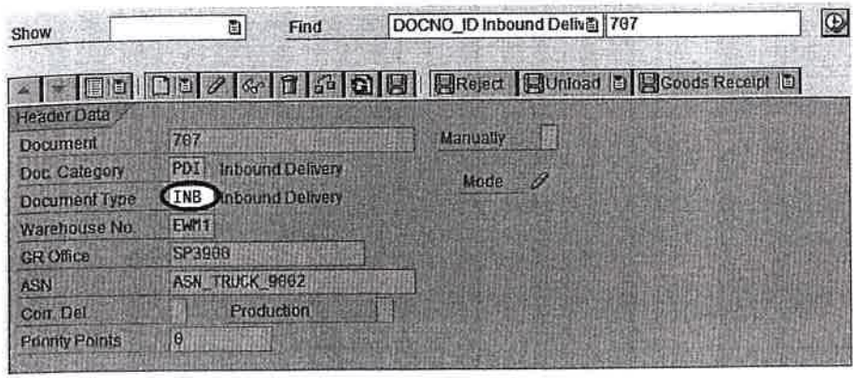
For group 9999, uncheck the "DSPFIELD" check box to allow changes.



Next, assign the group to the logical fields under permitted fields.



Once the required configuration is completed, the changes can be verified in the delivery document. The following is the example of inbound delivery (TCode /SCWM/PRDI), for which group 9999 is active and the document type field is now editable.



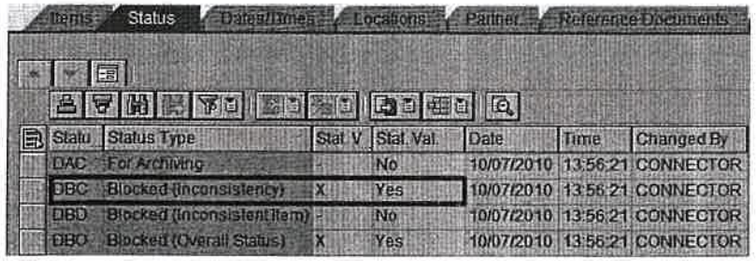
Filed control settings can be configured in the following configuration menu:

- **Define logical field names:** This option is available under **SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Extend Delivery Processing | Define Logical Field Names**
- **Extend system profiles for field control:** This can be accessed under **SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Extend Delivery Processing | Extend System Profiles for Field Control**

Finally, depending on the requirement, the field control profile has to be assigned to the document type and item type.

13.2.9 Incompleteness Check

This is used to ensure that all required fields in the delivery documents have been filled or completed before initiating the next process. If the required condition is not fulfilled, the system will set the status of the document as an error or inactive, and the document will be blocked for inconsistency.



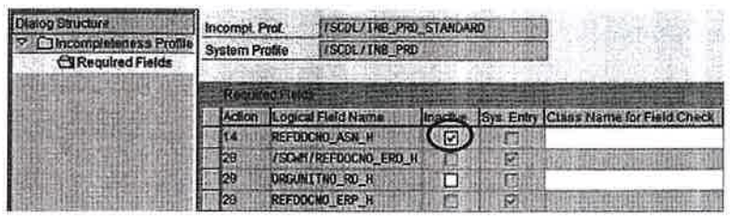
13.2.9.1 Incompleteness Profiles

The incompleteness check in the delivery is governed by the incompleteness profile. In configuring the incompleteness profile, the settings of the logical fields can be changed. Each field consists of a business action code such as "Save", "Goods issue", or "Check", which determines when the field is checked for completeness.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Incompleteness Check | Define Incompleteness Profiles

Here, select the required incompleteness profile and click on the "Required Fields" option under the dialog structure. To add new logical fields, click the "New" button. It is possible to inactivate the verification for various fields, by selecting the "Inactive" check box.

In the following example, inbound delivery is allowed to process in the warehouse without an ASN document number (REFDOCNO_ASN_H) in the inbound delivery.

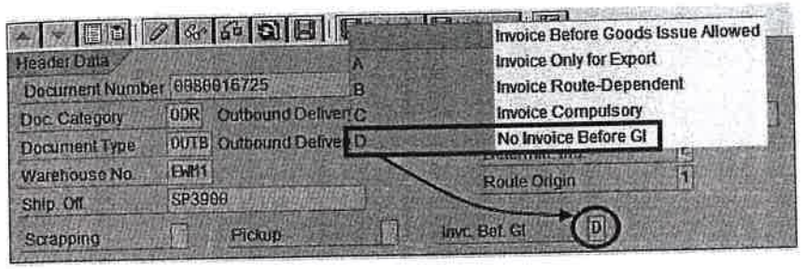


13.2.9.2 Assign Incompleteness Profile to the Doc. or Item Type

Depending on where the incompleteness check is to be used, the profile can be assigned to the document or item type.

13.2.10 Process Management (Mgmt.) and Control

Process management and control plays an important role in delivery processing. It controls whether certain process are allowed for a delivery type. Process control indicators can be set for header and item level. The following screenshot shows that invoice creation before goods issue is not allowed in outbound delivery 80016725.

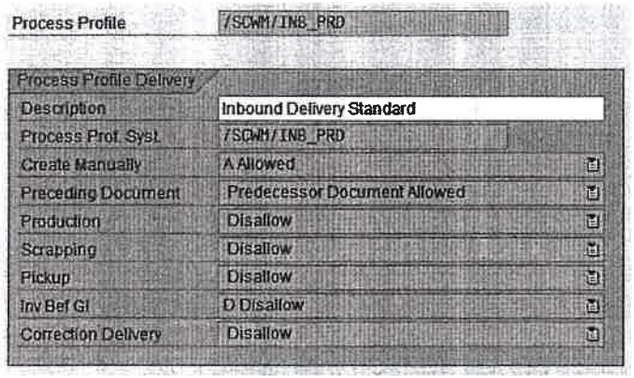


13.2.10.1 Process Profile for Delivery Document Header

The following indicators can be set for the delivery header profile:

- **Manual Creation:** Specify whether a document can be created manually or not.
- **Preceding Document:** Specify whether a reference to a preceding document is allowed or not.
- **Scrapping:** Specify whether scrapping is mandatory or disallowed for the document. If it is set to mandatory, it shows that the document type is relevant for the scrapping process.
- **Pickup:** Specify whether a pickup is mandatory or disallowed for the delivery document. For example, for a construction project, the tools can be issued to a worker directly from the warehouse without a sales order and with reference to a cost center. In this case, the workers will pick up the stock directly from the warehouse and no transportation is involved. In this scenario, stock is issued by creating an outbound delivery order locally in EWM system without reference to a sales order. For these deliveries, once the goods issue is complete, the process is complete.
- **Invoice before goods issue:** This does allow creating an invoice before the goods issue.
- **Correction Delivery:** Allows posting of a differences to the stock and the difference to be cleared using a correction delivery document.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Process Management and Control | Define Process Profile for Delivery Document Header

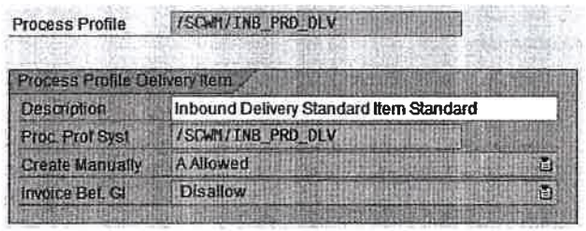


13.2.10.2 Process Profile for Delivery Document Item

The following indicators can be set for the delivery item:

- **Manual Creation:** This allows creating an item in the delivery manually without reference to a line item in the preceding document.
- **Invoice before Goods Issue:** This allows billing of a line item before its goods issue posting.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Process Management and Control | Define Process Profile for Delivery Document Item



13.2.10.3 Assign Process Mgmt. and Control to the Doc. or Item Type

Depending on where the process management and control is to be used, the profile is assigned to the document or item type.

13.3 Delivery Processing—ERP Integration

From an integration perspective, it is important to understand the basic EWM integration setting for delivery documents. This section will review those settings. Table 13.3A provides an overview of configurations covered under this section.

S. No	Delivery Processing - ERP Integration	TCode	System	Transportable
1	Define ERP Document Types for Differentiation Attribute	SPRO	EWM	Yes
2	Map Document Types from ERP System to EWM	SPRO	EWM	Yes
3	Map Item Types from ERP System to EWM	SPRO	EWM	Yes
4	Map Date Types from ERP System to EWM	SPRO	EWM	Yes
5	Define Account Assignment Category	SPRO	EWM	Yes
6	Map Routes and Route Schedule from ERP System to EWM	SPRO	EWM	Yes

Table 13.3A Delivery Processing Integration Overview

13.3.1 ERP Document Types for Differentiation Attribute

The differentiation attribute makes it possible to map an ERP item type onto various item types in EWM. This means that the items can be controlled in different ways in EWM under different scenarios.

SAP has delivered four predefined profiles that can be assigned to ERP delivery type. They include the following:

- **RETCU:** Customer returns.
- **SCRAP:** Scrapping deliveries.
- **TRANS:** Stock transfers.
- **ITEM:** This can be used as a general differentiation attribute.

These profiles cannot be changed or enhanced. Each profile has exactly one field of the delivery interface for the ERP system. The field receives the values from the ERP system that were defined for a specific domain. The value of the field can be used as a differentiation attribute for mapping item types from ERP to EWM, which is covered below in section 13.3.3.

SAP has provided mapping for all the standard document types. Hence, no additional configuration is required for the standard ERP document types.

Menu Path: SPRO | IMG | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Define ERP Document Types for Differentiation Attribute

Determine Differentiation Attribute for Item Type Mapping

DocTypeE	Business System	Profile
DIG		TRANS
DOG		TRANS
DTR		SCRAP
EL		TRANS
NL		TRANS
SRCL		RETCU
SRNP		RETCU
SRUP		RETCU

13.3.2 Map Document Types from ERP to EWM

For data exchange between ERP and EWM systems, document types from the ERP system must be mapped to the document types of the EWM system.

SAP has provided mapping for all the standard delivery document types. Hence, no additional configuration is required for the standard document types. All these settings exist in a table used to cross-reference the ERP delivery document type to the EWM delivery document type. Diagram 13.3.2A shows how the EWM delivery document type gets determined for the ERP delivery document type. The system will always search for a more specific entry rather than a generic entry in the table.

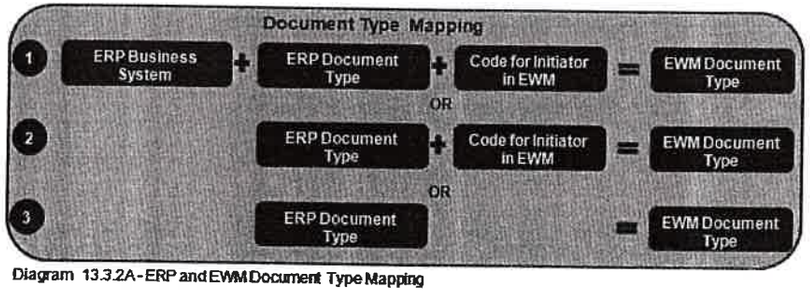


Diagram 13.3.2A - ERP and EWM Document Type Mapping

Menu Path: SPRO | IMG | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Map Document Types from ERP System to EWM

Mapping Delivery Type - Document Type

Business System	DocTypeERP	Cde Init. Com.	Doc. Type
	EL		INB
	EL	GRN	EGRE
	LF		OUTB

13.3.3 Map Item Types from ERP to EWM

In addition to mapping the delivery document types, the integration between the ERP and EWM system includes mapping item types from the ERP to EWM systems. SAP has delivered mapping for all the standard delivery item types. Hence, no additional configuration is required for the standard item types.

Diagram 13.3.3A shows how the EWM delivery item type gets determined for the ERP delivery item type. The system will search for a more specific, rather than generic, entry in the table. The ERP item type is referred as "item category" in the ERP system.

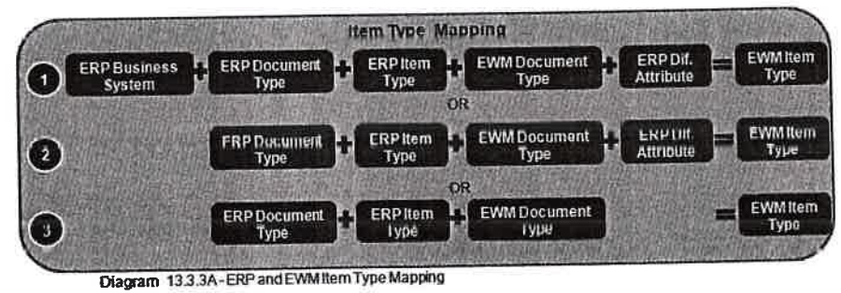


Diagram 13.3.3A - ERP and EWM Item Type Mapping

Menu Path: SPRO | IMG | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Map Item Types from ERP System to EWM

Mapping of ERP Item Type

Busin	DocTypeERP	ItmTpERP	Doc. Type	Diff Attr.	CW Product	Item Type
	EL	ELN			☐	IDLV
	EL	ELN			☑	IDCW
	EL	ELN		A	☐	IDTR
	EL	ELN		A	☑	ITCW
	EL	ELN		D	☐	IDTR

13.3.4 Map Date Types from ERP to EWM

Like delivery item types, the system uses business system, ERP date type, and EWM document and item type to determine date types in the EWM system. SAP has provided mapping for all the standard date types. Hence, no additional configuration is required for the standard date types.

Menu Path: SPRO | IMG | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Map Date Types from ERP System to EWM

Mapping ERP Date/Time Types

Busin	DType ERP	Doc. Type	Item Type	Start Date	End Date	Conf.D/T
	WSHDRLFDTI	INB	IDCW	SGOODSRECPT	EGOODSRECPT	E Confirm End Date
	WSHDRLFDTI	INB	IDLV	SGOODSRECPT	EGOODSRECPT	E Confirm End Date

13.3.5 Account Assignment Category In Warehouse Number

The system uses the settings of the allowed account assignment categories in a warehouse number to determine which account assignments can be created or displayed in outbound delivery orders in EWM. SAP has the following account assignment categories as standard:

- "10 - Cost center"
- "11 – Order"
- "12 – Project"

When working with the standard account assignment categories, consultants should assign the existing account assignment categories to their client's warehouse number.

Menu Path: SPRO | IMG | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Define Account Assignment Category and Allow in Warehouse Number

Dialog Structure
- Account Assignment Category
  - Warehouse Number

Warehouse Number

War	AC	Acc Assign Cat. Name
SEWM	11	Order

13.3.6 Map Routes and Route Schedule

This configuration sets which route data or route schedule data is to be copied from ERP to EWM. Here, the two important terms are Route (SD) and Route (SCM).

- **Route (SD):** A route that can be entered in the sales order in ERP or determined by ERP route determination. This route is called an ERP route.
- **Route (SCM):** A route used in SCM/EWM route determination. This can be also transferred from a CRM system. This route is called the Geo route.

Menu Path: SPRO | IMG | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Map Routes and Route Schedule from ERP System to EWM

Here, enter ERP business system name in the business system field, ERP warehouse number in the Whs. No. ERP field, and select one of the following values in mapping route field:

- **Standard setting use route (SCM):** The route may come from a SCM system. This route is usually filled when working with CRM, in which routes from an SCM system are used (e.g., by availability check).
- **Use route (SD) if route (SCM) is initial or blank:** An SD route that may exist in documents is only used if the route (SCM-EWM) is not filled at the same time.
- **Use route (SD) if route (SD) and route schedule are filled:** An SD route that may exist in documents is only used if the SD route and route schedule are transferred from ERP.

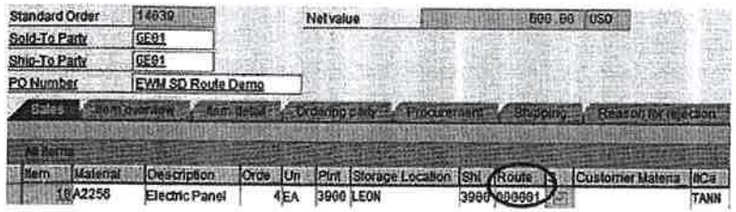
Business System: SE1CLNT410
Whse No. ERP: EWM

Map Routes / Route Schedule from ERP System to EWM
Mapping Route: 1 Use Route (SD) If Route (SCM) Is Initial

The following example demonstrates that the SD route is copied to EWM delivery because the SCM route is blank.

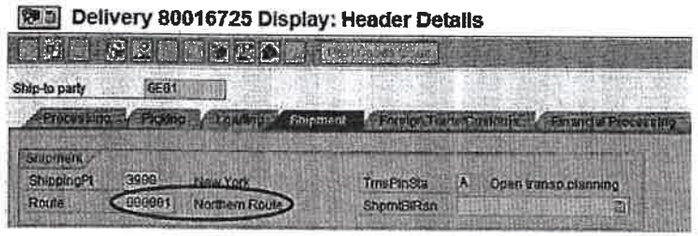
- **ERP Sales Order—Transaction VA01:**

In ERP system, create a sales order and verify that the route is filled in the sales line items. Make sure that the plant and storage location is EWM relevant.



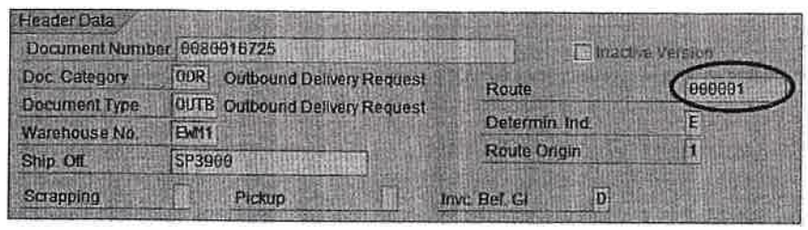
▶ ERP Delivery (TCode VL01N)

After creating the sales order got to transaction VL01N and create a delivery document. Verify that the route is copied to the outbound delivery from the sales order. This information is available in the shipment tab, as shown below.



▶ Outbound Delivery Request (ODR) In EWM system (TCode /SCWM/ODR)

Because the plant and storage location is EWM managed, the system will automatically transfer the content of the ERP delivery document to the EWM system, and the corresponding ODR document will be created. The ODR number will be same as the ERP delivery document number. In ODR, route information should show in the header data of the ODR document, as shown below.



Summary

This chapter explained the delivery document structure, various delivery processing profiles used in the delivery document, integration with ERP document types, and delivery processing. It also demonstrated how delivery processing profiles influence the delivery document.

By now, all the required settings in the ERP and EWM system have been covered. The next chapter will discuss how to process documents in the EWM system and will also cover the goods receipt and putaway process in both the ERP and EWM systems.

Chapter 14: Goods Receipts and Putaway

This chapter covers, along with examples, the goods receipts (GR) process overview, configuration of the direct putaway process, unloading, GR, creating WTs, and processing of WOs. By the end of this chapter, it should be clear how to perform GR, create various putaway-related documents in the warehouse, and how to confirm WTs and WOs.

14.1 GR Process Overview

In general, there are four major ways that goods can be received in the EWM system. They include:

- Advanced Shipping Notification (ASN/inbound delivery document)
- Expected Goods Receipt (EGR)
- Returns
- Production Receipt

14.1.1 Advanced Shipping Notification (ASN)

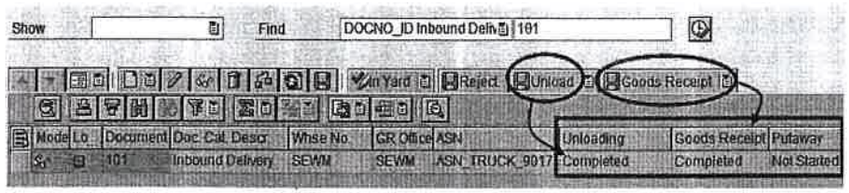
ASN is a document or delivery confirmation received from the vendor, containing the details of the customer purchase order, products, and the quantities that are dispatched from the vendor location to the customer location. Based on the ASN information, inbound delivery will be created either manually or through Electronic Data Change (EDI) in the ERP system, which gets automatically transferred to the EWM system in the form of incoming messages. In the EWM system, these messages are converted into an IDN document. The IDN number will remain same as the inbound delivery number of the ERP system. IDN documents are mainly used for planning purposes.

In order to process IDN, it has to be converted into inbound delivery (ID) which is also called a warehouse request. This can be done manually or automatically, using PPF. In the standard system, by default it is automated, using PPF.

GRs can be posted manually with reference to inbound delivery, before the WTs are created, or they can be posted automatically when the WO is confirmed.

WTs cannot be created with reference to IDN. In order to create WTs for GRs, the IDN has to be converted into ID. WTs are used to create WOs, which are then used to putaway the products in the warehouse.

The following screenshot shows how to perform unloading and GR activities with reference to ID without creating the WTs.



14.1.2 Expected Goods Receipt (EGR)

Usually, EGR is used in the absence of ASN. Diagram 14.1.2A shows the process flow followed in case of EGR. The GRN (Expected Goods Receipt Notification) document is created in the EWM system with reference to either a purchase order or a production order. It contains a copy of all the data from the source document. The EGR document is created from the GRN after it has been activated. Once the EGR is created, it is possible to create an inbound delivery from an EGR document.

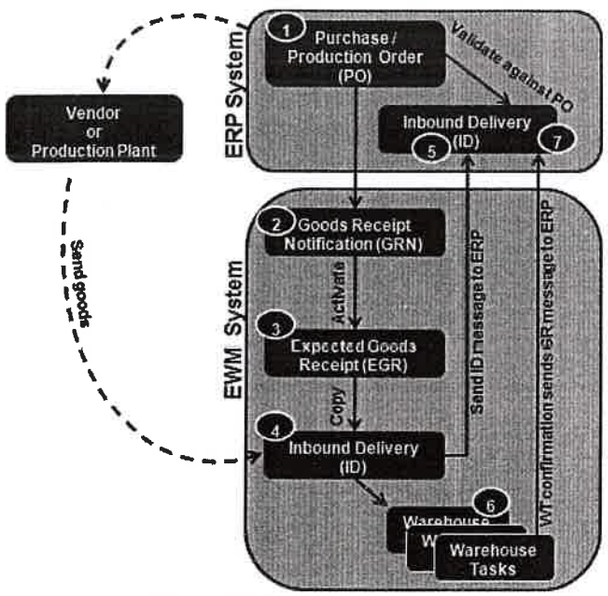
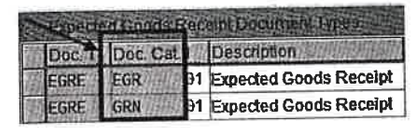


Diagram 14.1.2A – EGR Process Flow

EGR is a temporary document, and when EWM no longer requires it, the system deletes it. It only acts as a template for copying existing data from GRN, and none of this data can be changed. In the related inbound delivery, however, the data like quantity can be changed. When the inbound delivery is created in the EWM system, the system sends the message to the ERP system, which creates the inbound delivery with reference to the source document in the ERP system.

During this process, EWM neither updates the EGR nor offsets the quantity for EGR. It is also important to note that as of EWM 7.0, the system does not show EGR in the document flow of the inbound delivery.

The document type used for EGR is EGRE, and the document category is GRN and EGR.



Doc. T	Doc. Cat.		Description
EGRE	EGR	01	Expected Goods Receipt
EGRE	GRN	01	Expected Goods Receipt

In the EWM system, report /SCWM/ERP_DLV_DELETE can be used to delete the existing EGR and request new EGR from the ERP system for selected criteria.

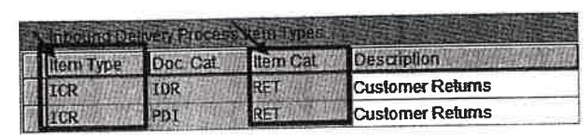
The configuration for EGR can be found in the menu path **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Expected Goods Receipt**

Just like ASN, in TCode /SCWM/PRDI, GRs can be posted manually with reference to inbound delivery before the WTs are created, or they can be posted automatically when the WO is confirmed.

14.1.3 Returns

In EWM, the term *returns* refers to returns from customers (i.e., from ship-from party or from ship-from location). Usually, once these goods arrive in the warehouse, they need to be putaway again may be after the quality inspection, if required, or they may be scrapped.

For returns, the item type used in EWM is ICR, the item category is RET, and the document categories are IDR and PDI.



Item Type	Doc. Cat.	Item Cat.	Description
ICR	IDR	RET	Customer Returns
ICR	PDI	RET	Customer Returns

14.1.4 Production Receipt

As explained in the EGR section, in EWM, it is possible to post GRs for produced goods via EGR or using an inbound delivery. Inbound delivery can be initiated from the ERP side or from the EWM side.

In case of inbound delivery, when the last production step is confirmed for a EWM warehouse-managed product, ERP generates an inbound delivery instead of a material document. This delivery document provides information about material and quantity being produced. The document type used here is INBI (Inbound Delivery from Production) to differentiate from inbound delivery from Purchase Order (INB), and the document categories are IDR and PDI.

Inbound Delivery Process Document Types

Doc. Type	Doc. Cat.	nt NRI	Description
INBI	IDR		Inbound Delivery Notif. GR Production
INBI	PDI	01	Inbound Delivery GR Production

14.2 Warehouse Putaway

In the warehouse, product putaway can be done in four different ways:

- Direct Putaway
- Process-Oriented Putaway
- Layout-Oriented Putaway
- Combination of Both Process- and Layout-Oriented Putaway

This chapter will cover direct putaway. In the next chapter, process-oriented putaway and layout-oriented putaway are covered in detail under storage control.

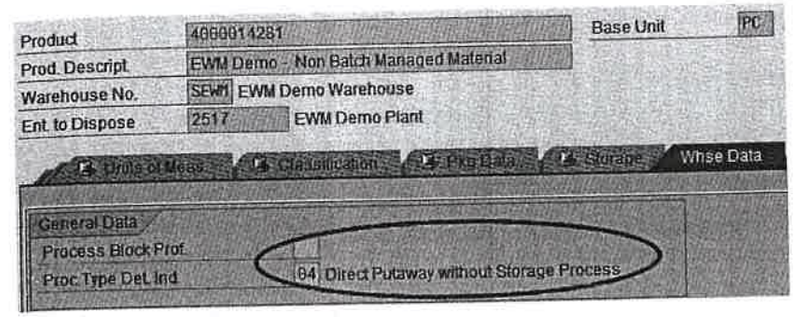
14.3 Direct Putaway

Direct putaway can be used for all the GR scenarios explained above. Here, an ASN example will be used to putaway the stock. This section will explain how to define the configuration, set up the required master data, and process the various documents, with an actual example all the way from purchase order to putaway in the warehouse, along with TCodes.

14.3.1 Product Master

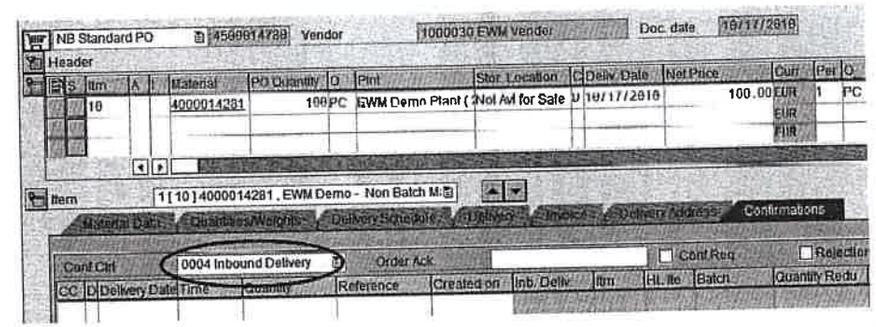
In the warehouse, the putaway process is derived by the product master (TCode /SCWM/MAT1). In order to use a direct putaway process, the process type determination indicator for the product must be

set in the product master, as shown below. SAP delivered process type determination indicator for direct putaway is "04—Direct Putaway". This is the key that drives this process.



14.3.2 Purchase Order

To demonstrate the direct putaway process, we created a purchase order in the ERP system (TCode ME21n). In the purchase order we used a material that has setup for direct putaway in the EWM system, the plant, and vendor, were already transferred to the EWM system and the storage location entered for tho material in the purchase order is configured as EWM relevant.



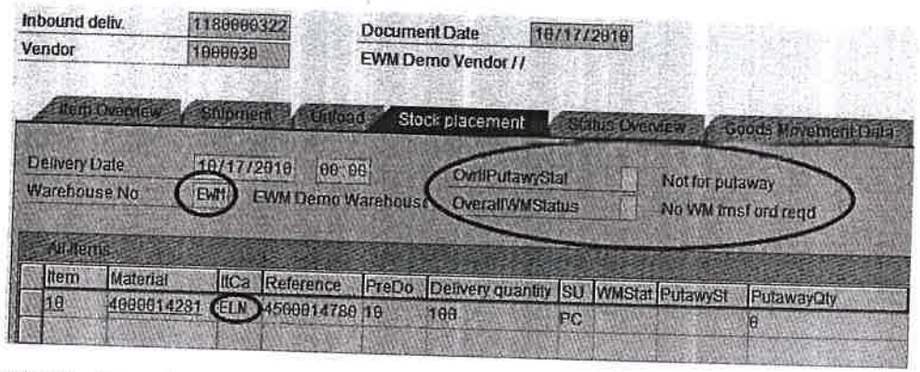
One of the requirements for the ASN process is that a purchase order line item must have confirmation control key, which allows the creation of inbound delivery. The SAP-delivered control key to create inbound delivery is "0004—Inbound Delivery".

14.3.3 Inbound Delivery (ASN)

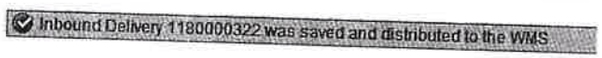
When a vendor sends delivery confirmation (ASN), inbound delivery can be created in the ERP system manually, using transaction VL31N, or automatically through an EDI process. To create an inbound

delivery in the ERP system, go to transaction VL31N, enter vendor, purchase order number, and the external ID, and hit "Enter." Change the proposed quantity to ASN quantity, if it is different.

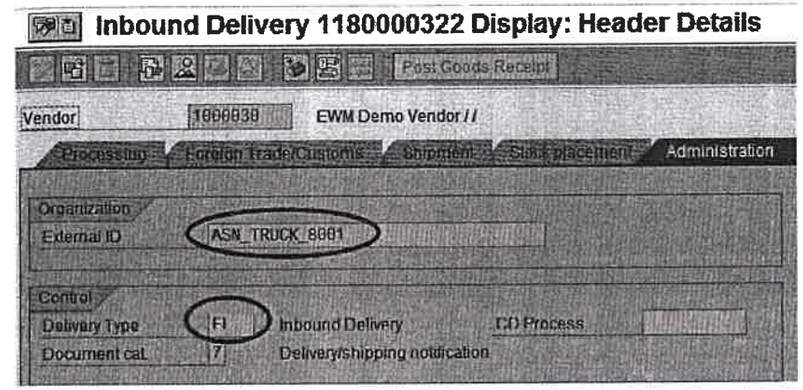
Under the stock placement tab, verify the warehouse number, putaway status, and WM status. Because the warehouse number is linked to the EWM warehouse, neither putaway nor WM status are applicable in the ERP system.



When the inbound delivery is saved, the system will automatically transfer the inbound delivery to the EWM system via qRFC. The message issued at the time of saving the inbound delivery confirms that inbound delivery is transferred to the EWM system. This status will be saved in the header data of inbound delivery under the stock placement tab in the decentralized warehouse field.



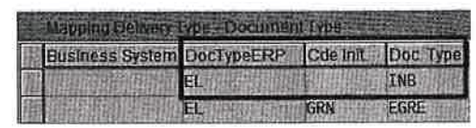
In the standard EWM system, usually the ASN number is set to "mandatory" in the incompleteness profile. In this case, the inbound delivery should contain the ASN number, which can be entered in the "External ID" field of the inbound delivery at the time of inbound delivery creation.



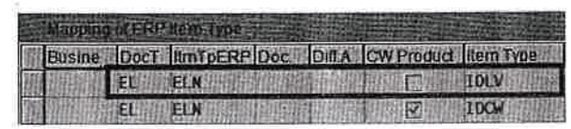
14.3.4 Document and Item Type Determination in the EWM System

As explained earlier, in order to create an IDN, the system should determine the document type and item type for the IDN.

Based on the settings in the EWM system, under menu path **SPRO | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Map Document Types from ERP System to EWM**, the EWM system will determine the document type for the IDN. In this case, the document type of ERP inbound delivery is EL, and the corresponding EWM document type will be INB.



Next, based on the settings in **SPRO | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Map Item Types from ERP System to EWM**, the EWM system will determine the item type for IDN based on the ERP document type and item type. In this example the item type IDLV is determined for ERP document type EL and item category ELN.



14.3.4 Status Profiles Determination in the EWM system

Once the document and item type are determined, the EWM system will determine the various profiles for the document header and document items.

For the header, the system will use the document type and category to determine the appropriate profiles. The document category gets determined internally by the system.

For the header profiles, settings are made under menu path **SPRO | Extended Warehouse Management |Goods Receipt Process | Inbound Delivery | Manual Settings | Define Document Types for Inbound Delivery Process**

To keep the IDN number the same as the EHP IDN, no internal number range should be assigned for document type INB or document category IDR, as shown below.

Inbound Delivery Process Document Types

Doc. Type	Doc. Cat.	Int. NRI	Description	Ret.Period	C	Act. Prof.	Inc.Prof.
INB	IDR		Inbound Delivery Notification	365	✓	/SCDL/IDR	/SCDL/INB_REQ_STANDARD
INB	PDI	01	Inbound Delivery	365	✓	/SCDL/PRD_IN	/SCDL/INB_PRD_STANDARD

For item-related profiles, the system uses the item type, document category, and item category information. For IDN, the item type is IDLV, document category is IDR, and item category is DLV.

Inbound Delivery Process Item Types

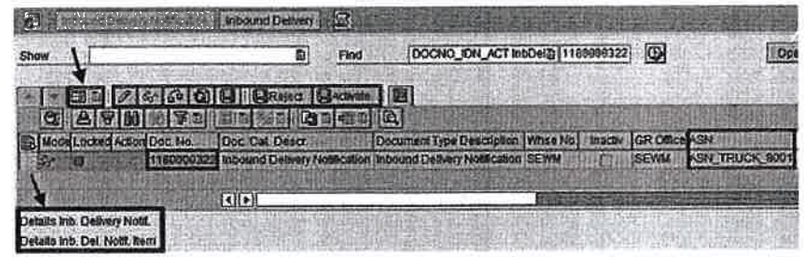
Item Type	Doc. Cat.	Item Cat.	Description	StatuPrf.
IDLV	IDR	DLV	Standard Item - Inbound Delivery	/SCDL/INB_REQ_DLV_STANDARD
IDLV	PDI	DLV	Standard Item - Inbound Delivery	/SCDL/INB_PRD_DLV_STANDARD

14.3.5 Verify IDN

Once the required data is determined from the configuration tables, the system will create an IDN in the system. The IDN can be located in transaction /SCWM/IDN.

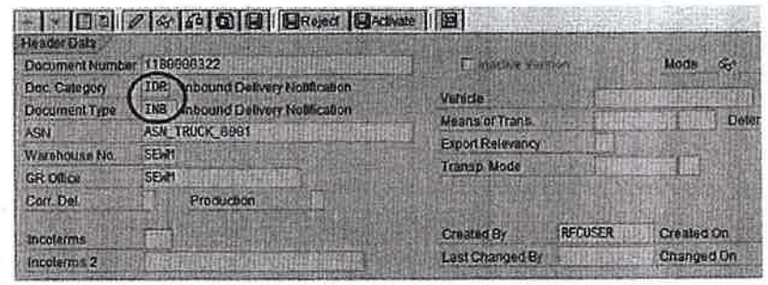
In EWM, the IDN screen is mainly divided into three parts, as shown below. They are as follows:

- IDN header data
- Details of IDN
- Details of IDN Item

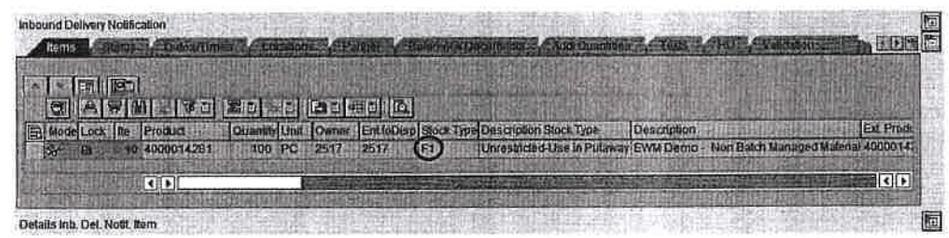


IDN header data can be viewed using a form view or list view. The above screenshot is an example of the list view. This can easily be switched to the form view by selecting the line and clicking on "switch to form view" icon.

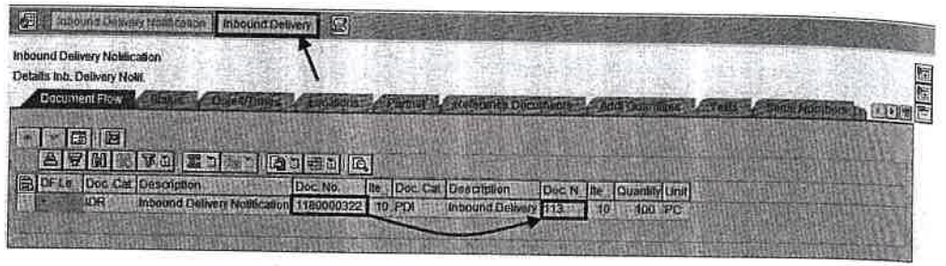
In the form view, verify the document type and document category for the IDN.



In the details section of IDN, verify the quantity, stock type, and item type.



In the details section of IDN item, verify the various other statuses for the line item. It is also possible to navigate to ID by clicking on the inbound delivery button located on application toolbar or via transaction /SCWM/PRDI



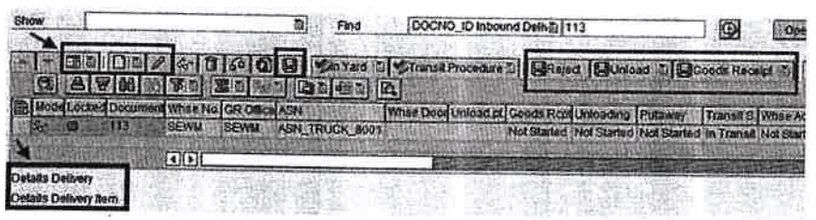
14.3.6 Inbound Delivery (ID) in EWM system

In EWM, PPF is used to create ID from IDN. The standard behavior of the system is that, if the IDN processed successfully and is active, the system will automatically convert the IDN into ID. ID is a very important document in the warehouse. It serves as a basis for product putaway WTs.

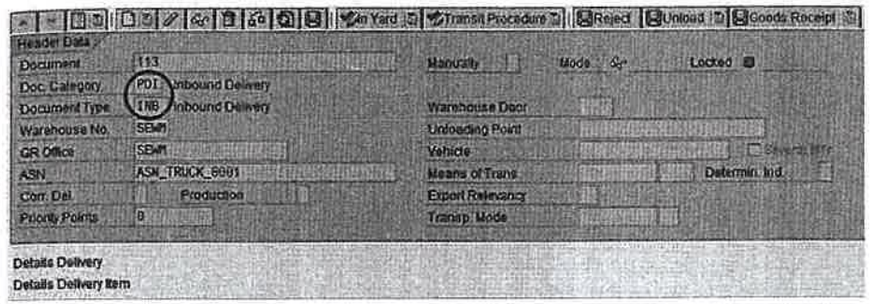
ID is broadly divided into three parts, which are as follows:

- delivery header information
- delivery details
- delivery item details

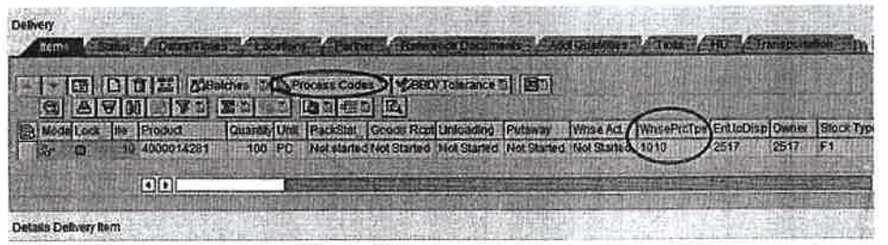
The delivery header contains various controls required to process the ID—for example, change icon, add new item, reject, unload, GRs, and so on. The form view can be used to verify the document type and category of the ID. The ID can be located in transaction /SCWM/PRDI.



The standard document category and document type for ID are PDI and INB.

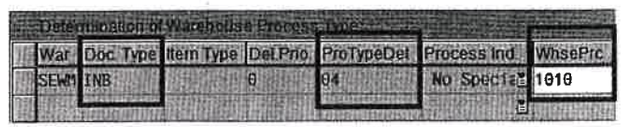


In the delivery details, the process codes are used mainly for delivery split. One of the important pieces of information in the delivery details is WPT, which plays important role in the putaway activity.

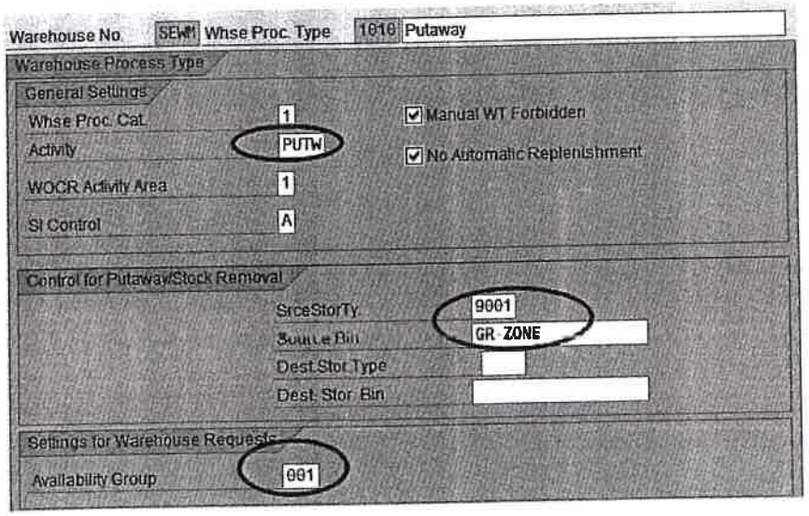


14.3.7 WPT Determination

WPT is needed to create WTs. It is determined based on the information stored in IDN and the warehouse product master. In the above example, WPT 1010 is determined based on warehouse number, document type, and the process type determination indicator. Warehouse number (SEWM) and document type (INB) is derived from IDN, and the process type determination indicator (04) is derived from the warehouse product master.



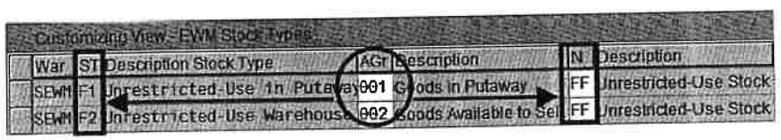
WPT contains various settings required for the next process in the warehouse. In this example, WPT 1010 contains the activity, availability group, source storage type, and source bin, which is passed to the warehouse task document.

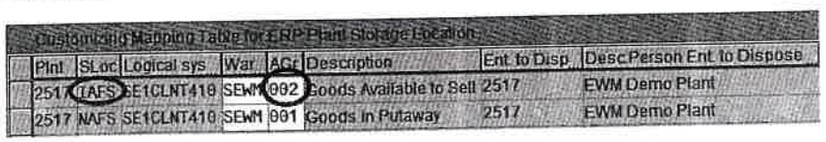


14.3.8 Availability Group

An earlier chapter already covered details of the availability group.

In this example, availability group 001 is mapped to the stock type F1, which means that in the warehouse, it is unrestricted stock in putaway; and in the ERP system, this stock belongs to storage location NAFS (not available for sale). Once the stock is put away in the destination storage type (005), the stock type will change to the availability group of destination storage type. Availability group 002 means in the EWM system, the stock type is mapped to "F2—unrestricted use in the warehouse"—and in the ERP system, the stock will be automatically moved to IAFS (available to sell) storage location. PCN documents will be created and posted for the stock change in both systems.

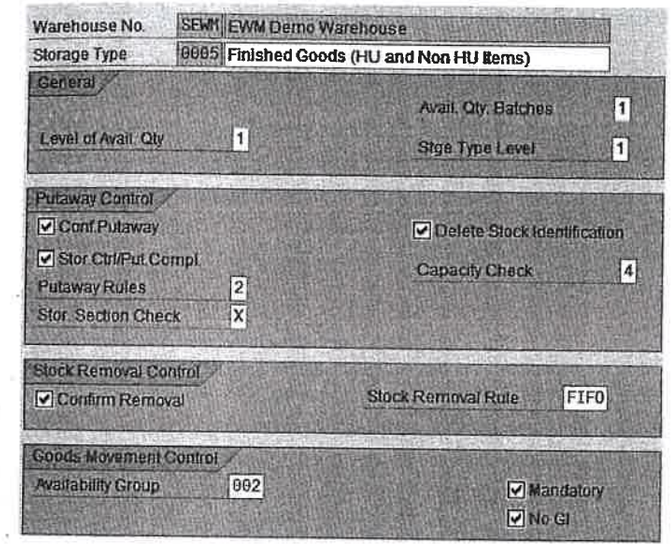




14.3.9 Storage Type and Storage Section Settings

Storage type and storage sections are covered in detail in chapter 5. This section explains the settings required for final and interim storage types and how they influence processing of putaway.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Define Storage Type



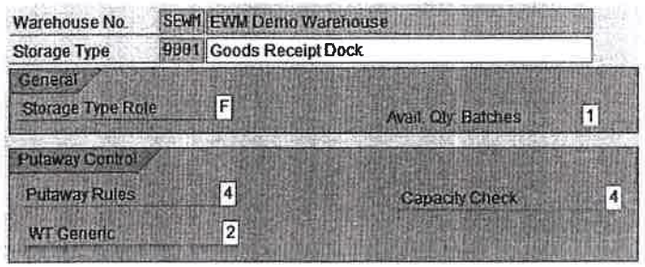
The availability group of the final storage type along with the check in the mandatory check box will control the stock type for the stock that has been put away. If the mandatory check is not active, the availability group will not be considered during putaway confirmation. Only if this checkbox is active will the system create a PCN to move the stock to the destination storage type availability group.

If the confirm putaway indicator is not active, the system will confirm the WT and WO immediately in the background, when the WT is created.

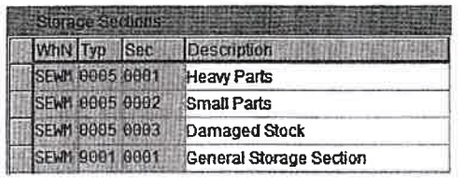
The "Storage.Ctrl/Put.Compl" indicator controls the putaway status in the warehouse request. If this indicator is not set for the final storage type putaway, the status will not be updated in the inbound delivery.

The following screenshot describes the settings required for the interim storage type. For GR, there must be an interim storage type and a bin.

To test our configuration, we have created storage type 9001, storage section 0001, and bin GR-ZONE. The storage type settings for 9001 are shown below.



Storage sections defined for this example are as follows:

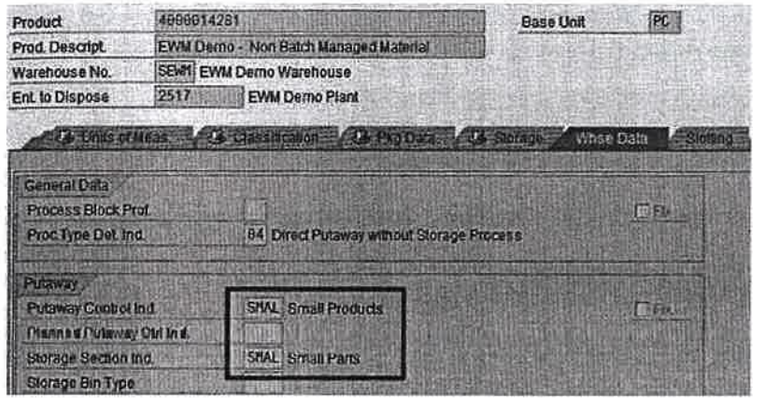


Storage Sections

WhN	Typ	Sec	Description
SEWM	0005	0001	Heavy Parts
SEWM	0005	0002	Small Parts
SEWM	0005	0003	Damaged Stock
SEWM	9001	0001	General Storage Section

14.3.10 Storage Type, Section, and Bin Determination:

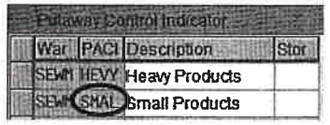
Product master settings play an important role in the storage type, storage section, and storage bin determination process. The Putaway Control Indicator (PACI) from the product master guides the system to search for the appropriate storage types for the product putaway. In this example, PACI has been set to "SMAL – Small Products". The following sections will explain how PACI is configured and influences the storage type search sequence.



14.3.10.1 Define Putaway Control Indicator (PACI)

In EWM, the PACI is defined in menu **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Define Putaway Control Indicator**

Once this indicator is defined, it can be used to determine the appropriate storage type search sequence indicator required for product putaway.

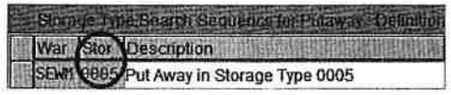


Putaway Control Indicator

War	PACI	Description	Stor
SEWM	HEVY	Heavy Products	
SEWM	SMAL	Small Products	

14.3.10.2 Define and Assign S. Type Search Seq. Ind. for Putaway

The storage type search sequence indicator is used to assign appropriate storage types for the product putaway in a sequence. It is defined under **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Define Storage Type Search Sequence for Putaway**



Storage Type Search Sequence for Putaway: Definition

War	Stor	Description
SEWM	0005	Put Away in Storage Type 0005

Once the indicator is defined, you assign the appropriate storage types and the putaway sequence to it, as shown below.

Menu path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Assign Storage Types to Storage Type Search Sequence

Storage Type Search Sequence for Putaway

WhN	Srch Seq.	Seq	Typ	STG	EV	Description
SEWM	0005	1	0005			Put Away in Storage Type 0005

14.3.10.3 Specify Storage Type Search Sequence for Putaway

This menu is used to assign the storage type search sequence indicator to the combination of PACI and WPT, along with other available indicators.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Specify Storage Type Search Sequence for Putaway

Search Sequence Putaway

WhN	PACI	Proc.	Qty Class.	Sto	Type	Use	Ent.toDisp	H	H	Srch Se	Putaway Rules
SEWM	SMAL	1010								0005	No Putaway Rule

During the WT creation process, WPT gets determined from the warehouse request, and PACI is derived from the product master. These two values, along with other available options, help the system to determine the storage type search sequence indicator, which in turn helps the system determine the appropriate storage types for putaway.

14.3.10.4 Optimize Access Strategy for Storage Type Search

In EWM, various indicators influence the storage type search. To reduce the number of entries, consultants can define an access strategy for the storage type search table. This can improve system performance. Each sequence number is an access combination that the system uses while determining the storage type search. The system will use a more specific search first, broadening to a more generic search as needed.

It is defined in menu path **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Optimize Access Strategy for Storage Type Search: Putaway**

Optimization of Access for Sto.Type Determ. at Putaway

WhN	Seq	Put.Strat.	ProcTyp	Q	Stk	Sto	Use	Pa	Ris	Hzd
SEWM	1	☑	☑	☐	☐	☐	☐	☐	☐	☐

14.3.10.5 Storage Section Search Sequence

Like with storage type search, the system can be set up to determine the appropriate storage sections for putaway. The storage section search starts after determination of destination storage type. The system uses the storage section indicator assigned in the product master to determine the allowed storage sections for product putaway. They are defined in menu path **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Section Search | Create Storage Section Indicators**

Storage Section Indicators

War.	Secin	Description
SEWM	HEVY	Heavy Parts
SEWM	SMAL	Small Parts

Once the storage section indicators are defined, they can be used in the storage section search sequence table to assign the appropriate storage sections and sequence.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Section Search | Maintain Storage Section Search Sequence

Storage Section Search

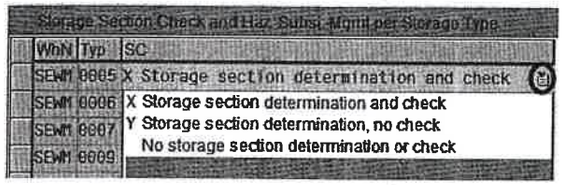
WhN	Typ	HazRat1	HazRat2	Secin	Sequence No.	Sec	EvWhsItem
SEWM	0005			SMAL	1	0002	

Finally, the storage section indicators are assigned to the product master. Once the system identifies the appropriate storage type, the storage section indicator of the product master will be used to determine the appropriate storage sections for product putaway.

14.3.10.6 Storage Section Check

In EWM, storage section search is not mandatory for putaway. This is defined in the storage type under option "storage section check." When the storage section search and storage section check are active, goods are put away only in storage sections that are found in the storage section search.

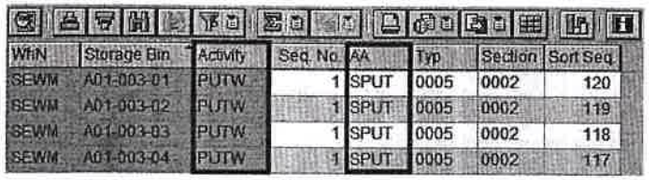
The storage section check can also be defined under **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Section Search | Storage Section Check**



14.3.11 Warehouse Order Creation Rule (WOCR) Determination

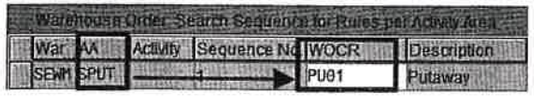
WOCR plays an important role in creating WOs. It can be determined from two sources: if it is specified in the WPT, it will be used to create the WO. If it is not specified here, it will be determined from the activity area of the destination bin, as in this example.

The following screenshot shows the defined activity areas for the destination storage bins (TCode /SCWM/SBST)



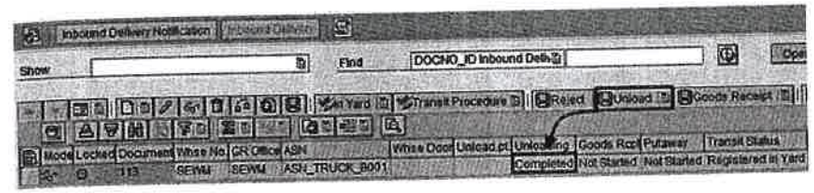
WhN	Storage Bin	Activity	Seq. No.	AA	Typ	Section	Sort Seq.
SEWM	A01-003-01	PUTW	1	SPUT	0005	0002	120
SEWM	A01-003-02	PUTW	1	SPUT	0005	0002	119
SEWM	A01-003-03	PUTW	1	SPUT	0005	0002	118
SEWM	A01-003-04	PUTW	1	SPUT	0005	0002	117

In the configuration, the PU01 WOCR has been assigned to activity area SPUT.



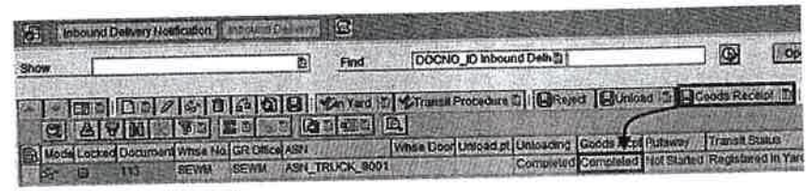
14.3.12 Unloading

In EWM, unloading functionality can be used even without yard management. This action will not update stock in the warehouse or the ERP system. It is only used to update the unloading status in inbound delivery. Unloading can be performed directly in inbound delivery or separately in TCode /SCWM/UNLOAD—Unload.

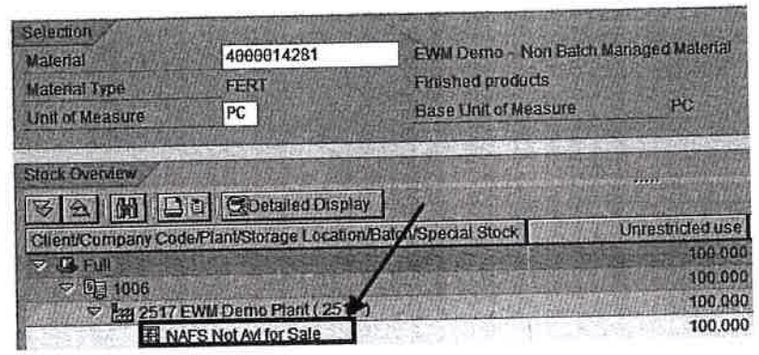


14.3.13 Goods Receipt

As explained earlier, GR can be posted manually in the inbound delivery or automatically when the putaway is confirmed. If the GR is performed manually in the inbound delivery, stock will be updated in the interim storage type (GR area) of the warehouse as well as in the ERP system, and the status of ID will be set to Goods Receipt—Completed.

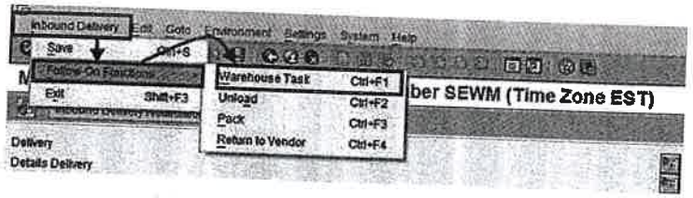


Stock overview in ERP system: Transaction MMBE

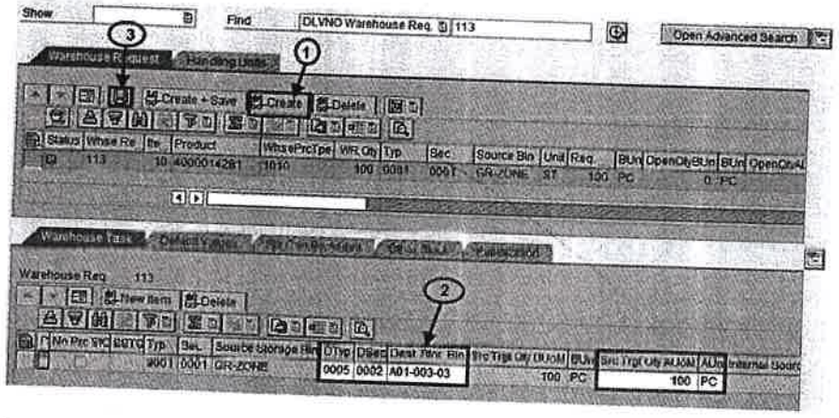


14.3.14 Create Warehouse Task

In EWM, WTs can be created several different ways. One way is by manually creating it from the inbound delivery, as shown below. Here, go to the inbound delivery menu, select "Follow-On Functions," and click on the "Warehouse Task" option. This will bring up the WT creation screen.



In the WT creation screen, select the line item, and click on the "Create" button. This will display the target quantity and destination location details. The system will determine the destination storage type, section, and bin based on settings in the product master. Verify the destination storage bin details and quantity and click "Save." This will create the WT.



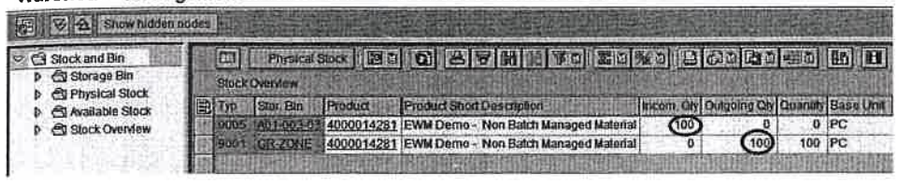
Depending on the WPT settings, the WOCR will be determined, and the WT will be processed in the WOCR to create a WO. At the end of the WT creation process, the system will automatically create a warehouse order.

Warehouse order 3000014 created

Stock Overview in the EWM system: (TCode /SCWM/MON)

Because the putaway is not complete, and the WO is not confirmed, the system will show the outgoing quantity from GR area and the incoming quantity to the destination bin, as shown below.

Warehouse Management Monitor SAP - Warehouse Number SEWM

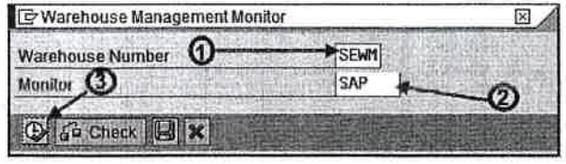


14.3.15 Warehouse Monitor

One of the important tools in the EWM system is the warehouse monitor. This is a central monitoring tool and can be used to display any type of data in the warehouse, for example, warehouse documents, stocks, PI documents, open tasks, open orders, and so on. In addition to displaying data, it can also be used to execute transactions, like confirming warehouse orders and so on.

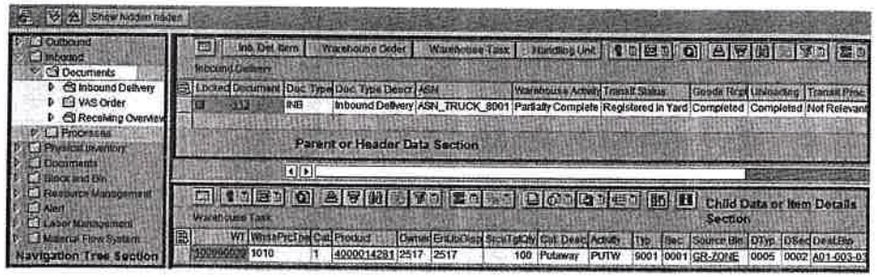
Menu Path: SAP Easy Access | Extended Warehouse Management | Monitoring | Warehouse Management Monitor (TCode /SCWM/MON)

In this transaction, enter warehouse number, enter monitor ID, and click on "Execute." SAP has assigned its monitor ID as "SAP."



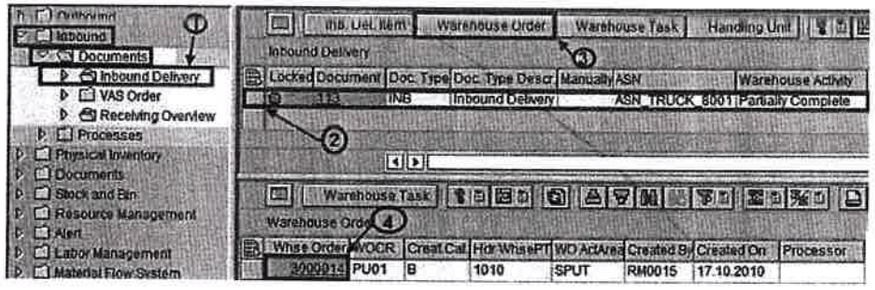
The warehouse monitor display screen is divided into three parts. They are as follows:

- **Navigation Tree Section**: This is located on the left side of the screen and contains all the predefined nodes and their objects—for example, inbound, outbound, stock and bin, document, and so on.
- **Parent Data Section**: The upper portion of the right side of the screen is used to display the header or parent data of the object.
- **Child or Item Details Section**: The child, or item details, section is displayed at the lower portion of the right side of the screen and can be used to display the item details of the parent data.



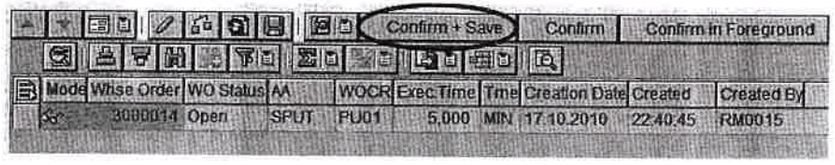
14.3.16 Confirm WT

In order to confirm the WT, the WTs must first be located. The open WT can be found in the warehouse monitor (TCode /SCWM/MON). In the monitor, select inbound, then documents, and double-click on inbound delivery. A window will pop up with the selection fields. Here, enter the inbound delivery number or products. This will display the inbound delivery in the parent data screen. Select the "Inbound Delivery" line item and click on the WO button. This will display the WO in the child data screen.



Click on the WO number. This will open the WO confirmation screen. Select the WO line item and click on the "Confirm + Save" button. This will confirm the WT and update the putaway status in the inbound delivery to be completed.

Alternatively, TCode /SCWM/TO_CONF can also be used to confirm the WT.

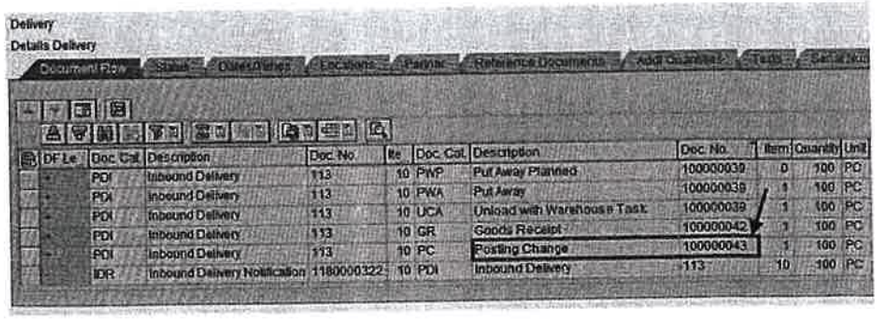


14.3.17 Verify EWM Stock

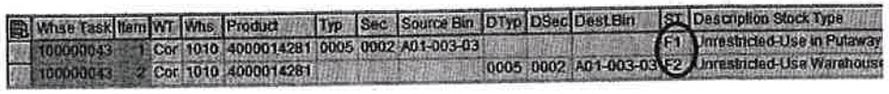
Notice that in the warehouse monitor (TCode /SCWM/MON), the stock is now displayed under the available quantity column, and the stock type is moved from F1 to F2. Change of stock type happened as per the availability group of the storage type. In the background, when the WO was confirmed, a posting change was initiated for the stock type from F1 to F2. In this example, in the ERP system, the stock will be posted to "available to sell" storage location.

14.3.17 Posting Change Document

A WT number created for the posting change is saved in the document flow of inbound delivery, which can be accessed in TCode /SCWM/PRDI under the document flow tab in the delivery item details screen.

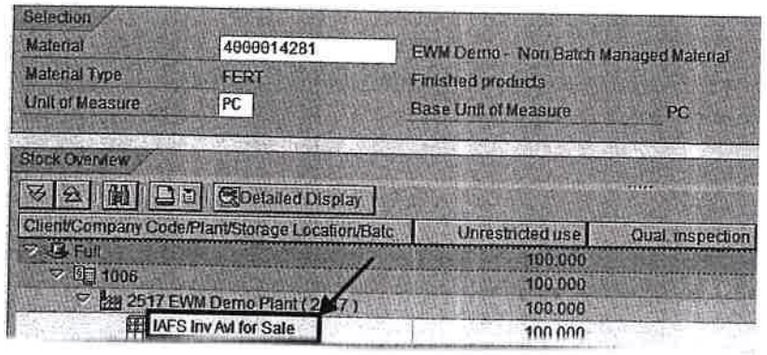


The WT number can be displayed in the warehouse monitor.



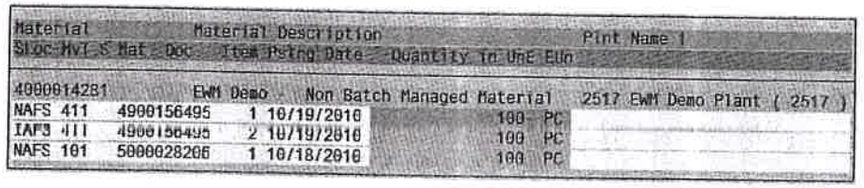
14.3.18 Verify IM Stock In ERP System

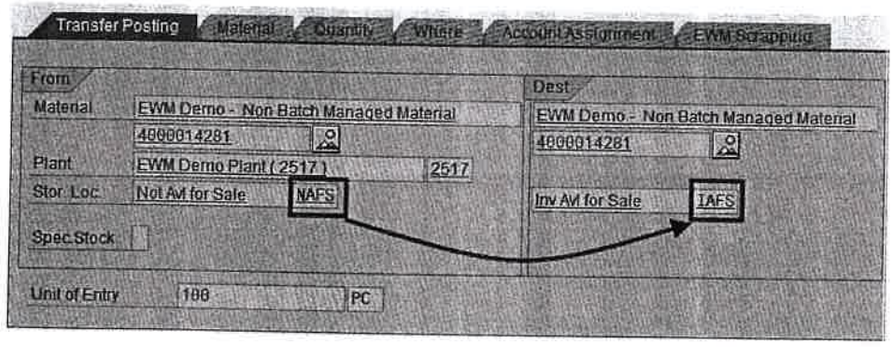
Before confirming the WT the stock was displayed in the "not available to sell" storage location. As shown below, after the confirmation of the WT the stock is automatically moved to "available sell" storage location. Verify the stock in the ERP system in TCode MMBE.



14.3.19 Verify Material Documents in ERP System

In the ERP system, two material documents are created. One is for GR and the other is for warehouse posting change (i.e., stock transfer between storage locations). TCode MB51 can be used to verify the material documents in the ERP system.





Summary

This chapter has explained how to configure direct putaway. This process is used for single-step putaway or simple putaway. To manage multistep putaway in the warehouse, SAP has defined a process called storage control, which is covered in the next chapter.

Chapter 15: Storage Control (SC)

This chapter covers the storage control technique used to determine the process steps required to perform product movements in the warehouse. The goal of storage control is to process complex putaway or stock removals, based on warehouse processes or the physical layout of the warehouse, and provide traceability and stock visibility for each of those process steps.

The storage control processes in EWM are broadly divided into two types. They are:

- Process-Oriented Storage Control (POSC)
- Layout-Oriented Storage Control (LOSC)

POSC can also be combined with LOSC. In this case, EWM always executes the POSC first. The LOSC then verifies whether the sequence of putaway process step is possible in the warehouse layout view. If required, it will adjust the flow of putaway or stock removal.

This section will discuss LOSC and combined LOSC and POSC for warehouse putaway and picking, along with an example of how to use POSC.

15.1 Process-Oriented Storage Control (POSC)

POSC is mainly used in complex warehouses where additional tasks are performed in addition to basic putaway and picking. Example for complex putaway could be unloading, quality inspection, deconsolidation, packing, and putting away the products in the warehouse. Depending on the product processing requirements, it may be required that some products have to go through several steps before the product is actually put away in the bin or shipped to customers. Under POSC, all of these individual storage process steps are combined into one storage process, and the system traces the status of each individual process step.

One of the requirements for the POSC process is that the product should be HU managed. During the GR or GI, as soon as a HU is created or changed, the system copies the predefined process steps from the storage process type to the HU. Also, POSC only supports GR, GI, and internal warehouse processes. It determines the internal routing based on the processes to be carried out within the warehouse before the final putaway or after the stock removal.

Diagram 15.1A is an example for an inbound POSC scenario.

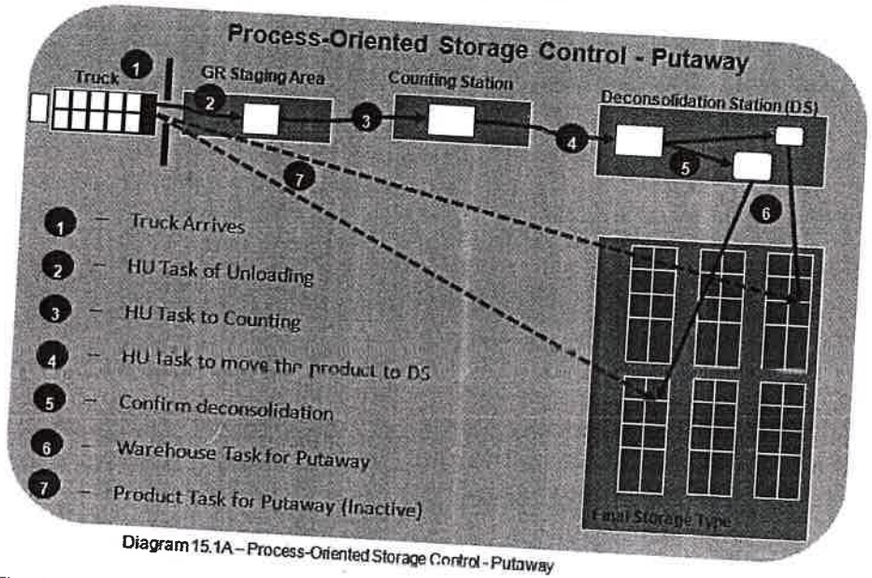


Diagram 15.1A – Process-Oriented Storage Control - Putaway

The following illustration will describe how the system creates multiple tasks and how they are processed in sequence.

1. Truck arrives at the warehouse door.
2. Unloading: When the products are unloaded, the system will create tasks for each process with the status "B—Waiting," other than the HU task for unloading. All waiting tasks will be inactive and can't be processed until the active unloading task is completed. Confirmation of the unloading task will update the HU stock in the GR staging area, and the next task to move the HU to the counting station will be set to active. The WO will be created automatically for the next active WT.
3. Counting: when the active WT is confirmed, the system will update the stock in the counting station and will activate the counting task. When the operator confirms the counting activity, the system will automatically activate the next task to move the HU to the deconsolidation station for product deconsolidation.
4. Confirmation of the WO will update the stock in the deconsolidation work center.
5. Once the HU is deconsolidated, new HUs will be created. The confirmation of a new HU will set the status of the putaway product WT to active.

6. Finally, WOs will be created to putaway the products into the final destination bin. Confirmation of the putaway will update the stock in the final bin.

Diagram 15.1B is an example for the simple POSC picking process.

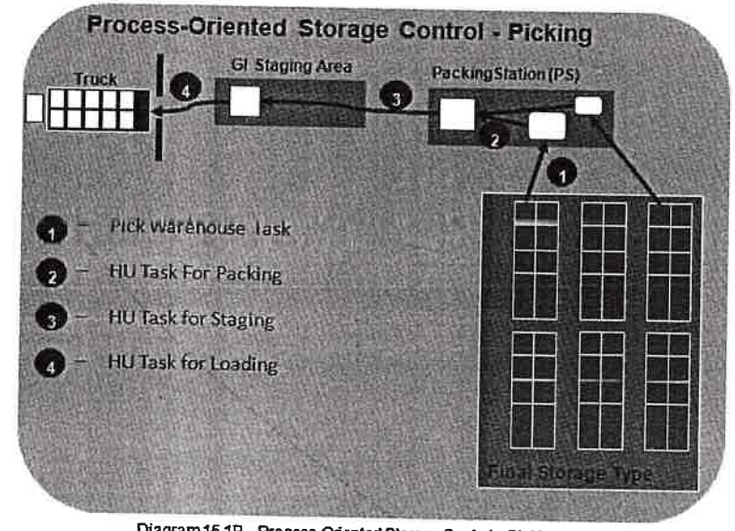


Diagram 15.1B – Process-Oriented Storage Control – Picking

POSC Business Scenario

In order to provide a better understanding of POSC configuration and process flow, we have used a business scenario in which a vendor ships product A and product B as one packed unit. In the truck, they both will arrive as one product. However, in the warehouse, they will be stored as two different products in two different bins. Hence, the product has to be taken to the deconsolidation work center. In the work center products will be segregated and packed into two different products and finally put away in their respective bins.

In order to demonstrate this scenario, three external steps are described below:

- Unloading (IB01): In this step, warehouse personnel will unload the truck.
- Deconsolidation (IB02): Here, warehouse personnel will deconsolidate and repack the products into two different HUs.
- Putaway (IB03): This is the last step. Here, warehouse personnel will putaway the products into the bins.

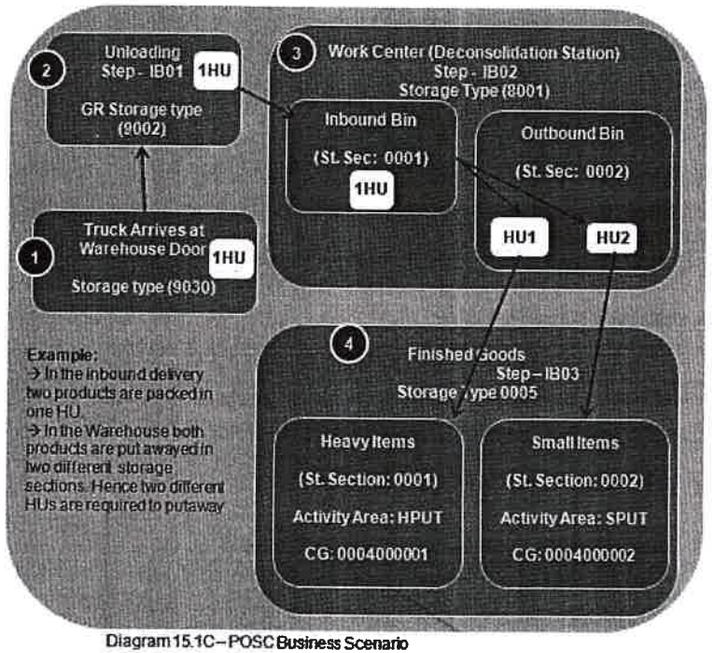


Diagram 15.1C – POSC Business Scenario

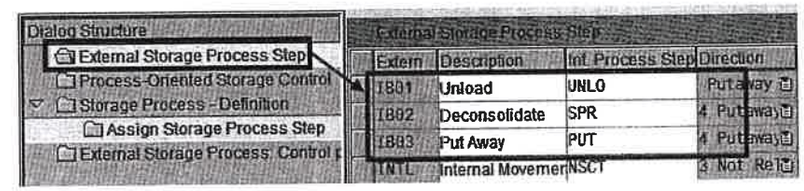
Following sections describe the POSC configuration in step by step.

15.1.1 Storage Process Step

The storage process step is nothing but a warehouse operation or task performed as part of the putaway or removal process. Examples include unloading, deconsolidation, packing, quality inspection, and so on. Under POSC they are defined as external storage process steps.

SAP has predefined several internal steps that describe the standard warehouse operations. These internal process steps are not modifiable. When the external process steps are defined, they must be assigned to the internal process steps.

To define the external storage process steps, follow menu path **SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Process-Oriented Storage Control**

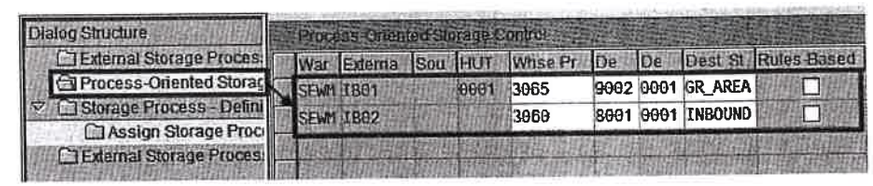


As per the business scenario, three external process steps (IB01, IB02, and IB03) have been defined and assigned to the appropriate internal process steps.

15.1.2 Process-Oriented Storage Control

Under the POSC option, maintain the required data like WPT, destination storage bin, source and destination storage types, for intermediate external process steps.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Process-Oriented Storage Control



The destination bin for the last step (IB03) will be determined as per product master. Hence, it is not defined here.

- **Source storage type** enables users to control whether the HU should be moved via this intermediate storage type.
- **HU type group**: This is determined from the HU type of the material that is used for packaging. This assignment can be used to always specify that a particular HU type should be always moved via this intermediate storage type.
- **WPT:** This is required to create the WT for the external step.
- **Destination details**: This specifies a destination storage type, destination section, and destination bin for the intermediate external steps that will be used in the WT. Rule-based determination can also be used to determine the destination storage bin details. In this case, the system will use search sequences to determine the bins. If the system should search for the intermediate storage type, section, or bin using specific rules, set the "Rules-Based" indicator.

15.1.3 Storage Process—Definition

Third important step under POSC is defining storage process. Storage process contains the external process steps in a sequential order. For technical reasons, it is always necessary to maintain the process steps in the following sequential order. For putaway, it should always be

- Unload
- Count
- Deconsolidate
- Quality Inspection
- Perform Value Added Services
- Putaway

Some of the above steps may be optional, but putaway should always be the last step in the sequence.

For, the process steps must be defined in the following sequence:

- Remove from Stock (Pick)
- Perform Value Added Services
- Pack
- Stage
- Load

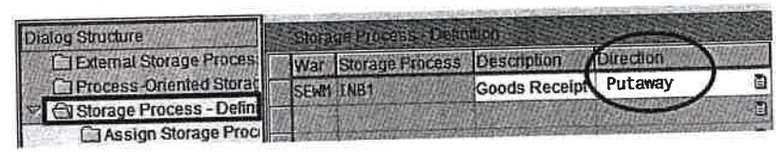
Some of the above steps may be optional, but picking should always be the first step in the storage process for removal.

For internal movements, the internal storage process steps are allowed in the following sequence:

- Remove from Stock
- Pack
- Deconsolidate
- Putaway

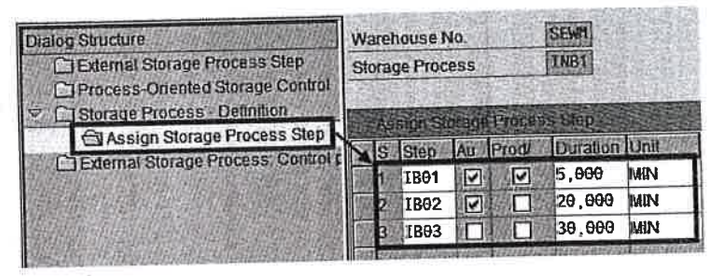
If there is stock to be removed, that should be the first step. If there is putaway, that should be the last step.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Process-Oriented Storage Control



Here "Storage Process" INB1 is defined for Putaway. In the "Assign Storage Process Step" option, all the external storage process steps are assigned to the storage process (INB1) in appropriate sequence.

Duration can also be maintained for each of these steps in "Duration" field. The "Auto WT" check box will determine whether the WT will be created automatically. If the check box is not checked, the WT has to be created manually.

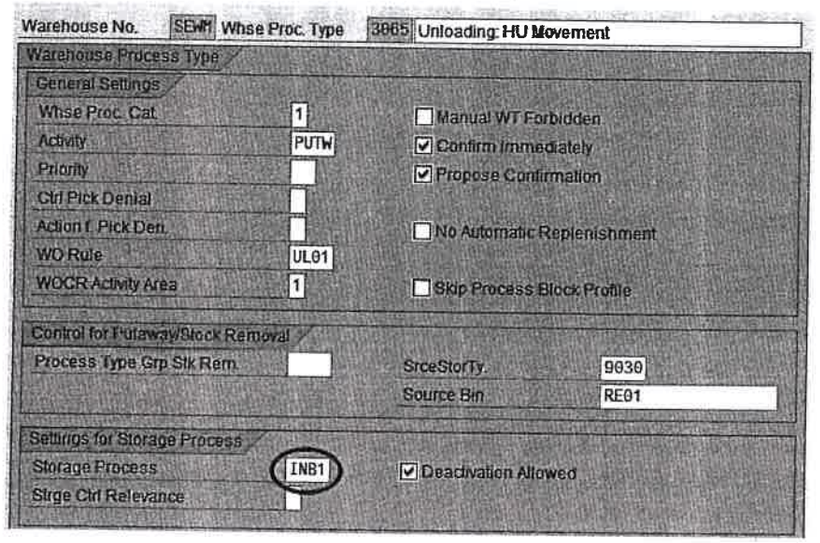


15.1.4 Assign Storage Process to WPT

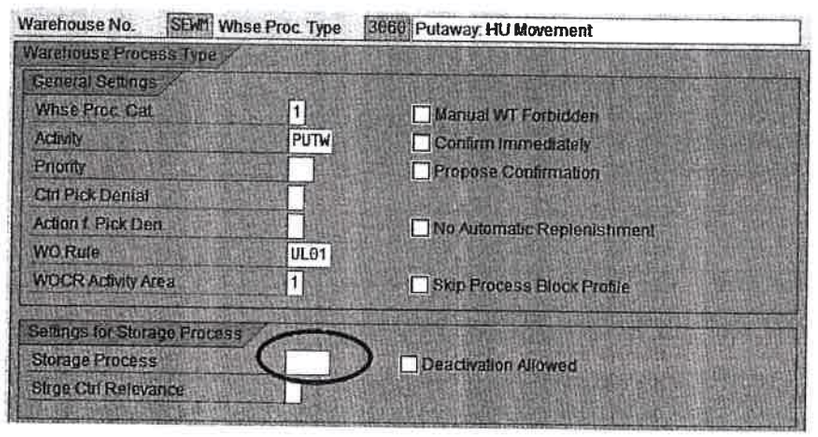
Next step in case of "Inbound Process" is assigning the storage process to the WPT. For "Outbound Processing (Removal)," the storage process is assigned to the WOCR used to create WO for picking. Assignment of storage process to WPT can be done in the following menu path.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Warehouse Process Type

In the above example, because the IB01 is the first external step in INB1 and IB01 is assigned to WPT 3065, Storage Process Step INB1 must be assigned to WPT 3065. During WT creation, if WPT "3065" gets determined and the stock is HU managed, system will automatically trigger INB1 storage process. This will create one or more WTs for every step and the WT for first external step IB01 will be set to active.



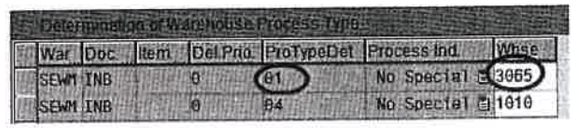
The following screenshot shows the settings for WPT 3060. Because WPT 3065 triggers before WPT 3060, INB1 must be assigned to the WPT 3065.



15.1.5 WPT Determination

WPT always gets determined based on delivery document type, delivery item type, delivery priority, and process type indicator. Values for delivery document type, delivery items type, and delivery priority come from the source document. The process type indicator is derived from the product master.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Warehouse Process Type

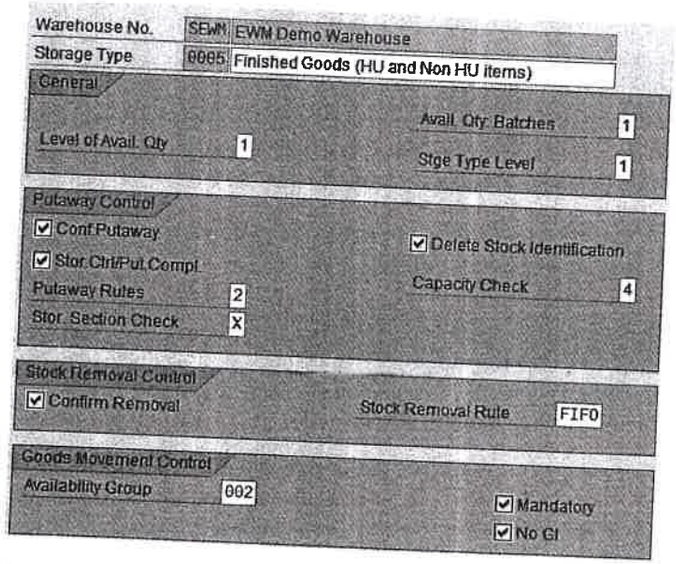


15.1.6 Storage Type and Storage Section Settings

Storage type and storage sections are covered in detail in the chapter 5. The following screenshots will show you how the storage types and storage sections are defined in the system for the above mentioned POSC business scenario. These setting might change depending on your business requirements.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Define Storage Type

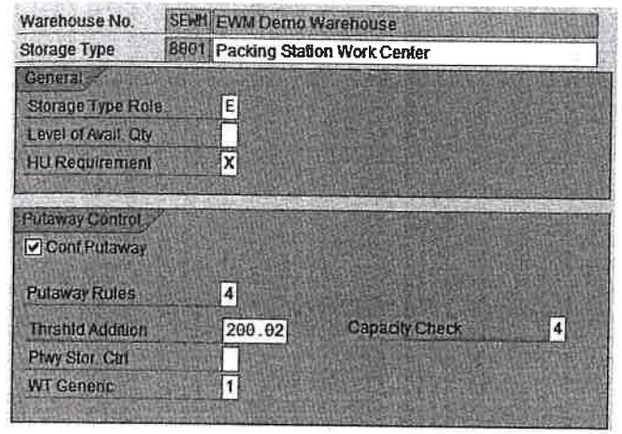
The availability group of the final storage type along with the mandatory check will control the stock type for putaway. If the "Mandatory" check box is not active, the availability group will not be considered during putaway confirmation. Only if this check box is active will the system create a PCN to move the stock to the destination storage type availability group.



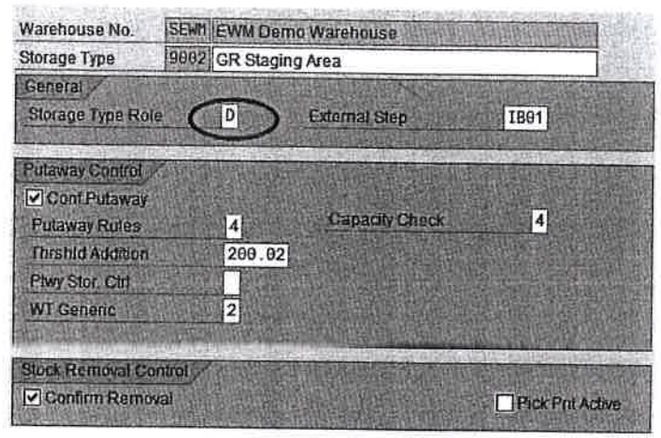
If the "Confirm Putaway" indicator is not active, the system will confirm the WT and WO in the background as soon as the WT is created.

The "Storage.Ctrl/Put.Compl" indicator controls the putaway status in the warehouse request. If this indicator is not set for final storage type, the putaway status will not be updated in the inbound delivery. For POSC, this has to be checked for the final storage types.

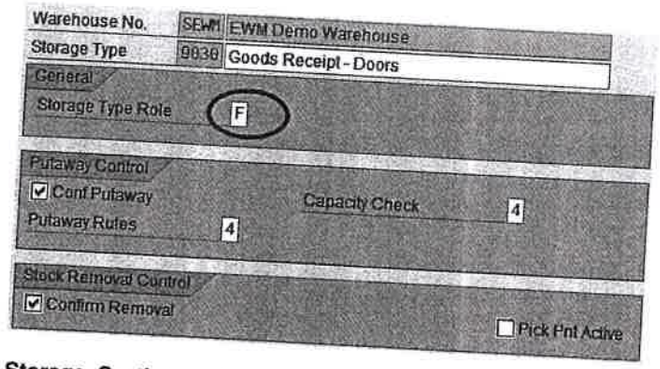
The following screenshot shows the settings done for work center (8001) storage type. In EWM, work center is a type of storage type, with storage type role "E—Work Center". In the storage type, set the HU requirement as X.



The following screenshot shows the settings done for GR staging area (9002). The storage type role defined for GR area is D—Staging area. Here also, the first external step has been assigned to this storage type.



In EWM doors are also defined as a storage type. The next screenshot displays the settings done for GR doors (9030). An important parameter here is storage type role, which must be F for doors.



Storage Sections: Storage sections are covered in detail in chapter 5. The storage sections displayed here, created for each storage type. are only for reference and to facilitate understanding.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Define Storage Section

Storage Sections

WhN	Typ	Sec	Description
SEWM	0005	0001	Heavy Parts
SEWM	0005	0002	Small Parts
SEWM	0005	0003	Damaged Stock
SEWM	0001	0001	Unpacked Goods
SEWM	0001	0002	Packed Goods
SEWM	0002	0001	General Staging Area 1
SEWM	0002	0002	General Staging Area 2
SEWM	9030	0001	Doors

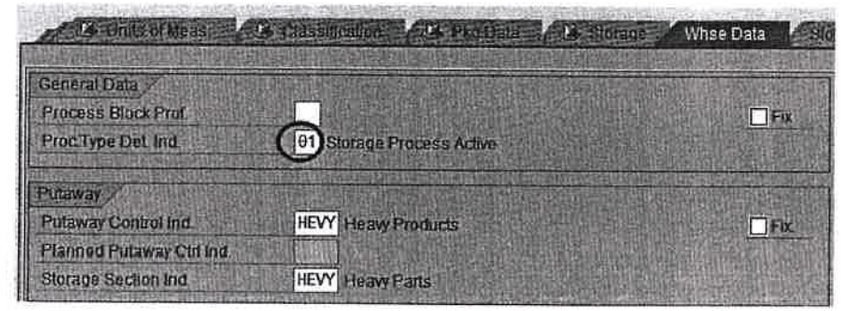
15.1.7 Product Master data

For the above described POSC business scenario we have defined following two finished goods products (4000014282 and 4000014283) and one packaging product (5000005181).

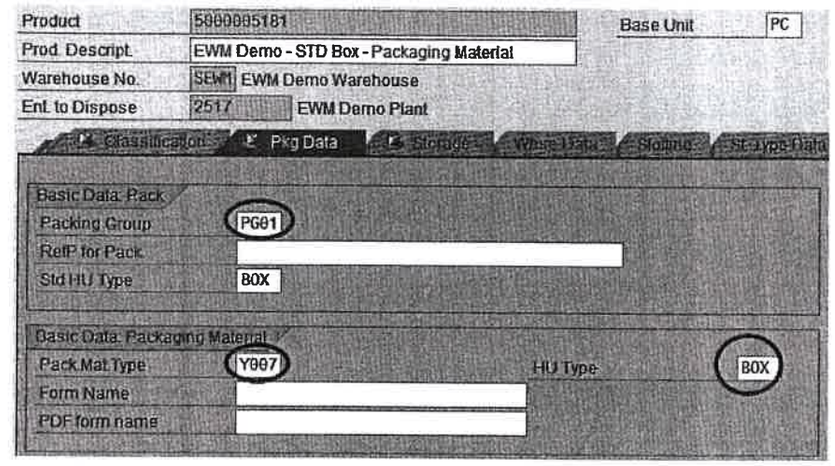
	Whse Data Tab			Pkg Data Tab			
Prod. Number	Proc. Type Det. Ind.	Put. Ctrl. Ind.	St. Sect. Ind	Packing Group	Std HU Type	Pack Mat Type	HU Type
4000014282	01	HEVY	HEVY				
4000014283	01	SMAL	SMAL				
5000005181				PG01	BOX	Y007	BOX

In TCode /SCWM/MAT1, for finished products, assign the appropriate process type determination indicator, putaway control indicator (PACI), and storage section indicator (SSI) in "Warehouse Data

Tab." In this example, PACI and SSI "HEVY" is assigned to product 40000014282 and "SMAL" is assigned to 40000014283.



In order to create HUs, packaging products should also be created for the warehouse, but only the "Pkg Data" tab needs to be maintained. In this example product 5000005181 is defined as packaging product.



15.1.8 Storage Type, Section, and Bin Determination

Product master settings play an important role in the determination of storage type, storage section, and storage bins. These details have already been covered in earlier chapters. Here, only an overview of the required configuration settings will be covered.

15.1.8.1 Define Putaway Control Indicator (PACI)

Two indicators have been defined to differentiate the small products from the heavy products storage.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Define Putaway Control Indicator

Putaway Control Indicator

War	PACI	Description	Stor
SEWM	HEVY	Heavy Products	
SEWM	SMAL	Small Products	

15.1.8.2 Define and Assign Storage Type Search Sequence for Putaway

The storage type search sequence indicator is used to assign appropriate storage types for the product putaway in a sequence. It is defined under **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Define Storage Type Search Sequence for Putaway**

Storage Type Search Sequence for Putaway - Definition

War	Stor	Description
SEWM	0005	Put Away in Storage Type 0005

Once the indicator is defined, the appropriate storage types and putaway sequence are assigned to it, as shown below. Multiple storage types can be assigned to the storage type search sequence.

Menu path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Assign Storage Types to Storage Type Search Sequence

Storage Type Search Sequence for Putaway

WhN	Srch Seq.	Seq	Typ	STG	Evl	Description
SEWM	0005	1	0005			Put Away in Storage Type 0005

15.1.8.3 Specify Storage Type Search Sequence for Putaway

This menu is used to assign the storage type search sequence indicator to the combination of PACI and warehouse process type, along with other available indicators. Based on this storage type search sequence is determined for putaway.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Specify Storage Type Search Sequence for Putaway

Search Sequence Putaway

WhN	PACI	Proc.	Qty Class	Sto.	Type	Use	Ent.toDisp	Haz.	H.	Srch Seq.	Putaway Rules
SEWM	HEVY	3065								0005	No Putaway Rule
SEWM	SMAL	3065								0005	No Putaway Rule

Here, both PACIs have been assigned to the same the search sequence. This way, both products will be stored in the same storage type, but in two different storage sections.

15.1.8.4 Optimize Access Strategy for Storage Type Search: Putaway

In EWM, various indicators influence the storage type search. To reduce the number of entries, an access strategy can be defined for the storage type search table. This can improve system performance. Each sequence number is an access combination that the system uses while determining the storage type search. The system will first use a more specific search, and then broaden to a more generic search.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Optimize Access Strategy for Storage Type Search: Putaway

Optimization of Access for Stor.Type Determ. at Putaway

WhN	Seq	Put Strat	ProcTyp	Q	Stk	Sto	Use	Pa	Rds	Hzd
SEWM	1	☑	☑	☐	☐	☐	☐	☐	☐	☐

15.1.8.5 Storage Section Search Sequence

Like with storage type search, the system can be defined to determine the appropriate storage sections for putaway. The storage section search starts after determination of destination storage type. The system uses the storage section indicator assigned in the product master to determine the allowed storage sections for product putaway. They are defined in menu path **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Section Search | Create Storage Section Indicators**

Storage Section Indicators

War	Secin	Description
SEWM	HEVY	Heavy Parts
SEWM	SMAL	Small Parts

Once the storage section indicators are defined, they can be used in the storage section search sequence table to assign the appropriate storage sections and the sequence.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Section Search | Maintain Storage Section Search Sequence

Storage Section Search

WhN	Typ	H.	H	Secln	Seq	Sec	EvWh
SEWM	0005			HEVY	1	0001	
SEWM	0005			SMAL	1	0002	

Here, notice the assignment of storage section indicators to the storage sections. In the product master, the storage section indicator "HEVY" has been assigned to product 4000014282 and "SMAL" to product 4000014283. In this configuration, "HEVY" has been assigned to storage section "0001—Heavy Parts," and "SMAL" to storage section "0002—Small Parts." This way, these two products will be stored in two different storage sections under storage type 0005.

15.1.8.6 Storage Section Check

In EWM, storage section search is not mandatory for putaway. This is defined in the storage type under option "Storage Section Check." During the storage section search if the storage section check is active, goods are putaway only in storage sections found as per the product master.

The storage section check can also be defined under **SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Section Search | Storage Section Check**

Storage Section Check and Haz. Subst. Mgmt per Storage Type

WhN	Typ	SC
SEWM	0005	X Storage section determination and check
SEWM	0006	X Storage section determination and check
SEWM	0007	Y Storage section determination, no check
SEWM	0009	No storage section determination or check

15.1.9 Staging Areas

Configuration of staging areas is covered in detail in chapter 5 under section 5.2.14. Please refer to this section for screenshots and for more details.

15.1.10 Work Center

Configuration of the work center is also covered in detail in chapter 5 under section 5.2.15. If a process step is performed at a work center, the system should also determine the work center where this step is to be performed. Therefore, it is important to assign the work center–related process step to the work center in the "Define Work Center" screen, as show below.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Work Center | Define Work Center.

Define Work Center

War	Work Cntr	Description	Step	Stor	iSec	oSec	R	Layout	RF	HU	Print	Proces
SEWM	VERP	Packaging Work Cente	TB02	0001	0001	0002		VPMX	☑			

15.1.11 WOCR

Configuration of WOCR is covered in detail in chapter 12. This business scenario has used the standard SAP-delivered WOCR called "UL01—Unload." It is defined with the creation category "Load/Unload" and assigned to WPTs 3065 and 3060.

Warehouse No. SEWM
WO Creatn Rule UL01

Warehouse Order Creation Rule

Description	Unload
Creation Cat	F Load/Unload
Item Filter	

15.1.12 Determination of Consolidation Group

Consolidation group plays an important role in POSC. One of the ways the system determines that deconsolidation is required is based on different consolidation group from the putaway location. The system first determines the PACI, which helps to determine the storage type, storage section, and the bin location. The bin location information is used to determine the activity area. Activity areas contain the consolidation group.

At the time of putaway, if the HU contains multiple products, and they belong to different consolidation group, the system sends that HU to a work center for the deconsolidation process. Diagram 15.1.12A shows how the consolidation group is determined for the putaway activity.

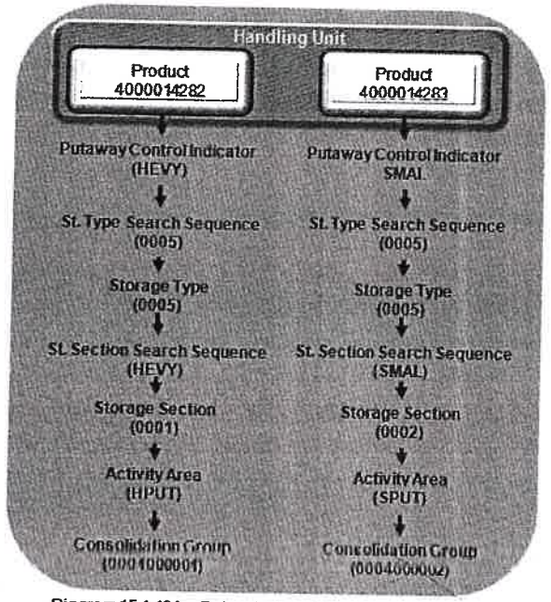


Diagram 15.1.12A – Determination of Consolidation Group

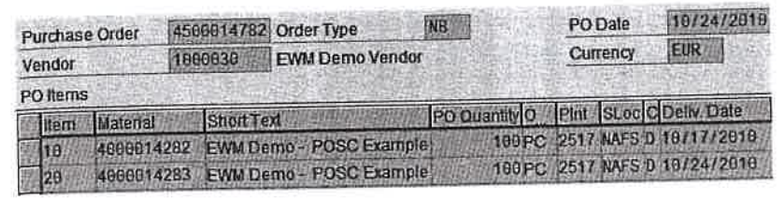
15.1.13 Exercise—POSC Scenario

In order to test the above explained POSC business scenario, the following data has been used:

a) Finished Materials—4000014282 and 4000014283
b) Packaging Material—5000005181
c) Vendor—1000030
d) Plant—2517, Storage Locations—NAFS and IAFS

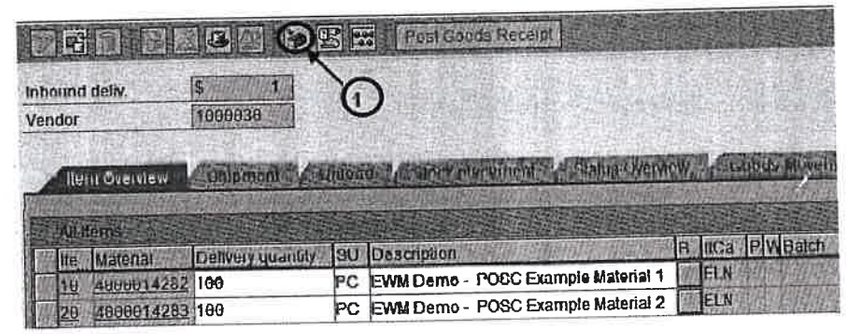
15.1.13.1 Create Purchase Order in the ERP System

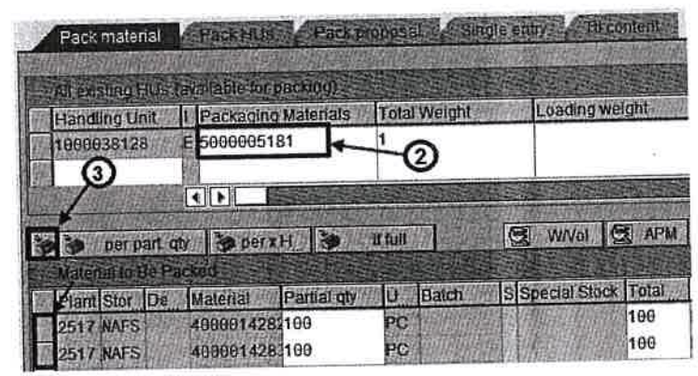
Create one purchase order (TCode ME21N) for two materials and select the appropriate confirmation key to create an inbound delivery.



15.1.13.2 Create an Inbound Delivery in ERP System

In order to test POSC, create an inbound delivery (TCode VL31N) with reference to the purchase order and pack both materials into one HU. To pack products in the inbound delivery, use the "Pack" button located on the application toolbar. Upon saving, verify that inbound delivery is transferred to the EWM system.





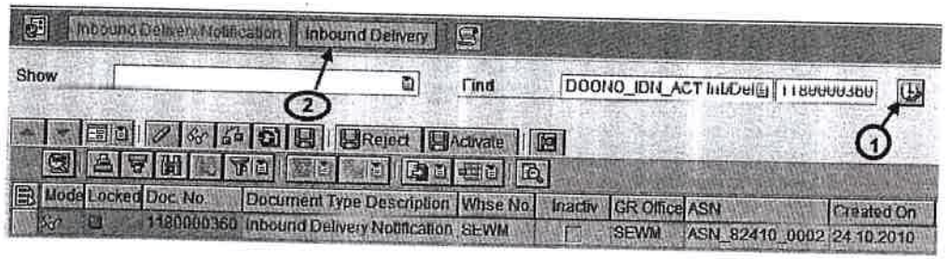
Select the materials to be packed and click on "Pack" button (step 3).

Once all the products are packed, click on "Save" button to create a delivery.

Inbound Delivery 1180000360 was saved and distributed to the WMS

15.1.13.3 Locate ID In the EWM System

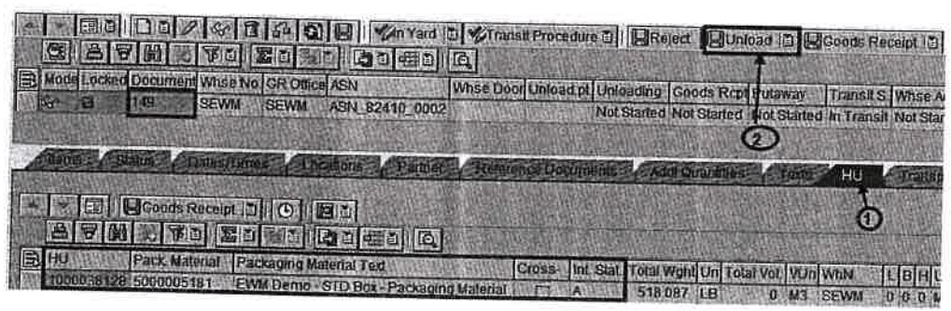
In TCode /SCWM/IDN, in the "Find" field, select the option "Inbound Delivery Notification," enter the ERP inbound delivery number in the text box, and click "Execute". Verify that IDN is active. If not, correct the IDN and click the "Activate" button.



Click the "Inbound Delivery" button on the application toolbar. This will display the inbound delivery document created for the IDN.

In the ID screen, click the HU tab and verify that HU details are transferred to the EWM system. Verify the WPT, item category, stock type, and goods movement bin, if necessary.

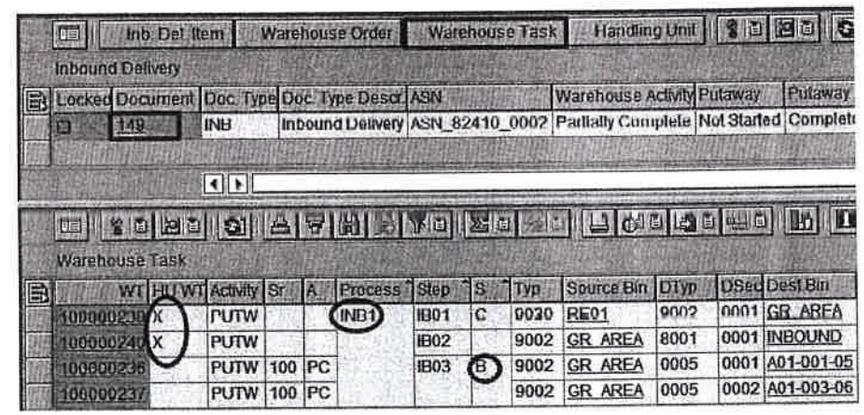
Click the "Unload" button to unload the HU from the truck. This will create the multiple WTs for the delivery, which can be seen in the warehouse monitor.



15.1.13.4 Display Warehouse Task

In the warehouse monitor (TCode /SCWM/MON), select the ID and click on the "Warehouse Task" button. This will display all WTs created for the inbound delivery. Notice the status "B—Waiting" for final putaway WTs. This means the system is waiting for the previous steps to confirm before the activating the final steps.

In this example, the system has created two HU tasks, the first for step IB01 to unload the HU from door 9030 to GR staging area (9002) and the second for step IB02 to move the HU from GR staging area to the work center (8001). The system also created two inactive tasks (one for each product with status B) to putaway the products in the warehouse. Notice the status "C—Completed" for the unloading HU task. This means the WO is created and confirmed for this task automatically.



Notice the status "blank" for the HU task, which is created to move the HU from the GR area to the work center (8001). This means the WO has been created, and currently this task is active in the system.

15.1.13.5 Display WOs

In the warehouse monitor (TCode /SCWM/MON), select the ID number and click the "Warehouse Order" button to display all the WOs for the ID. As explained above, two WOs are created. One is confirmed, and the second one is open or active. The active WO has the status left blank.

Warehouse Order

Whse Order	WOCR	Creat.Cat	Hdr.WhsePT	Status	WO ActArea	Q	Wave	Created By	Created On
3000154	UL01	F	3060					RM0015	24.10.2010
3000153	UL01	F	3065	C				RM0015	24.10.2010

The following screenshot shows a stock overview before moving the HU to the work center. The HU and stock will show on the work center monitor only after confirming the WO.

Stock Overview

Typ	Stor. Bin	Product	Batch	ST	Incom. Qty	Outg. Qty	AvlQtyBUoM	Quantity	BUn
0005	A01-001-05	4000014282		F1	100	0	0	0	PC
0005	A01-003-06	4000014283		F1	100	0	0	0	PC
9002	GR_AREA	4000014282		F1	0	100	0	100	PC
9002	GR_AREA	4000014283		F1	0	100	0	100	PC

Click on the open WO number and click on confirm and save button. This will move the HU stock from the GR area to the work center storage type.

Check the status of the WTs and the warehouse orders. The status of the final putaway WTs will remain "B" until the work center deconsolidates and confirms the new HUs. Notice that the system has now updated the source bin for final putaway as work center bin.

Warehouse Task

WT	HU WT	Activity	SrcTotQty	AUn	Process	Step	Status	Typ	Sec	Source Bin	DTyp	DSec	Dest Bin
100000239	X	PUTW			INR1	IB01	C	9030		RE01	9002	0001	GR_AREA
100000240	X	PUTW				IB02		9002	0001	GR_AREA	8001	0001	INBOUND
100000236		PUTW	100	PC		IB03	B	8001	0001	INBOUND	0005	0001	A01-001-05
100000237		PUTW	100	PC				8001	0001	INBOUND	0005	0002	A01-003-06

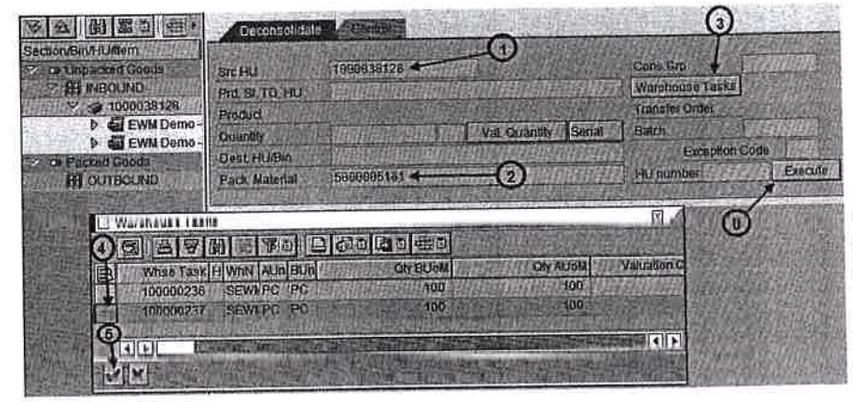
In the stock overview, the stock is now visible in the work center location in the inbound section.

Stock Overview

Typ	Stor. Bin	Product	Batch	ST	Incom. Qty	Outg. Qty	AvlQtyBUoM	Quantity	BUn
0005	A01-001-05	4000014282		F1	100	0	0	0	PC
0005	A01-003-06	4000014283		F1	100	0	0	0	PC
8001	INBOUND	4000014282		F1	0	100	0	100	PC
8001	INBOUND	4000014283		F1	0	100	0	100	PC

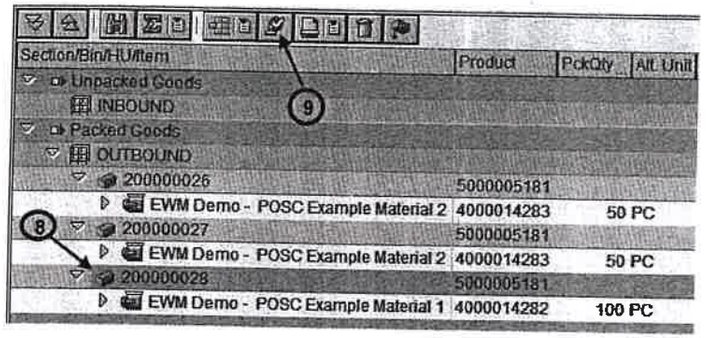
15.1.13.6 Deconsolidation Process

Go to TCode /SCWM/DCONS, enter the warehouse number and work center and click "Execute." The HU should be displayed with the product details in the work center monitor under "Section / Bin / HU/ Item" section.



In the "Deconsolidate" tab, enter the HU number in the "Src HU" field, enter the packaging material, and click the WT button. This will display all the WTs assigned to the product. Once the actual deconsolidation task is completed and the product is packed into a new HU, select the appropriate WT and hit "Enter." During this process the quantity can be adjusted, if required. Finally, click the "Execute" button to create a new HU.

Based on the work center configuration, the new HU might remain in the same bin or move to the bin specified in the configuration. In this example, new HUs move to the outbound section. Repeat these steps for the remaining tasks or open packing activities. It is possible to leave partial stock in the parent HU or create new HUs for all stock. In this example, three new HUs were created from one parent HU, as shown below in the screen shot.



In order to complete the work center process, select the HUs created and click on the "complete process step for HU" button (step 9). This will activate the final putaway WTs and create the warehouse orders to move the products from the work center outbound section to the final destination bins.

For each newly created HU, the system will create a new WT. In this case, there are three open HU WTs with the status blank, with the updated source bin information.

Warehouse Task

WT	HU WT	Activity	Srce	AUn	Proce	Step	Status	Typ	Sec	Source Bin	DTyp	DSec	Dest.Bin
100000238	X	PUTW			INB1	IB01	C	9030		RE01	9002	0001	GR_AREA
100000240	X	PUTW				IB02		9002	0001	GR_AREA	8001	0001	INBOUND
100000236		PUTW	100	PC		IB03		8001	0002	OUTBOUND	0005	0001	A01-001-05
100000237		PUTW	50	PC				8001	0002	OUTBOUND	0005	0002	A01-003-06
100000241		PUTW	50	PC				8001	0002	OUTBOUND	0005	0002	A01-003-06
100000236		PUTW	100	PC			C	8001	0001	INBOUND	8001	0002	OUTBOUND
100000237		PUTW	50	PC				8001		INBOUND	8001	0002	OUTBOUND
100000237		PUTW	50	PC				8001	0001	INBOUND	8001	0002	OUTBOUND

15.1.13.7 Confirm Putaway WTs

WTs can be confirmed from the warehouse monitor (TCode /SCWM/MON) or, alternatively, using TCode /SCWM/TO_CONF. In the warehouse monitor, click on the WO and click the "Confirm Save" button. This will confirm the WTs and update the stock in the destination bins.

Warehouse Order

Whse Order	Status	WO Act/Area	Created By	Created On	Created At	Q	Wave
3000158		SPUT	RM0015	24.10.2010	06:47:09		
3000159		SPUT	RM0015	24.10.2010	05:18:26		
3000160		HPUT	RM0015	24.10.2010	05:18:26		
3000153	C		RM0015	24.10.2010	05:18:26		
3000154			RM0015	24.10.2010	05:18:29		
3000155		SPUT	RM0015	24.10.2010	05:18:26		
3000156		SPUT	RM0015	24.10.2010	05:18:26		
3000157		HPUT	RM0015	24.10.2010	05:18:26		

15.1.13.8 Verify Warehouse Stock

If the HUs are allowed in storage type, they will show up in the stock under physical stock options. You can verify the stock in the warehouse monitor (TCode /SCWM/MON).

Physical Stock

Typ	Stor. Bin	HU	Product	Product Short Description	Quantity	BUn
0005	A01-001-05	200000028	4000014282	EWM Demo - POSC Example Material 1	100	PC
0005	A01-003-06	200000026	4000014283	EWM Demo - POSC Example Material 2	50	PC
0005	A01-003-06	200000027	4000014283	EWM Demo - POSC Example Material 2	50	PC

15.2 Layout-Oriented Storage Control (LOSC)

LOSC determines the internal routing based on the layout within the warehouse (intermediate locations). POSC is focused on the movement of the products, whereas LOSC is used to make sure that the products are moving accurately as per the physical layout of the warehouse.

LOSC is typically used in warehouses where the product cannot be moved to the destination bin directly due to the physical layout restrictions of the warehouse. For example, products stored in the mezzanine floor are received in the ground floor. In order to store the products in the mezzanine floor, they have to be transferred via elevator point. In such scenarios, LOSC is the better fit, as it creates tasks to move products from one location to another and provides product visibility in each of these areas. In the following sections, the LOSC configuration will be explained with this as an example.

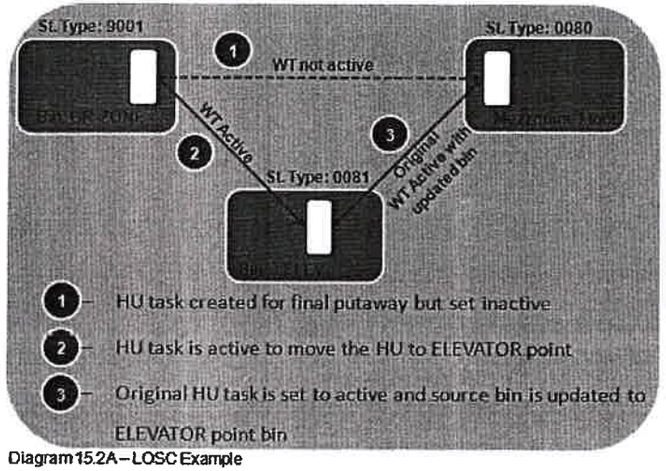


Diagram 15.2A – LOSC Example

Like POSC, LOSC works only with HUs. (The only exception is the process with ID points or picks points.)

LOSC Business Scenario

The business scenario is, products are packed in HUs in the ERP inbound delivery. In the warehouse, they have to be stored in the mezzanine/upper-level floor. The route followed in the warehouse to move the product to the upper level is via elevator point.

15.2.1 Configuration Requirement

By now, most of the basic configurations required to putaway the stock in the warehouse have been explained in detail both in chapter 14 and in this chapter under POSC section of this chapter. Hence, it will not be explained in detail here. Table 15.2.1A gives an overview of the configuration required to activate LOSC.

S. No	LOSC Specific Configuration	TCode	Transportable
1	Define Storage Types	SPRO	Yes
2	Define Layout-Oriented Storage Process Control	SPRO	Yes
3	Maintain Storage Type Search Sequence	SPRO	Yes
4	Define Control Indicators for Determining Warehouse Process Types	SPRO	Yes
5	Product Master Settings	/SCWM/MAT1	Yes
6	Determine Warehouse Process Type	SPRO	Yes

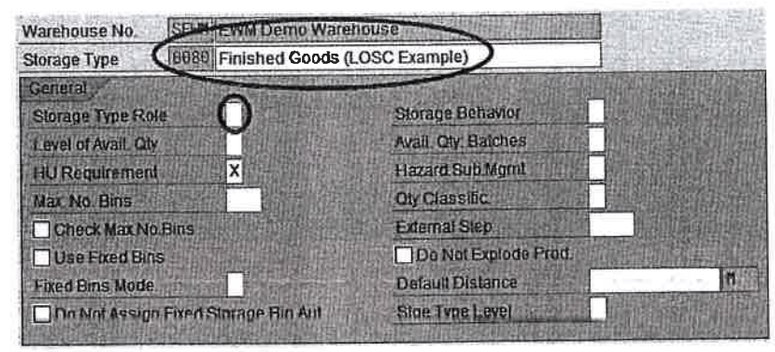
Table 15.2.1A - LOSC Configuration Overview

15.2.1.1 Define Storage Types

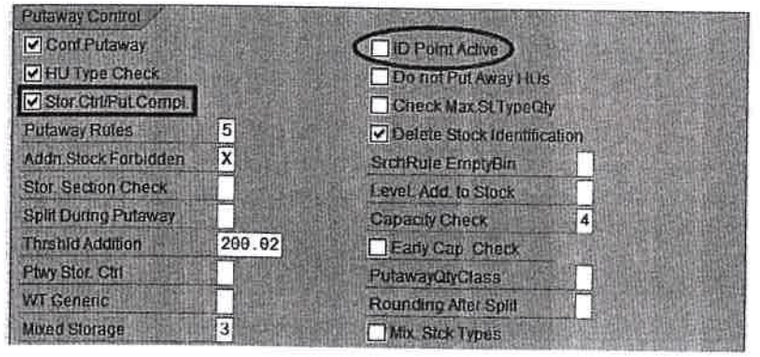
For LOSC, it is possible to use ID points and pick points for the intermediate point. Following screenshots will demonstrate how the final and elevator storage types can be configured.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Define Storage Type

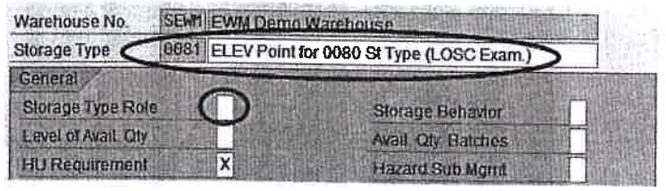
Storage type for Final Putaway: Here, the final storage type 0080, with HU requirement active, has been configured. This is a regular storage type with the role "Standard Storage Type."



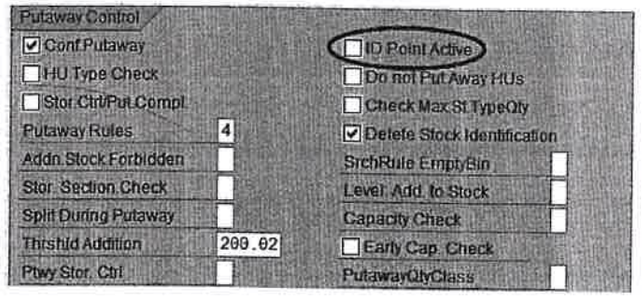
Under the putaway control section, the "Storage control/putaway complete" check must be active for LOSC for the final storage type.



Storage type for Elevator staging area: We have defined this as a standard storage type. All general settings are same as for final storage type.



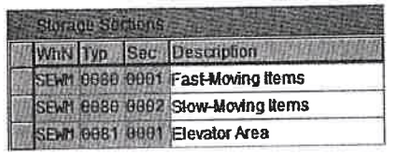
Under the putaway control section, the "storage control/ putaway complete" option is unchecked for elevator storage.



15.2.1.2 Define Storage Sections

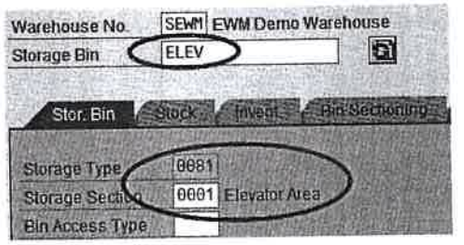
More than one storage section can exist for each of these storage types. Here, one section has been defined for storage type 0081 and two sections have been defined for storage type 0080.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Define Storage Section



15.2.1.3 Create Bins

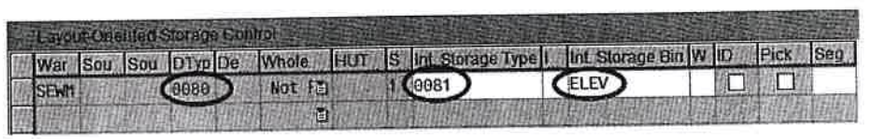
More than one bin can be created for each of these storage types (TCode /SCWM/LS01). This example has one bin, created manually for elevator storage type called "ELEV."



15.2.1.4 Define Layout-Oriented Storage Process Control

Based on the physical layout of the client's warehouse, consultants have to define the required LOSC settings for it. In the following screenshot intermediate storage type 0081 and bin ELEV is assigned to the destination storage 0080.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Layout-Oriented Storage Process Control



- **Source or Destination Storage Type:** This is used to control whether the LOSC is applicable while receiving and issuing the goods and whether the products need to be taken to the intermediate points or to the pick points.

- **Whole HU Indicator:** This is used to differentiate between moving a complete HU, an empty HU, or a partial HU.
- **HU Type Group:** This can be used to specify that a certain HU type should always be moved via some specific intermediate storage types.
- **Intermediate Storage Type:** Here, specify what the intermediate storage type will be.
- **Intermediate Storage Section/Bin:** This is optional. This can be used to specify where the products should be moved to. If this data is not maintained, the system will use the search sequence to determine the required data.
- **WPT:** The WPT defined here is used to create the WT to the intermediate storage location. This is required only for the pick point. The system doesn't use WPT for ID points.
- **Conveyor Technique Segment:** This is used only when working with the MFS.

15.2.1.5 Maintain Storage Type Search Sequence

In order to test this business scenario, the putaway control indicator has been set as 0080. We have used WPT 1010, which is a standard SAP-delivered process type.

Search Sequence Putaway

WhN	PACI	Proc	Qty Class	Stoc	Type	Use	EntToDisp	Srch Seq.	Putaway Rules
SEWM	0080	1010						0080	No Putaway Rule

In the storage type search sequence 0080, storage type 0080 has been assigned for final putaway.

Storage Type Search Sequence for Putaway

WhN	Srch Seq.	Se	Typ	STG	EvWh	Description
SEWM	0080	1	0080			Put Away in Storage Type 0080

15.2.1.6 Allow HU Types for Storage Type

If the HU check is active in the storage type, you must allow the appropriate HU type for the storage type. During the transaction, the HU type will be derived from its packaging materials. For this scenario, the HU type "Box" will be used.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Handling Units | Basics | Define HU Types for Each Storage Type

HU Types per Storage Type

WhN	Typ	HU Ty.	HU Ty.	HU Ty	HU Ty	HU Ty.
SEWM	0080	E1	E2	BOX		

15.2.1.7 Define Control Indicators for Determining WPTs

It is not necessary that the new WPT control indicator be defined for LOSC; however, it is recommended to create one for POSC and one for LOSC. The indicator has been set as 05 for the LOSC storage process.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Determine Warehouse Process Type

Control Indicator for Warehouse Process Type Determination

War	ProTypeDet	Description
SEWM	01	POSC Storage Process Active
SEWM	02	VAS Storage Process Active
SEWM	03	In-house Produced Materials
SEWM	04	Direct Putaway without Storage Process
SEWM	05	LOSC Storage Process Active

15.2.1.8 Product Master Settings

Maintain the appropriate values in the product master under the warehouse data tab (TCode /SCWM/MAT1). For this example, 05 has been used for the process type determination indicator, and 0080 for the putaway control indicator.

Product	4000014288	Base I
Prod. Descript.	EWM Demo - LOSC Example	
Warehouse No.	SEWM	EWM Demo Warehouse
Ent. to Dispose	2517	EWM Demo Plant

Units of Meas. | Classification | Pkg Data | Whse Data

General Data

Process Block Prof.		
Proc.Type Det. Ind.	05	LOSC Storage Process Active

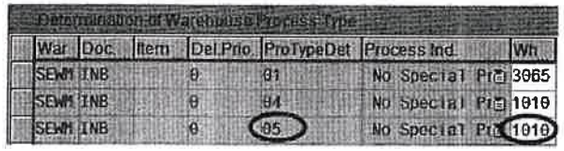
Putaway

Putaway Control Ind.	0080	LOSC Heavy Products
Planned Putaway Ctrl Ind.		

15.2.1.9 Determine WPT

Make an appropriate entry in the WPT determination table to determine the correct WPT as per the product master.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Determine Warehouse Process Type



15.2.1.10 Other Required Configurations

Along with the above configuration, it is recommended to verify the following configurations. They are covered in detail in the POSC section and in the previous chapter.

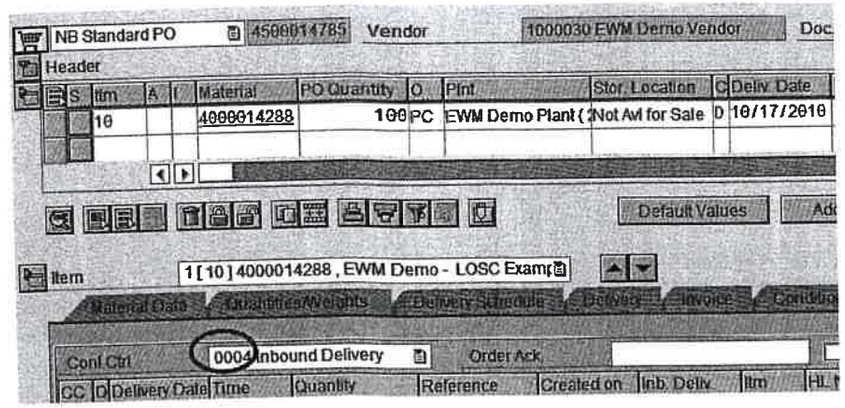
- Define or Generate Activity Areas for the Storage Types.
- Assign Consolidation Group to the Activity Area
- Define Search Sequence of Creation Rules for Activity Areas
- Define Work Center for Pick Point.
- Maintain Storage Section Search Sequence

15.2.2 Exercise—LOSC Configuration

In this section, the business scenario will be tested, starting from creating a purchase order in the ERP system. As a prerequisite, verify the material master, vendor master in the ERP system, and product master in the EWM system.

15.2.2.1 Create Purchase Order

To begin with, create a purchase order in the ERP system (TCode ME21N); verify the vendor, plant, and storage location for the entered product. The confirmation key for the PO line item should allow the creation of inbound deliveries.



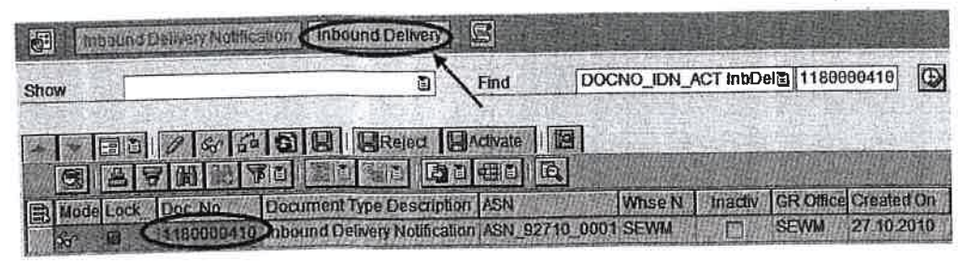
15.2.2.2 Create an Inbound Delivery

In TCode VL31N, enter the purchase order and ASN number in the external ID number field, and hit the "Enter" key.

In the delivery detail screen, enter the delivery quantity and click on the "Pack" button on the application toolbar to pack the product into HU. In the packing screen, pack the product into HU. Once the required data is entered, click "Save" to save the data in the inbound delivery. This will create an inbound delivery in the ERP system and will be transferred to the EWM system for further processing.

15.2.2.3 Verify IDN in the EWM System

Enter the ERP inbound delivery number and click the "Execute" button.

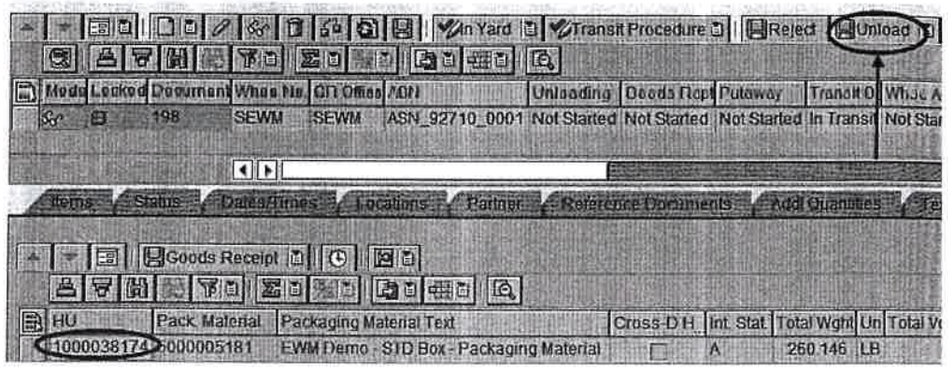


Select the delivery line item (TCode /SCWM/IDN) and click on the "Inbound Delivery" button on the application toolbar to locate the inbound delivery created in the EWM system.

15.2.2.3 Verify Inbound Delivery in the EWM System

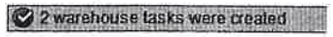
As of now, LOSC will work only with HU-managed stock. In the inbound delivery (TCode /SCWM/PRDI), verify that the stock is HU managed by clicking the "HU" tab in the delivery detail section.

Once the data is verified, click the "Unload" button. This will update the status. In standard configuration, the WTs will not be created automatically.

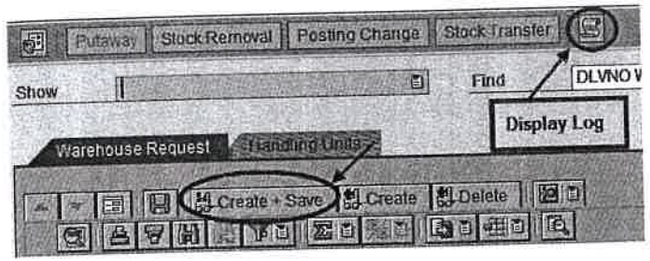


To create WT, click on "Inbound Delivery," "Follow-On Functions," and "Warehouse Task."

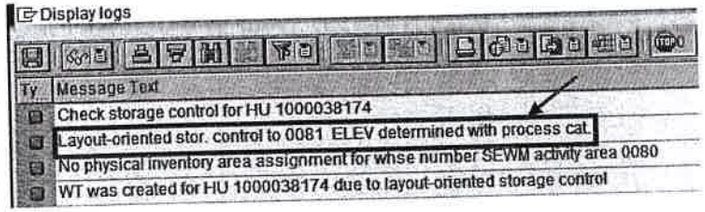
In the Warehouse Task "Create" screen, click the "Create + Save" button to create the WTs. For this business scenario, the system will create two WTs.



Click on "Message Log" to check the log created for the WT.

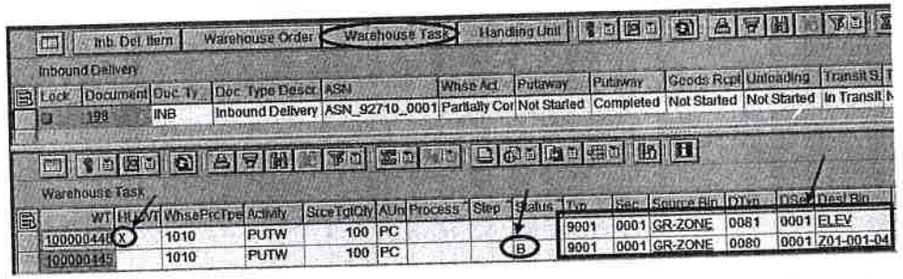


The system will show the determination of LOSC process and the details of the WTs created.



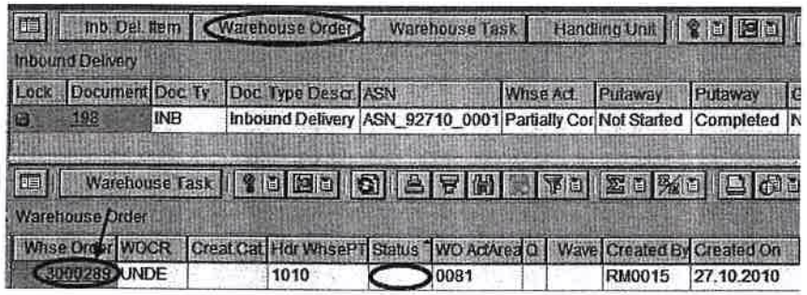
15.2.2.4 Process Warehouse Tasks

Go to TCode /SCWM/MON; enter the required details under "Inbound Delivery" to display the inbound delivery in the warehouse monitor. Select the inbound delivery line item and click on WT button. This will display the WTs created for the inbound delivery.



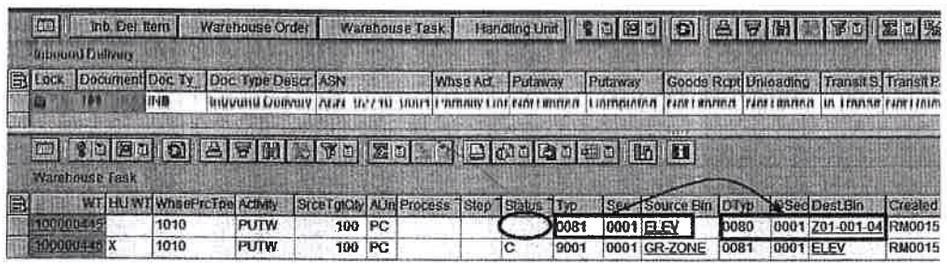
Note the source and destination location for each of the WTs and the status of the WT. The task to move products to the "ELEV" bin is active, and the final putaway task status is set to "B—Waiting." Click on the WO button to see the open warehouse orders.

Note that there is only one open WO for inbound delivery. Second WO will be created upon confirmation of the first WO.

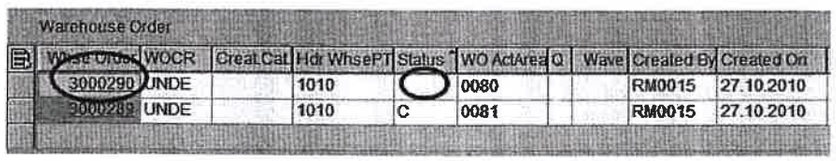


Click on the WO number and confirm the WO by clicking on the "Confirm + Save" button.

Upon confirmation of the WO, display the WT for the inbound delivery. Now the second WT is active, and the source information has been updated to "ELEV" storage type.

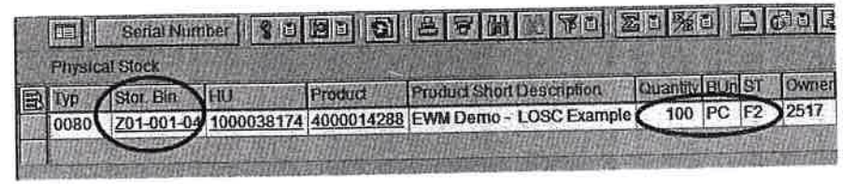


Click on the WO button to locate the open WO for the second WT. The system automatically creates a WO when the WT becomes active.



Click on the WO and click on the "Confirm + Save" button to confirm it. This will update the stock in the final storage type.

Verify the stock in the EWM and ERP systems. The stock should be now updated in the warehouse bin as well as in the ERP system.



15.3 Using Both POSC and LOSC

In the very complex warehouse, it is possible to have scenarios where both POSC and LOSC combinations have to be configured to meet the warehouse requirements. In EWM, POSC and LOSC can be combined to determine the products' movements in the warehouse.

If POSC and LOSC are combined, the EWM system will execute the POSC settings first. The LOSC then checks whether the sequence of putaway process steps are possible in layout view, and, if required, the system will adjust the flow of the putaway or stock removal.

In the following business scenario, the POSC and LOSC methods have been combined

Business Scenario for Combined POSC and LOSC

The products are packed in HU in the ERP inbound delivery. In the warehouse, products are stored on the second floor. The process followed in the warehouse is as follows: unload the HUs, move the HUs to the work center, and verify the packing in the work center. After verification, the HU has to be staged in the elevator area to move the products to the second floor. Finally, the products will be put away in the finished goods storage type.

Process flow for this business scenario is as follows:

- Unloading (IB01): Operator will unload the HUs from the truck and confirm in the EWM system. This will activate the WT to move the HU from the GR staging area to the work center area.
- Packing Verification (IB02): Operator will verify the HU and update the status in the system "Complete Process Step".
- Putaway (IB03): When the operator confirms packing verification, the system will locate the final putaway task. Because the LOSC is active, and product cannot be put away in the second floor without taking the HU to the elevator area, the system will create a new WT to move the HU from the work center region to the elevator area. The system will update the destination bin in the new WT and the source bin information in the final putaway task to the elevator area.
- LOSC Final Putaway: Once the elevator-related WT is confirmed, the final WT will be activated to move the product from the elevator area to the finished goods area.

15.3.1 Configuration Requirement

To demonstrate this business scenario, we have used the same configuration explained earlier in POSC and LOSC section with the following changes.

Create a new entry in "Maintain Storage Type Search Sequence" for PACI 0080 and warehouse process type 3065, as shown below.

Search Sequence Putaway

WhN	PACI	Proc.	Qt.	S	Type	U	Entl.	H	Haz.	Srch Seq.	Putaway Rules
SEWM	0080	3065								0080	No Putaway Rule

In the "Determination of Warehouse Process Type" menu, update WPT 3065 for Process Type Determination Indicator 05, as show below.

Determination of Warehouse Process Type

War	Doc	Ite	Del Prio	ProTypeDet	Process Ind	Wh
SEWM	INB	0	01		No Special Pr	3065
SEWM	INB	0	04		No Special Pr	1010
SEWM	INB	0	05		No Special Pr	3065

15.3.2 Exercise—POSC and LOSC combination

To test this process, we will use the same material used for LOSC testing with the same settings. In the ERP system, create a purchase order and an inbound delivery. In the inbound delivery, pack the products into one HU.

In the EWM system, locate the inbound delivery and confirm the unloading activity by clicking on the "Unload" button. This will create the WTs for POSC process.

2 warehouse tasks were created

Verify the WTs in the warehouse monitor for the inbound delivery. Note the source and destination storage bins for final putaway. Note the process, step, and status of each WT.

Inb. Del. Item | Warehouse Order | Warehouse Task | Handling Unit

Inbound Delivery

Locked	Document	Doc. Type	Doc. Type Descr	ASN	Whse Act.	Putaway	Putaway	Goods Rcpt	Unloading	Transit S.
	199	INB	Inbound Delivery	ASN_92710_0002	Not Started	Not Started	Not Started	Not Started	Not Started	In Transit

Warehouse Task

WT	HU WT	WhsePrcTpe	Activity	SrceTgtQty	AUn	Process	Step	Status	Typ	Sec	Source Bin	DTyp	DSec	Dest Bin
100000450	X	3065	PUTW	200	PC	INB1	IB01	C	9030		RE01	9002	0001	GR_AREA
100000452	X	3060	PUTW	200	PC		IB02		9002	0001	GR_AREA	8001	0001	INBOUND
100000449		3065	PUTW	200	PC		IB03	B	9002		GR_AREA	0080	0001	Z01-001-05

Click the "Warehouse Order" button to display the WOs for the inbound delivery. Confirm the open WO.

Warehouse Order

Whse Order	WOCR	Creat.Cat.	Hdr WhsePT	Status	WO ActArea	Q	Wave	Created By	Created On
3000292	UL01	F	3060					RM0015	27.10.2010
3000291	UL01	F	3065	C				RM0015	27.10.2010

Verify the WTs. Note the source bin details and status of the final putaway WT.

Warehouse Task

WT	HU WT	WhsePrcTpe	Activity	SrceTgtQty	AUn	Process	Step	Status	Typ	Sec	Source Bin	DTyp	DSec	Dest Bin
100000450	X	3065	PUTW	200	PC	INB1	IB01	C	9030		RE01	9002	0001	GR_AREA
100000452	X	3060	PUTW	200	PC		IB02		9002	0001	GR_AREA	8001	0001	INBOUND
100000449		3065	PUTW	200	PC		IB03	B	8001	0001	INBOUND	0080	0001	Z01-001-05

Go to transaction /SCWM/DCONS and select the work center. The HU should be visible in the work center. Select the HU and click on complete process step for HU. This will create a new WT to move the products to the elevator area and will become active. The new WT is created because of the LOSC settings.

Section/Bin/HU/Item
- Unpacked Goods
  - INBOUND
    - 1000038175
      - EWM Demo - LOSC Example
- Packed Goods
  - OUTBOUND

Create HU | Repack HU | Repack Product | Differences

HU	
Pack. Material	
HU/Storage Bin	OUTBOUND
Cons.Grp	
Number of HUs	1

Verify the new WT, its source, and destination bin details. The system has updated the destination location of the new WT to elevator area. Note the WT status for final putaway—it is still set to waiting.

Warehouse Task

WT	HU WT	WhsePrcType	Activity	SrceTgtQty	AUn	Process	Step	Status	Typ	Sec	Source Bin	DTyp	DSec	Dest Bin
100000450	X	3065	PUTW	200	PC	INB1	IB01	C	9030		RE01	9002	0001	GR_AREA
100000452	X	3060	PUTW	200	PC		IB02		9002	0001	GR_AREA	8001	0001	INBOUND
100000453	X	3065	PUTW	200	PC		IB03		8001	0001	INBOUND	0081	0001	ELEV
100000449		3065	PUTW	200	PC			B	8001	0001	INBOUND	0080	0001	Z01-001-05

Confirm the open WO to putaway the stock to the elevator storage area. This will change the status of the final WT to active, and the WO will be created to putaway the products in the destination bin. Confirm the warehouse order, which will update the warehouse bin stock and ERP system stock.

Warehouse Task

WT	HU WT	WhsePrcType	Activity	SrceTgtQty	AUn	Process	Step	Status	Typ	Sec	Source Bin	DTyp	DSec	Dest Bin
100000450	X	3065	PUTW	200	PC	INB1	IB01	C	9030		RE01	9002	0001	GR_AREA
100000452	X	3060	PUTW	200	PC		IB02		9002	0001	GR_AREA	8001	0001	INBOUND
100000449		3065	PUTW	200	PC		IB03		0081	0001	ELEV	0080	0001	Z01-001-05
100000453	X	3065	PUTW	200	PC				8001	0001	INBOUND	0081	0001	ELEV

Verify the stock in the EWM and ERP systems. Stock should be now updated in the warehouse bin as well as in the ERP system.

Stock Overview

Typ	Stor. Bin	Product	Batch	ST	Incom. Qty	Outg. Qty	AvlQtyBUoM	Quantity	BUn
0080	Z01-001-04	4000014288		F2	0	0	100	100	PC
0080	Z01-001-05	4000014288		F2	0	0	200	200	PC

Summary

This section explained how to use POSC and LOSC methods for warehouse requirements. This completes the putaway process of EWM. The next chapter will explain how to process the outbound delivery in the EWM system.

Chapter 16: Outbound Delivery Processing

This chapter is broadly divided into three sections: basic goods issue, cancel picking, and pick denial. The basic goods issue section covers the configuration required for picking the products for the goods issue process. The cancel picking section covers how to put back the stock if there is a cancellation. The pick denial section covers how to manage exceptions at the time of picking.

16.1 Basic Goods Issue (GI) in EWM

The base document for the GI process is outbound delivery request (ODR). It gets created automatically in the EWM system when the ERP outbound delivery is transferred to the EWM system. If no errors are found in the ODR document, the system will automatically create the outbound delivery order (ODO) using PPF functions. In case of an error, the user can manually correct the error and activate the document, which will create the ODO in the system. ODO is essential for initiating the warehouse process. It is also called a warehouse request document for picking process. Chapter 10 already covered the process flow of EWM outbound process and the related documents in the outbound process.

This section will cover the required configuration for basic goods issue and how to process outbound-related documents in the EWM system.

16.1.1 Warehouse Process Type

Like with inbound delivery processing, when the outbound delivery order (ODO) is created, the system determines a WPT for each line item. Previous chapters have already covered the configuration and settings available for WPT in detail. Hence, those details will not be repeated here. Only the required settings for outbound delivery will be described.

The GI warehouse process type must have the warehouse process category as "2—Stock Removal," the activity selected as "Pick," and the destination location details. Destination details can also be optional, depending on the business scenario.

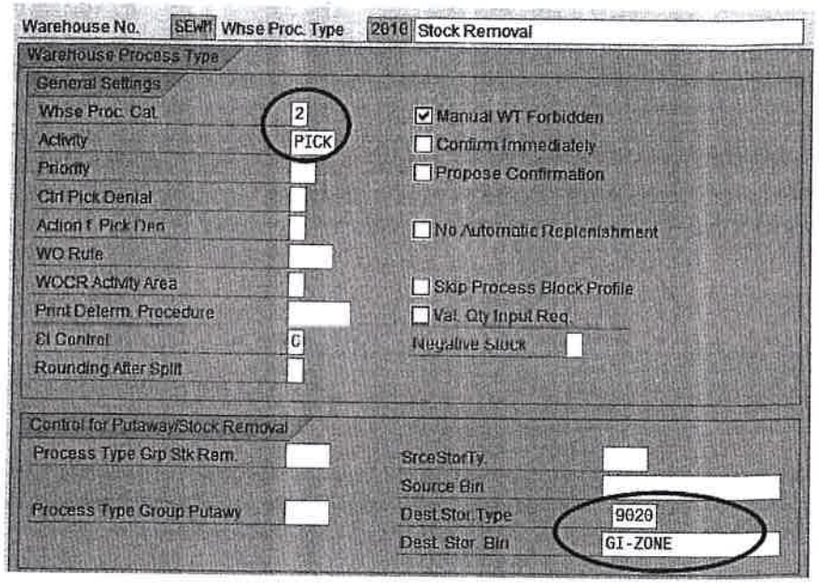
The following settings are optional and can be used, depending on the business requirements.

- SI Control: New stock identification
- Automatic Wave Determination: Yes, if working with picking waves
- Rough Bin Determination: Yes, if picking waves are defined by storage type

- Destination Storage Type/Bin: Used to specify the final destination location where the goods are staged or loaded from.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Warehouse Process Type

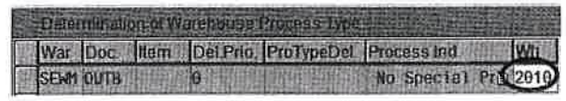
In standard SAP, WPT 2010 is configured for stock removal, which is used for direct picking from the source bin to destination staging area 9020.



16.1.2 Warehouse Process Type Determination

WPT is determined for the combination of warehouse number, document type, item type, delivery priority, and process type control indicators. The warehouse number and document type are derived from the source document (ODR) and mandatory for determining the WPT. Other parameters like item type (derived from ODR), delivery priority (derived from ODR), and process type control indicators (derived from product master) are optional.

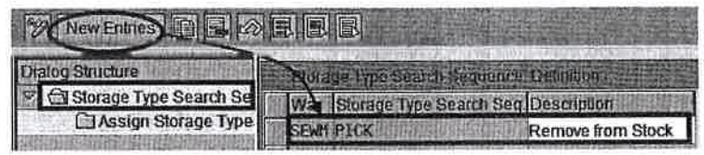
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Determine Warehouse Process Type



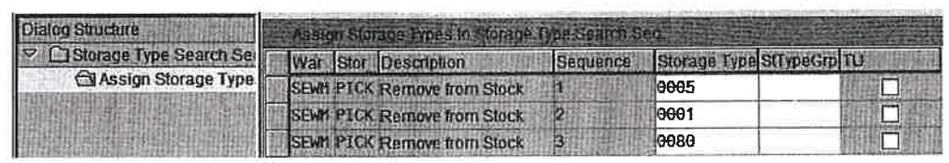
16.1.3 Storage Type Determination

While creating pick WTs, the system determines the appropriate source bin from which the products have to be picked. In order to determine the appropriate source storage types, the storage types search sequence must be defined in the system. This sequence contains the list of storage types that system should search and the sequence in which they should be searched. Once the search sequence is determined, the system will search for available stock of products in each of the storage types in a given sequence until it satisfies the requirement quantity. The system can also be configured to allow partial picking or to terminate the picking processes in case of partial picking.

To define the storage type search sequence, follow menu path **SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Strategies | Specify Storage Type Search Sequence**, click the "New Entries" button; enter the warehouse number, storage type search sequence, and the description as shown below.



Select the storage type search sequence and click on the "Assign Storage Type" option under "Dialog Structure" to assign the storage types. The "New Entries" option can be used to add new storage types to the search sequence. If the stock in Transportation Units has to be considered for picking, check the TU checkbox active.



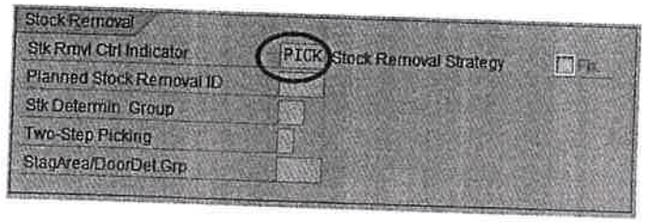
16.1.4 Stock Removal Control Indicator (SRCI)

Like putaway control indicators, SRCI is normally used to control the product-specific storage type search and is defined in menu path **SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Strategies | Define Stock Removal Control Indicator**

Stock Removal Control Indicator

War	SRCI	Description
SEWM	PICK	Stock Removal Control Indicator

In the product master (/SCWM/MAT1), SRCI is assigned to the "Stk Rmvl Ctrl Indicator" field under the stock removal section of the "Warehouse Data" tab.



16.1.5 Determine Storage Type Search Sequence

Based on the parameters from ODO, the product master, and the hazardous material master data, the system determines the storage type search sequence and the stock removal rule. The following parameters are used to determine the storage type search sequence:

- Two-step picking: Derived from Warehouse/Product/Wave
- Stock removal control indicator: Derived from product master
- Warehouse process type: Derived from ODO
- Quantity classification: Derived from packaging specification
- Stock type/Group: Derived from ODO
- Sales order stock or project stock indicator: Derived from ODO
- Stock usage (consignment/subcontractor): Derived from ODO
- Hazard rating 1 and 2: Derived from ODO (i.e., hazardous ratings for the product)

Storage type search sequence determination is defined in menu path **SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Strategies | Determine Storage Type Search Sequence for Stock Removal**

Determine Storage Type Search Sequence: Stock Removal

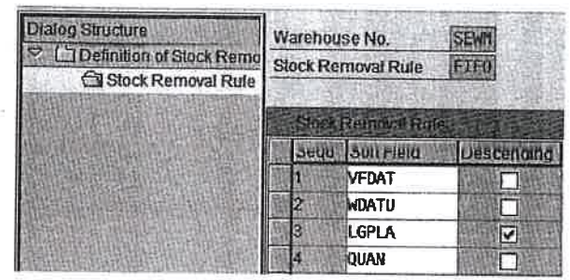
War	2	SRCI	Wh	Q	Stoc	Tpe	Use	H	HazRat2	Stor	Re
SEWM			2010							SMAL	
SEWM		PICK	2010							PICK	

16.1.6 Stock Removal Rule

The stock removal rule defines the sequence in which the quants should be sorted. For this, we maintain a sort field in the stock removal rule. The quant sorting can contain a maximum of thirty fields. For each field, this sorting can be ascending or descending.

Stock removal rules are stored in storage types, storage type groups, and storage type search sequence.

If the stock removal rule is stored in the storage type search sequence, then it applies for all storage types. If no rule is stored here, then the system considers the rule from the storage type group or storage type. To define the stock removal rule, follow the menu path **SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Strategies | Specify Stock Removal Rule**



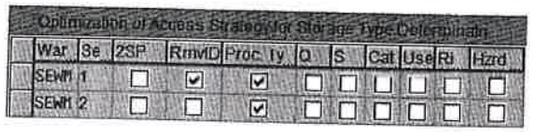
16.1.7 Optimization of Access Strategies for Storage Type Search Sequence

For a large range of products, stock types, and special stocks, the number of entries in the search sequence table will also be very large. To reduce the number of entries, an access strategy can be assigned to the storage type search sequence table. The system uses this access strategy to search storage type, as shown below:

- The system checks whether there is group assignment (for Wh. Process Type/Stock Type) and uses the group to read search sequence table.

- The system first attempts to read a completely qualified entry, meaning one that matches with all relevant indicators in the storage type search table.
- If the system cannot find an entry in the storage type search table, it attempts to reread this table, using the access strategy.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Strategies | Optimization of Access Strategies for Stor. Type Determination in Stock Rmvl

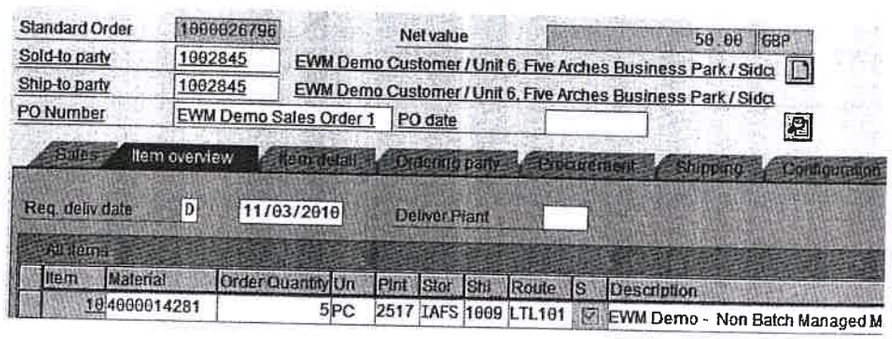


16.1.8 Exercise—Basic Goods Issue

This process can be tested, either starting with a sales order or by creating a delivery without reference in the ERP system. This example will start with a sales order.

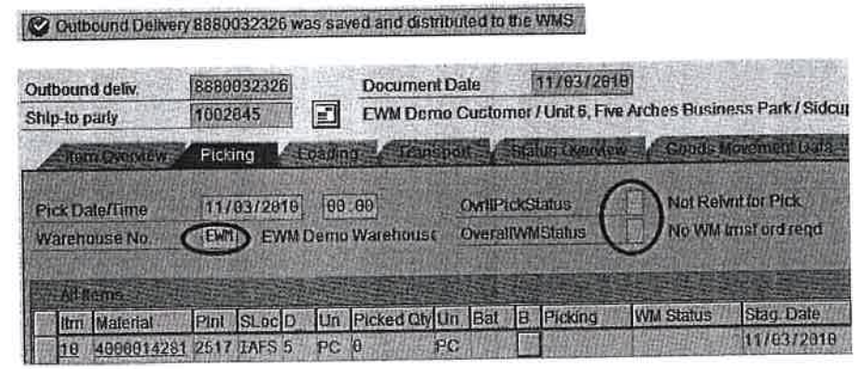
16.1.8.1 Sales order: VA01

To begin testing the basic GI process, this exercise will create a sales order in the ERP system (transaction VA01). In the sales order, enter material, quantity, plant, storage location, sold to party, and ship-to party, along with other required fields like sales order type, sales area information, and so on. The plant, storage location, materials, and shipping point entered here should belong to the EWM warehouse. Partners like ship-to party, sold-to party, freight forwarding agent, should have corresponding business partner data in the EWM system.



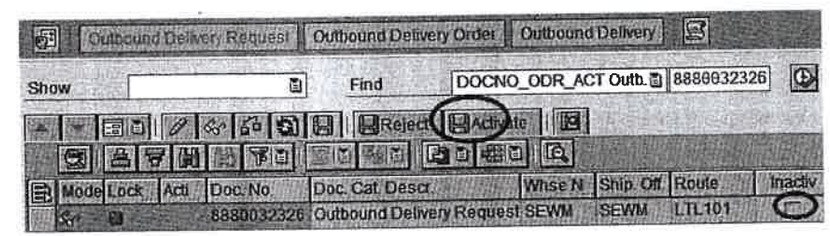
16.1.8.2 Create Outbound Delivery

An outbound delivery can be created directly from the sales order screen or from TCode VL01N. Like inbound delivery, outbound delivery created in the ERP system will be distributed to an EWM warehouse. Once the outbound delivery is saved, it cannot be edited in the ERP system.



16.1.8.3 Outbound Delivery Request (ODR)

The outbound delivery transferred to the EWM system becomes an ODR document. It will have the same number as the ERP delivery number. The PPF actions can be set to create ODO automatically for an active ODR. If ODR is not activated due to some error, it can be activated manually by correcting the error. This will create ODO in the background. ODR can be viewed in TCode /SCWM/ODR.



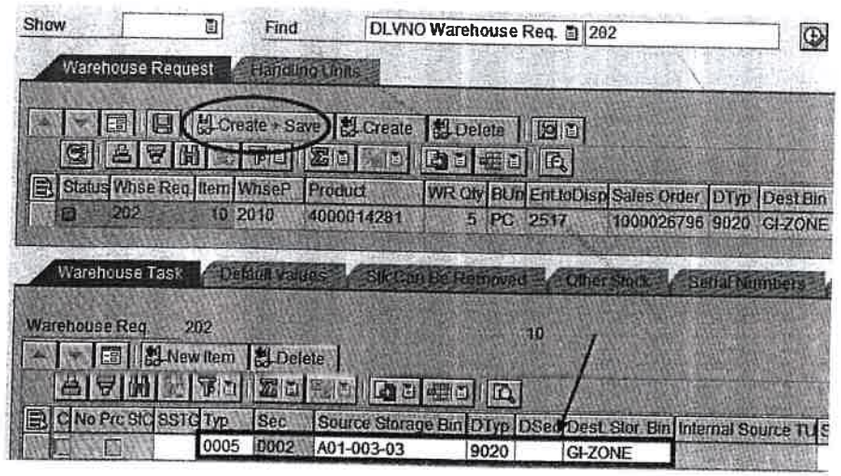
16.1.8.4 Outbound Delivery Order (ODO)

ODO can be located directly from the ODR screen (TCode /SCWM/PRDO) by selecting the ODR line item and clicking the "Outbound Delivery Order" button on the application toolbar. ODO is also called a warehouse request (WR) document. Various terms like picking, packing, loading, and GI describe the current status of the WT.

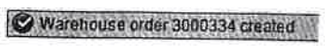
16.1.8.5 Warehouse Task

A picking WT can be created directly from the ODO screen or from menu path **SAP Easy Access | Extended Warehouse Management | Work Scheduling | Create Warehouse Task for Warehouse Request | Stock Removal for Outbound Delivery Order (TCode: /SCWM/TODLV)**

To create the WT, select the warehouse request and click on the "Create + Save" button. To verify the source and destination bin details, click the "Create" button, which will display the source and destination bin details for the WT. After the verification, click "Save" to create the WT.

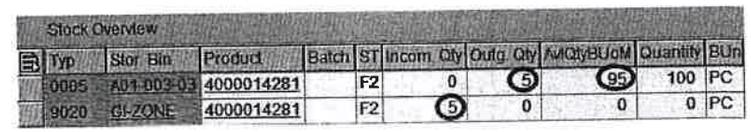


In the background, the WO will be created for the WT.



16.1.8.6 Warehouse Stock

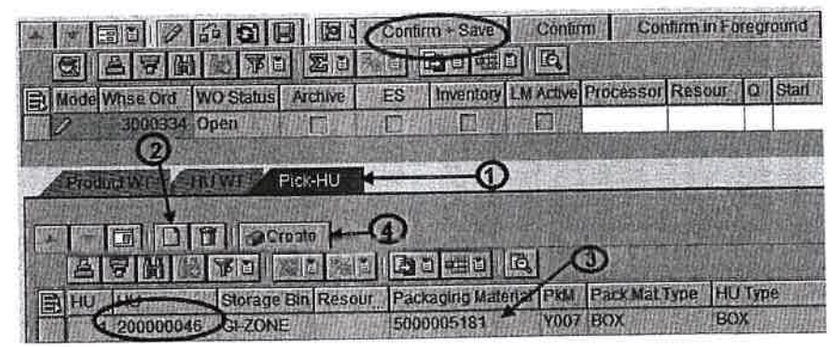
In the warehouse monitor (TCode /SCWM/MON), verify the stock before confirming the warehouse order. A stock overview will be displayed as incoming stock in the GI area and outgoing from the source bins, as shown below.



16.1.8.7 Pack and Confirm WO

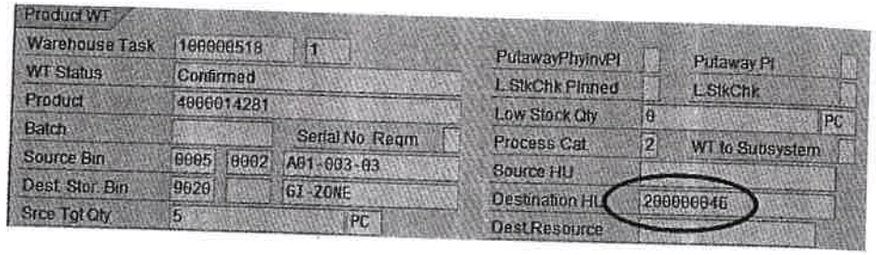
Packing of products during picking (Creation of Pick-HU) can be done manually (TCode /SCWM/TO_CONF), at the time of confirming the WO; or automatically in the background; or they can be packed in the work center, using POSC.

To create pick-HU manually, go to the WO confirmation transaction, enter the WO number, click the "Pick-HU" tab, click the "New" icon, enter the packaging material, and click the "Create" button with the HU icon. This will create the pick HU.



To confirm the WO, click the "Confirm + Save" button. The WO can also be confirmed in the foreground by clicking the "Confirm in Foreground" button.

When the WO is confirmed, the system will automatically pack the product into pick HU, as shown below in the screenshot.



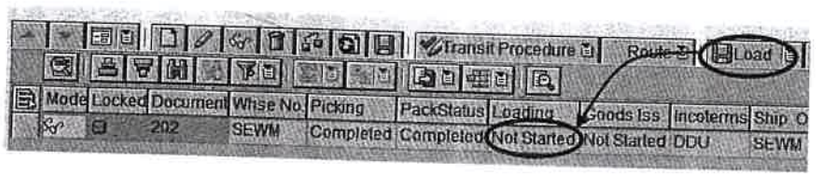
16.1.8.8 Loading Activities

After the picking activities are completed and the products are staged in the goods issue area, usually the processes within the warehouse are complete; and the shipping activities like loading, yard management, and transportation begin. Yard management and transportation is part of "Advanced Concepts of EWM" book.

In EWM, loading of trucks can be performed in two ways.

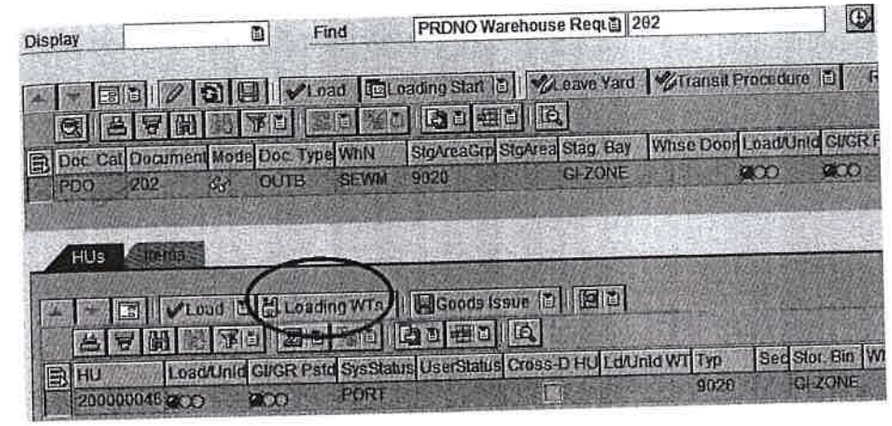
- **Simple Loading: /SCWM/PRDO**

Once the picking WTs are confirmed and goods are staged in the GI area, they can be loaded onto the truck using simple loading. For simple loading, it is only necessary to update the loading status of ODO or HU. For this, select the ODO line item and click the "Load" button. This will update the loading status and show it as complete. In order to load Multiple ODOs, transaction "Process Vehicle (/SCWM/VEH)" or "Process TU (/SCWM/TU)" is available.



- **Complex Loading: /SCWM/LOAD**

For complex loading, a loading WT can be created manually in transaction /SCWM/LOAD. It can also be created automatically by storage control or through PPF actions when TU arrives at the door. In addition, loading rules can also be maintained, influencing loading time, while defining staging areas.



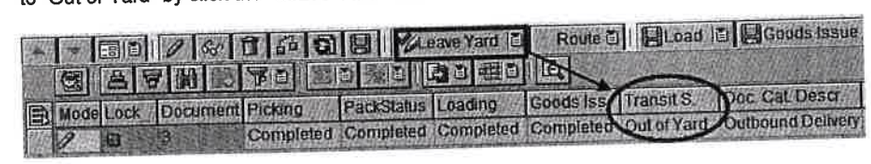
Once the loading WT is created and activated, WOs will be created automatically in the background. Confirming these WOs will be the same as confirming any other WO.

16.1.8.9 Post Goods Issue (PGI)

After the ODOs or HUs are loaded, GI can be posted for the delivery (TCode /SCWM/PRDO). However, for PGI, loading is not a mandatory step. GI can also be posted to multiple deliveries by posting "Goods Issue for Vehicle" (transaction /SCWM/VEH) or TU (transaction SCWM/TU).

Once the GI is posted, the GI status of the ODO gets updated to "Completed," and the system will create an outbound delivery document in the EWM system as proof of delivery. In the background, the system will also transfer the HU data to ERP delivery and will post the GI in the background.

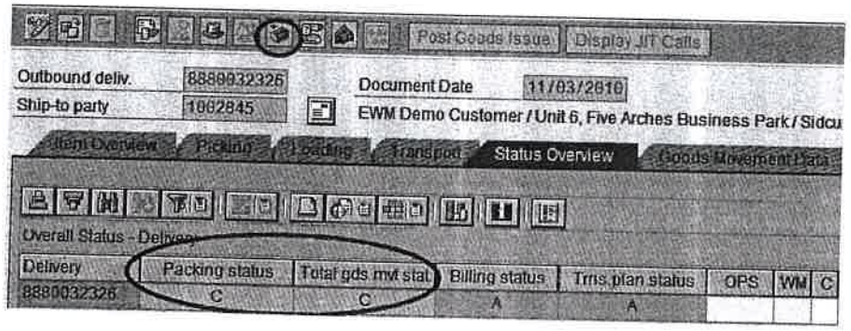
When the truck leaves the warehouse yard, the transit status of the outbound delivery can be updated to "Out of Yard" by click the "Leave Yard" button.



16.1.8.10 Verify HU Data in the ERP Outbound Delivery

When the goods are issued in the EWM system, the system will automatically update the ERP outbound delivery with the HU data and post the GI. No further action is required in the ERP system.

The HU data can be verified on outbound delivery (TCode VL03N) by clicking on the "Pack" button in the outbound delivery.



16.2 Cancel Picking

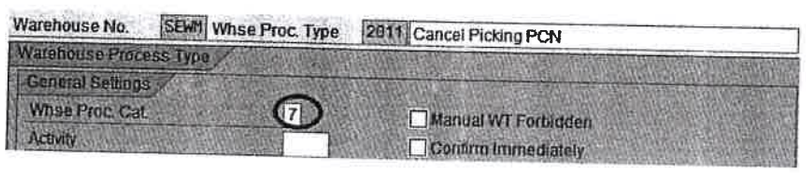
In certain circumstances, if it is necessary to reverse a confirmed task, users can perform "Cancel Picking." The following configuration should exist to perform cancel picking. In the Cancel Picking transaction, the user can release the picked stock and manually create an ad-hoc WT without reference; or release and create a WT in the foreground; or release and create a WT in the background for the put back quantity.

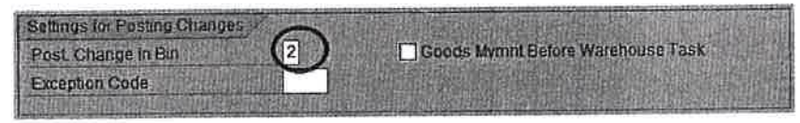
16.2.1 Define Warehouse Process Type for Putback

When picking is canceled, stock gets released from the delivery document and becomes available to putaway in the warehouse.

In the putback WPT, two important settings are warehouse process category (select value 7—posting change) and posting change bin (select value 2). Because in the EWM system, cancelling the picking is part of the posting change process, the WPT should have posting change related values selected here.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Cancel Picking | Define Warehouse Process Type for Putback

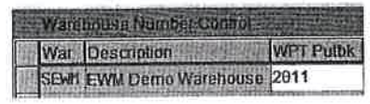




16.2.2 Define Warehouse Number Control for Putback

This menu assigns the WPT defined for putback to the warehouse number. The system will use this process type as the default whenever the "Cancel Picking" transaction is executed.

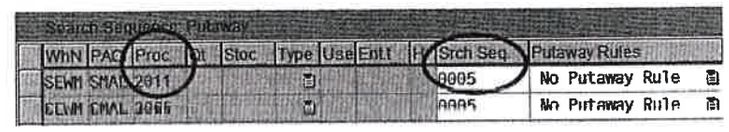
Menu path: SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Cancel Picking | Define Warehouse Number Control for Putback



16.2.3 Specify Storage Type Search Sequence for Putaway

In order to automatically determine the destination storage bins for the putback WTs, a storage type search sequence must be specified for the putback warehouse process type.

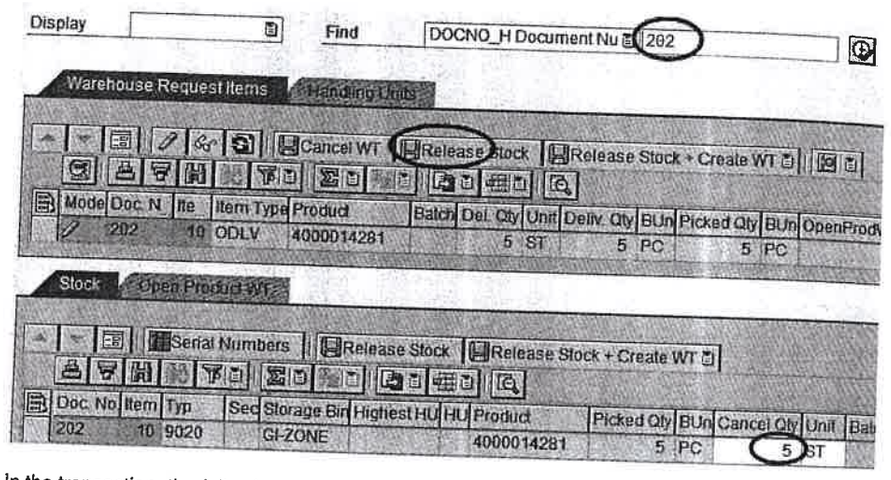
Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Strategies | Storage Type Search | Specify Storage Type Search Sequence for Putaway



16.2.4 Cancel Picking

The menu path to access cancel picking is **SAP Easy Access | Extended Warehouse Management | Execution | Cancel Picking or TCode /SCWM/CANCPICK**

In the "Document Number" search field, enter the WR/ODO number containing the item that is to be canceled.



In the transaction, the following options are available:

- **Release stock:** To release the stock, select the WR item and click the "Release Stock" button. The system creates and confirms a WT for posting change, which releases the stock for putaway. This means that the stock remains in the GI bin and not reserved for picking. You need to create Ad-hoc Product Task manually (Bin-to-bin transfer) to send the stock back to storage types.

  If you click on "Release Stock + Create WT in Foreground," the system first creates and confirms a WT for posting change, which releases the stock. Also, the system opens user entry screen for creating Ad-hoc Product Task, where the destination bin details and WPT need to be entered.

  If you click on "Release Stock + Create WT in Background," the system first creates and confirms a WT for posting change, which releases the stock. Also, the system creates another putback task with the same WPT (in this example, it is 2011) and determines the destination bin automatically, with storage type search sequence and putaway strategy maintained for that WPT.

- **Cancel a partial quantity of the picked delivery quantity:** To do this, select the WR item, in the "Cancel Quantity" field in the Stock tab, specify enter the quantity that should be cancelled.

16.3 Pick Denial

In certain circumstances, it is possible that EWM cannot create a WT for the outbound delivery quantity, or that it can create a WT for only a partial quantity. This could be caused by various factors, such as

the system cannot find stock, a storage bin is blocked for picking, and so on. Such exceptions can be managed in the EWM system using the pick denial function.

Pick denial can be used to trigger actions such as create a WT for partial stock, or do not create a WT for partial delivery quantity due to full delivery quantity requirement, or adjust the delivery quantity to WT quantity.

In the warehouse, a pick denial can happen in the following two situations:

- **Pick denial during WT creation:** At the time of WT creation, if the EWM system cannot find enough stock to meet the requested quantity, the system can be set up to trigger a pick denial. This typically happens if the warehouse stock is stored in the nonpicking relevant zones or if the product in the storage bin is blocked for some reason.

- **Pick denial at the time of WT confirmation:** In this case, the WT is confirmed with less quantity than requested, and no other stock can be found in the warehouse. This occurs when a discrepancy between the system quantity and actual quantity exists in the warehouse bin. In such scenarios, the system can be set up to automatically execute a pick denial.

In both cases, using a workflow, pick denial information can be forwarded to the ERP system so that the open quantity can be forwarded to another warehouse before the GI is triggered in the origin warehouse, thus providing better customer service.

16.3.1 Configuration of Pick Denial

The following configurations must exist in order to trigger pick denial.

16.3.1.1 Activate Pick Denial at Warehouse Number Level

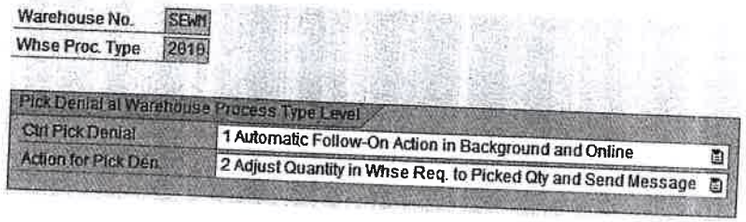
The pick denial has to be activated at the warehouse number level.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Pick Denial | Activate Pick Denial at Warehouse Number Level

16.3.1.2 Specify Pick Denial at WPT Level

The pick denial processing actions are configured at the WPT level, as shown below.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Pick Denial | Specify Pick Denial at Warehouse Process Type Level



Settings available are:

- **Control Pick Denial:** This determines how pick denial is to run on dialog and background modes. Users can choose one of following options.

  i. **Warning for dialog, automatic follow-up action in background:** In the dialog, the system issues a warning. The predefined action to be performed after a pick denial can be changed. The follow-up action is performed automatically in the background.

  ii. **Automatic follow-up action in dialog and in background**: The system does not issue a warning message. Users do have the option to change the action performed after a pick denial.

- **Action for Pick Denial:** This determines what action is to be performed for pick denial, such as:

  i. Adjust warehouse request quantity to picked quantity

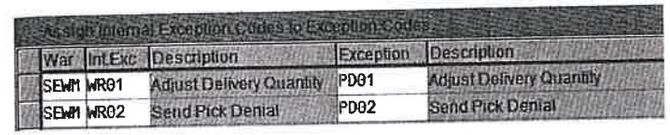
  ii. Adjust warehouse request quantity to picked quantity and send message

  The entry maintained in "Action for Pick Denial" will be defaulted in the WT creation transaction ("Pick Denial" tab).

16.3.1.3 Assign Internal Exception Codes to Exception Codes

The following menu can be used to assign internal exception codes to external exception codes. Internal and external exception codes are covered in more detail in the next chapter.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Pick Denial | Assign Internal Exception Codes to Exception Codes

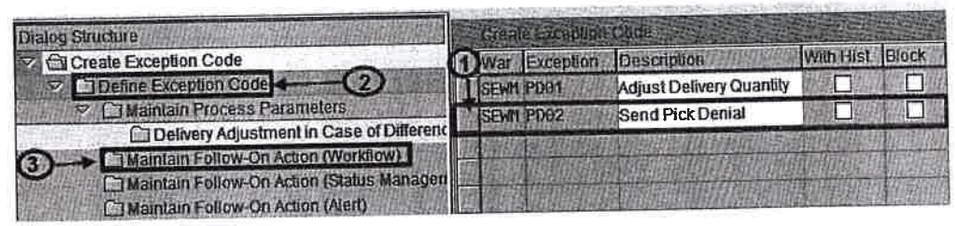


16.3.1.4 Activate Workflow Process to Send Pick Den. to ERP Sys.

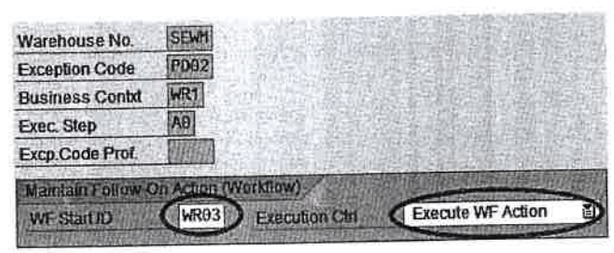
If the workflow process is to be triggered, it must be enabled for the required exception code. In this example, exception code PD02 is used communicate the pick denial to the ERP system and adjust the ERP delivery quantity.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Define Exception Codes

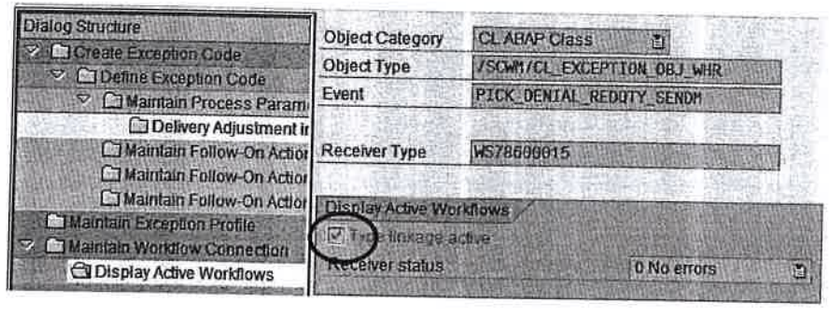
Here, select the PD02 line for the warehouse, double-click on the "Define Exception Code" option in the dialog structure, and then double-click on the "Maintain Follow-On Action (Workflow)" option, as show below.



Here, verify that the "WF Start ID" and "Execution Control" fields are set to appropriate values. In the standard configuration, the value for "WF Start ID" is "WR03"; and for "Execution Control," it is "Execute WF Action."



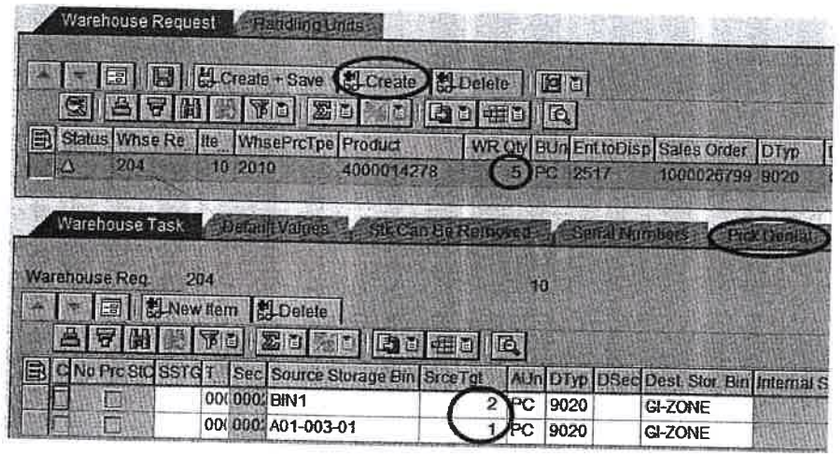
In the dialog structure, select "Maintain Workflow Connection," select the line WR03 for the warehouse, double-click on "Display Active Workflows," and verify that the "Type linkage active" check box is checked.



If the check box is not checked, type linkage can be activated in TCode SWE2.

16.3.1.5 Exercise—Pick Denial

In the following example, delivery is created for five PCs, but in the warehouse only three PCs are available. At the time of WT creation, the system will issue a warning message that WT is created for the partial quantity and will enable the "action for pick denial" field to enter the pick denial code.



The code entered in the "Action for Pick Denial" field will create a WT and workflow item. When the workflow item is processed, the system will automatically adjust the WR quantity and ERP delivery quantity to the picked quantity. Workflow items can also be processed manually in TCode SWIA.

Notes:

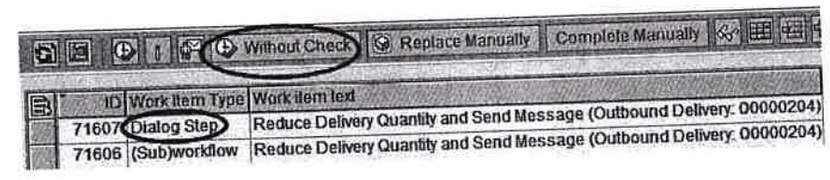
If the requested quantity is available for picking, in the "Pick Denial" tab, the "Action for Pick Denial" field will be disabled.

16.3.1.6 Execute the Workflow Item Manually

To execute the workflow item manually, go to TCode SWIA or follow the menu path **SAP Easy access | SAP menu | Tools | Business Workflow | Development | Administration | Workflow Runtime | Execute Work Item without Agent Check.**

Here, choose the "Execute" button. This will display the results for all the workflow items.

In the resulting list, identify the work item text that belongs to the warehouse request. Select the line item with text "Dialog Step" (under "Work Item Type" column) for the WR document and click on "Execute or Execute without Check". This will trigger the configured workflow for the selected item.



Notes:

In order to trigger the workflow, the required workflow customizing, and other settings like WF-batch user, event type linkage workflow tasks, workflows configurable customer processes has to be setup in the systems. This is done by the Basis team and workflow consultants and is not covered here.

Summary

This chapter has explained the required configuration for the basic outbound picking, loading, and GI posting. It has also explained how to reverse the picking and put the stock back in the warehouses. This chapter covered the required configuration for pick denial and different ways of triggering pick denial in the picking transaction.

Chapter 17: Exception Handling

Exception handling is a new feature in EWM and does not exist in ERP WM. This was introduced to bridge (or at least minimize) the gap between the physical data and system data and to take corrective actions for day-to-day warehouse exceptions.

In EWM, exception handling also enables the warehouse operator to continue the operation when an exception occurs by entering the exception code. Example: A warehouse operator has a pick task with a quantity of 10 from the ABC bin, but physically the bin is empty. The operator can enter the exception code and change the source bin; or trigger the replenishment for this bin and, after replenishment, pick the quantity; or send an alert to the warehouse supervisor to take further actions.

Because exception handling is fully integrated in the EWM system, it can be activated for all the warehouse process steps and can be entered in every goods movement transaction. This can also be connected to the following functions:

- **SAP Alert Framework**: Precondition is that the alert framework/notification engine has to be implemented through the SCM basis path.
- **SAP Status Management**: Precondition is that the SAP status management has to be implemented. (e.g., user status, status network possible, workflow connection).
- **SAP Workflow**: Precondition is that workflow has to be set up. (e.g., workflow customizing, WF-batch user, event type linkage workflow tasks, workflows configurable customer processes).

This chapter is broadly divided into two sections: business context and exception codes. Business context is the business process where an exceptional situation can occur. Exception codes are used to record and manage the exceptions that occur in almost every business process. Each section will cover the required configuration in detail.

17.1 Maintain Business Context for Exception Codes

Business Context is the business process where an exceptional situation can occur. Examples include confirmation of WT, PI count, and so on.

Table 17.1A shows an overview of the configuration that is covered under this section.

S. No	Configuration Items	TCode	Transportable
1	Maintain Exception Code Context	SPRO	Yes
2	Maintain Operation	SPRO	Yes
3	Maintain Internal Process Code	SPRO	Yes
4	Maintain Internal Exceptions	SPRO	Yes

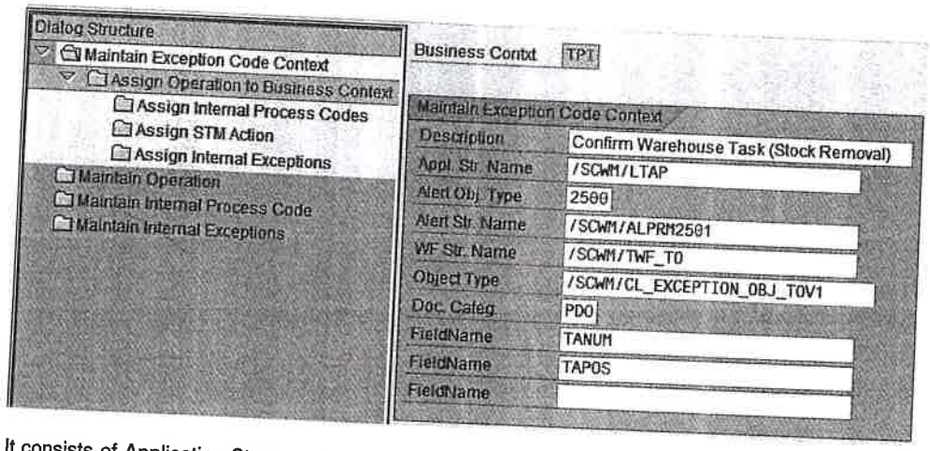
17.1A - Configuration list for Business Context Definition

17.1.1 Maintain Exception Code Context

As of EWM 7.0, SAP has provided around twenty-five preconfigured exception code contexts, which cover most of the business requirements. These are client independent and not warehouse specific.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Maintain Business Context for Exception Codes

The following is an example of the standard exception code contexts defined for confirmation of WT for the stock removal process.



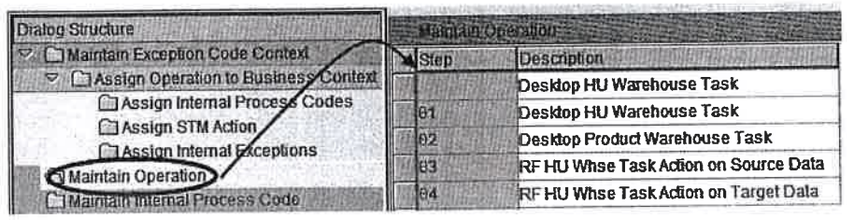
It consists of Application Structure for the import of different application data; Alert Object Type, which groups alert types according to the objects to which the alerts relate; Alert Structure Name for the dynamic transfer of application data in an alert; Workflow Structure Name (i.e., name of structure for persistent workflow data); Object Type, which is the identifier that specifies the type of an object (for example, by the name of a class, if the object is an instance of an ABAP object class) in a persistent

object reference (POR) or local persistent object reference (LPOR); and the Doc Category, which is the classification of the different documents that the system can use for delivery processing.

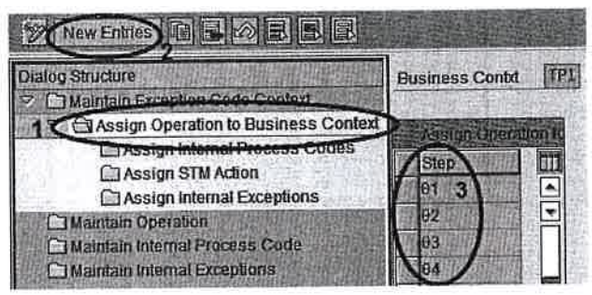
17.1.2 Maintain Operation

Here, the operation represents the process execution step defined for a particular warehouse operation (business context). Examples include desktop product task, RF product task action on source data, and so on. As of EWM 7.0, SAP has provided around forty-six preconfigured execution steps (operation).

To display the list of operations, double-click on "Maintain Operation" in the dialog structure:

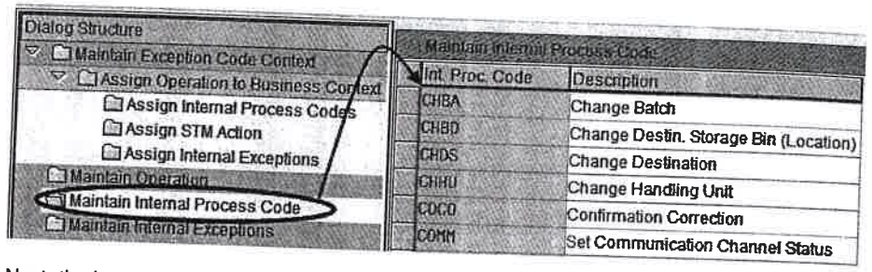


Once the operations are defined, they have to be assigned to the business context. To assign, double-click on "Assign Operation to Business Context" option in the dialog structure, click on "New Entries," and enter the appropriate operation as a step.

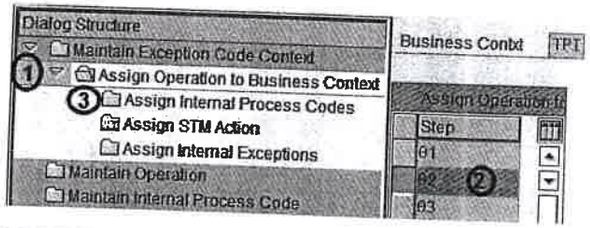


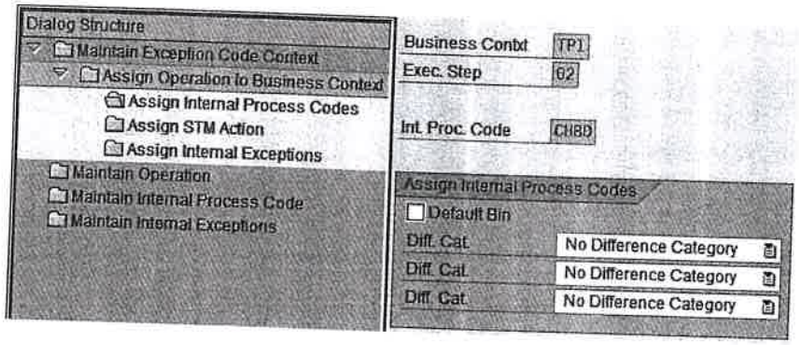
17.1.3 Maintain Internal Process Code

As of EWM 7.0, SAP has provided around forty-six internal process codes. It controls internal program reactions after an exception code is entered. After internal process codes are defined, they must be assigned to the appropriate exception codes. For example, CHBD—Change Destination Storage Bin is an internal process code. When an exception code that has CHBD as its internal process code is entered, the system permits changing the destination bin.



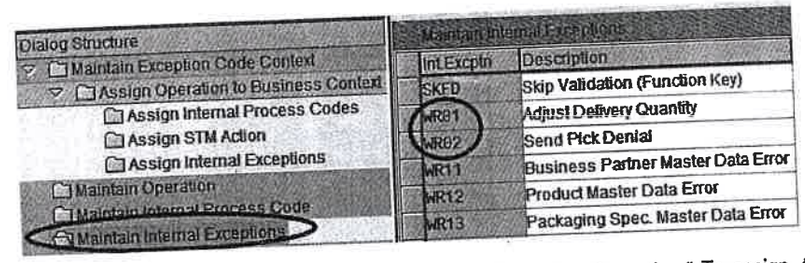
Next, the internal process code has to be assigned to the "Business Context". To assign, double-click on "Assign Operation to Business Context" in the dialog structure, select the appropriate step, and double-click on the "Assign Internal Process Codes" option in the dialog structure, as shown below.



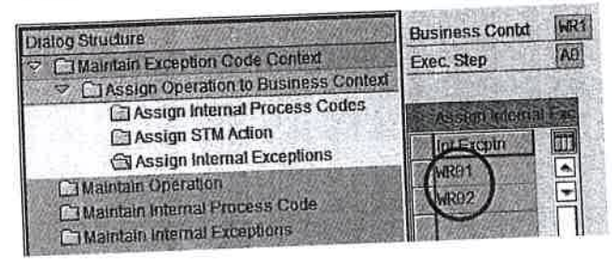


17.1.4 Maintain Internal Exceptions

Internal exception codes are automatically triggered when the system processes exception situations. SAP has predefined several internal exception codes in the EWM system.



Internal exception codes are assigned to "Business Context & Operation." To assign, first select the step line in "Assign Operation to Business Context," then click on "Assign Internal Process Exceptions."



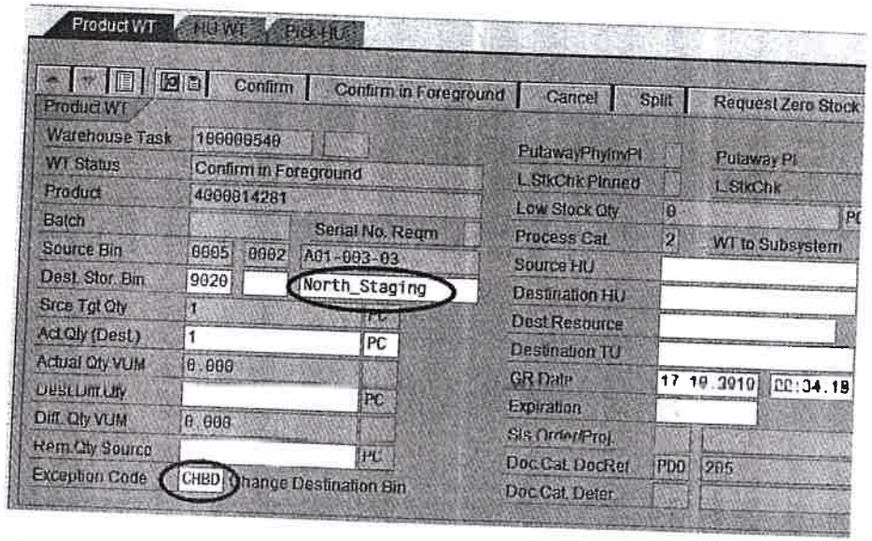
17.2 Exception Code

The exception code basically describes an exception situation in the warehouse. It provides advanced functionality to record and manage the exceptions that occur almost in every warehouse process. Table 17.2A shows an overview of configurations covered under the exception code definition.

S. No	Configuration Items	TCode	Transportable
1	Maintain Workflow Connection	SPRO	Yes
2	Display Active Workflows	SPRO	Yes
3	Create Exception Code	SPRO	Yes
4	Exception Code Profile	SPRO	Yes
5	Define Exception Code	SPRO	Yes
6	Maintain Process Parameters	SPRO	Yes
7	Delivery Adjustment in Case of Differences	SPRO	Yes
8	Maintain Follow-On Action (Workflow)	SPRO	Yes
9	Assign Internal Exception Codes to Exception Codes	SPRO	Yes
10	Assign Exception Code Profile to User	/SCWM/EXCUSERID	Yes

17.2A - Configuration Required to Define Exception Codes

For example, in the following screenshot, the picker wants to change the destination bin in the picking WT due to a last-minute change in the warehouse door assignment.

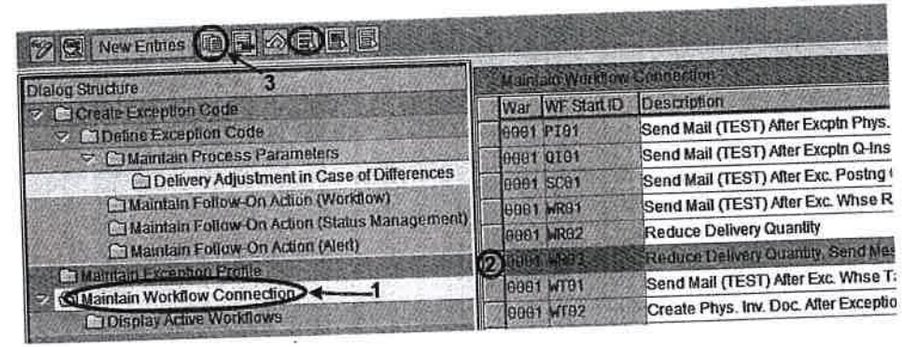


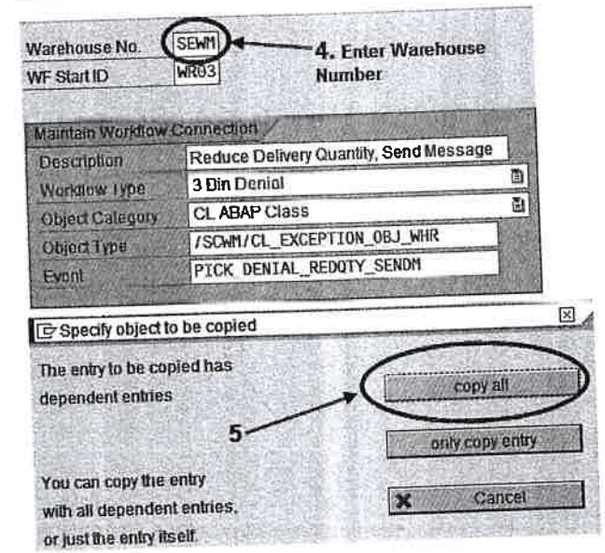
17.2.1 Maintain Workflow Connection

As explained earlier, in order to trigger the workflow, it is first necessary to define workflow connections. The connections defined here are warehouse specific. SAP has provided nine workflow connections. Users can copy them to their clients' warehouses, or they can define their own.

To copy the SAP-defined connection, click the "Maintain Workflow Connection" option in the dialog structure, click on "Select All Options," and then click the "Copy" option on the application toolbar. In the copy screen, change the warehouse number 0001 to the appropriate warehouse number. If there are any defined dependencies for the selected entry, the system will prompt the user before copying them. They can be copied automatically by selecting the "copy all" option.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Define Exception Codes

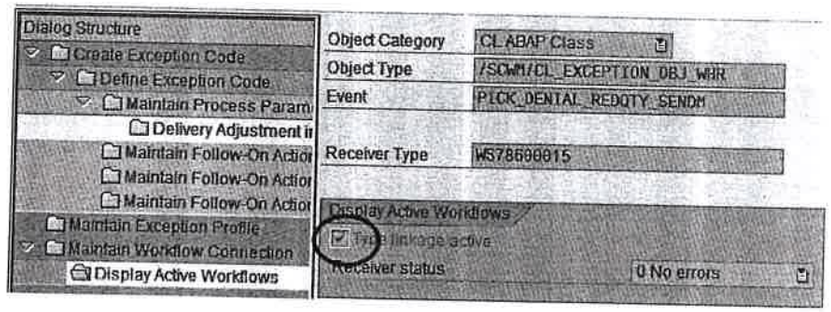




17.2.2 Display Active Workflows

In the dialog structure, select Maintain Workflow Connection; select the WF start ID, double-click on "Display Active Workflows," and verify that the "Type linkage active" check box is checked. This has to be checked to trigger the workflow. If the box is not checked, type linkage can be activated in TCode SWE2.

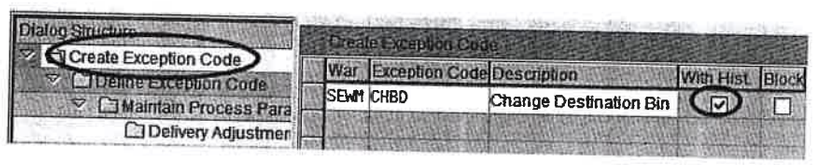
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Define Exception Codes or TCode SWE2



17.2.3 Create Exception Code

As of EWM 7.0, SAP has provided around seventy-five preconfigured exception codes and nine workflow connections, which can be copied to the user's warehouse. Users can also define their own exception codes and workflow connections. Exception codes defined in the system are warehouse dependent. To create an exception code, click on "New Entries" in the application toolbar. Check the "With Hist." check box. This saves the exceptions processed centrally and can be seen in the EWM monitor.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Define Exception Codes

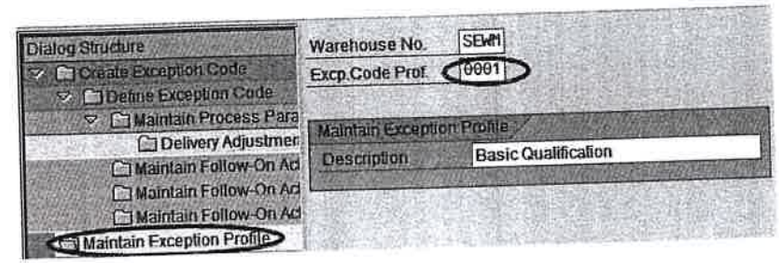


17.2.4 Exception Code Profile

Exception code profiles are used to restrict the availability of exception codes to a particular user.

In certain business scenarios, it may be necessary to prevent exception codes from being used by unqualified users. To do this, an exception code profile is assigned to each user. While executing the transaction with exception code, the system accesses the exception profile from the exception code and checks if this exception profile is assigned to the user.

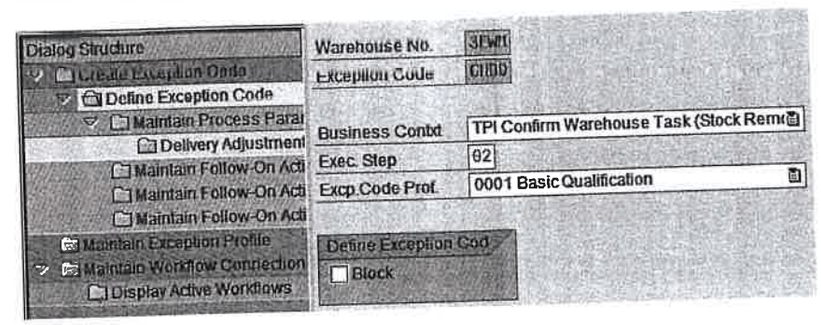
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Define Exception Codes



17.2.5 Define Exception Code

Here, the business context, execution step, and exception code profile are assigned to the exception code.

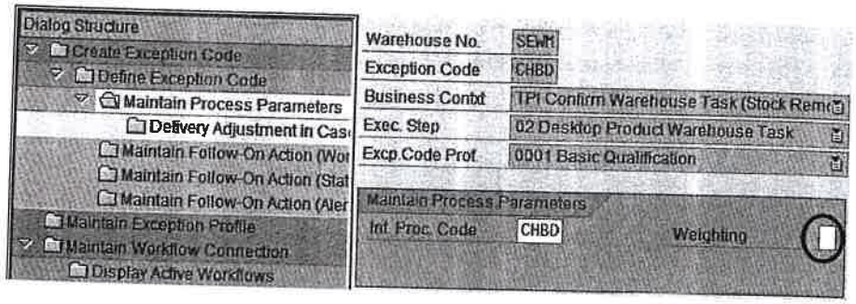
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Define Exception Codes



17.2.6 Maintain Process Parameters

Here, consultants can assign the internal process code, which was previously defined under "Maintain Business Context for Exception Codes." Weighting is used by the system to give priority to the exception code. Users can assign the value from 0, low priority, to 9, very critical.

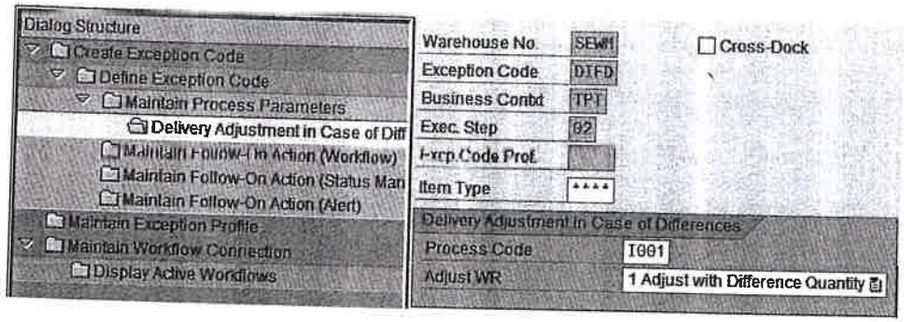
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Define Exception Codes



17.2.7 Delivery Adjustment In Case of Differences

If a delivery has to be adjusted with an exception code, the required settings must be made in the "Delivery Adjustment in Case of Differences" option.

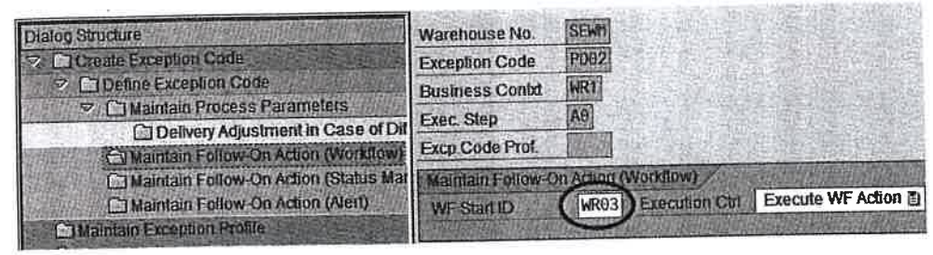
Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Define Exception Codes



17.2.8 Maintain Follow-On Action (Workflow)

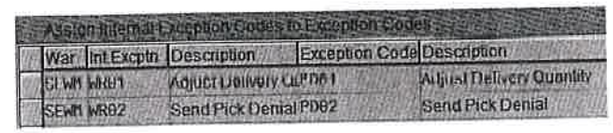
If the exception code requires workflow, assign the workflow start ID to the exception code.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Exception Handling | Define Exception Codes



17.2.9 Assign Internal Exception Codes to Exception Codes

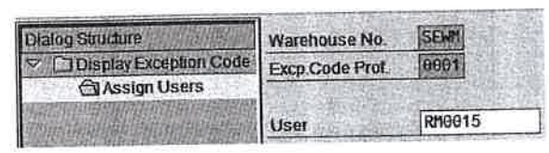
In "Assign Internal Exception Codes to Exception Codes" IMG activity, the relevant exception code is assigned to an internal exception code at the warehouse number level.



17.2.10 Assign Exception Code Profile to User

To use an exception code profile, it must be assigned to the users.

Menu path: SAP Easy Access | Extended Warehouse Management | Settings | Assign User to Exception Code Profile or TCode /SCWM/EXCUSERID



Summary

This chapter has explained how to configure exception codes. Chapter 16 demonstrated how to use exception codes during pick denial. Exception codes are mainly used at the time of outbound delivery processing or during PI.

Chapter 18: Post-Processing Framework (PPF)

The PPF is part of the SAP web application server. It is the successor to SAP's message control, which provides a wider functional scope, simpler connection to the applications, and greater flexibility. The greatest strength of the PPF is its flexibility. In general, it can be used to process different types of output types like printing, emailing, and faxing, or it can be used to trigger workflow, BADI, or follow-up actions.

In EWM, it is widely used in delivery processing, processing follow-up actions like automatic creation of WTs, posting of GRs and GI, and to print warehouse documents. This chapter explains the structure of PPF, process flow of PPF, and how to configure it, along with an example.

18.1 Process Flow of PPF

Diagram 18.1A explains the process flow of PPF.

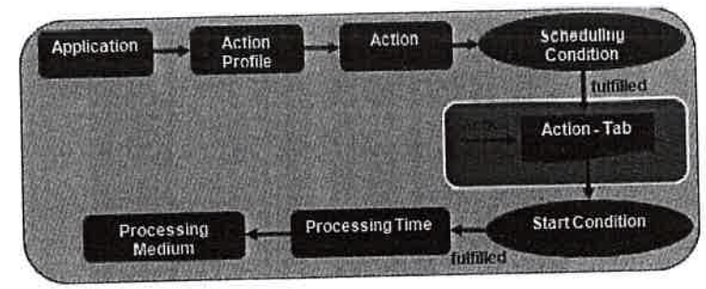


Diagram 18.1A – Process Flow of PPF

In the diagram:

- Application refers to the business transaction or process.
- Action profile contains the set of allowed actions with sequence of execution.
- Actions are generic business functions within a transaction. Actions define what to do (workflow/print), how to determine (condition techniques), when to process (on save/change), and how many times to process.
- Scheduling condition maintains the criteria for determining a particular action.

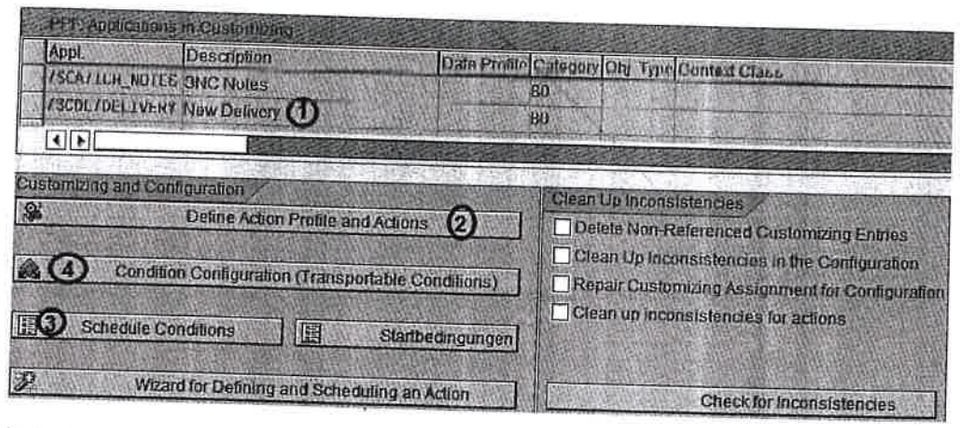
- The start condition is checked before the action is executed. The action is only executed when the start condition has been fulfilled. If no condition is defined, the system will consider that the condition is fulfilled.
- Processing time decides when a scheduled action is processed (immediately on saving application/through dialog).
- Processing mediums (types) are different ways the action is executed (call method, trigger workflow, smart form for print).

18.2 Configuration of PPF

Configuration for PPF actions can be done through respective application nodes in Customizing (example HU, WO) under menu path "Print" or in TCode SPPFCADM.

TCode SPPFCADM is mainly divided into three parts. They are applications, customizing, and cleanup inconsistencies. Under the application section, the PPF settings are defined for different transactions or processes. Action profiles and conditions are covered in detail later in this section.

In the following sections PPF settings are reviewed for a "New Delivery" application to give a better understanding of each of the PPF component.



To begin, select the application line item "New Delivery—/SCDL/DELIVERY" in the application section. Click on "Define Action Profile and Actions" button in customizing section. This will display the defined PPF action profiles and actions for the new delivery.

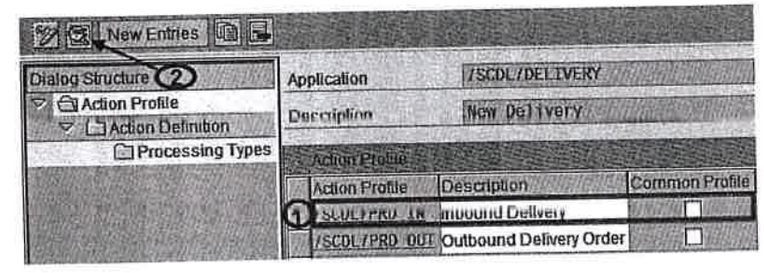
18.2.1 Action Profiles and Actions

An action profile contains the set of allowed actions with their sequence of execution and the settings required for all the action definitions.

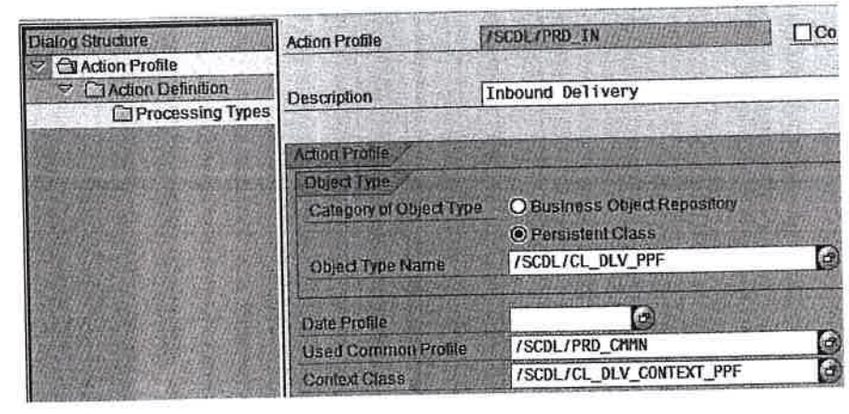
An action can be a function or a process that is scheduled for an application document under specific conditions and is started either immediately or later.

18.2.1.1 Action Profile

To see the action profile settings defined for the one of deliveries, select the "Action Profile" line and click on the "Details" button.



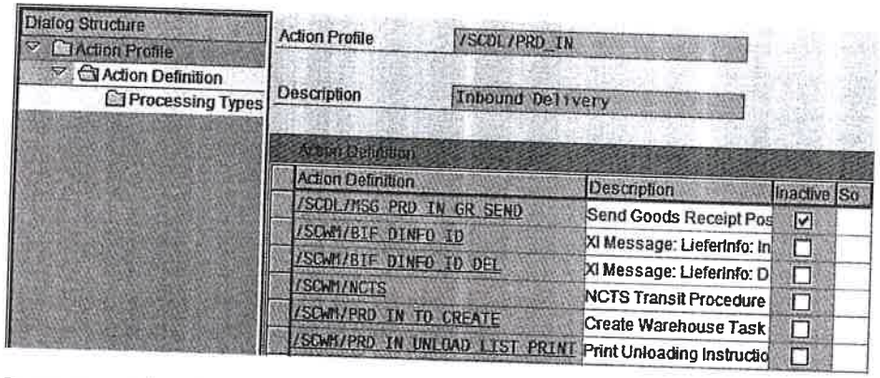
Here, category of the object type, the object type name, and the appropriate context class can be defined.



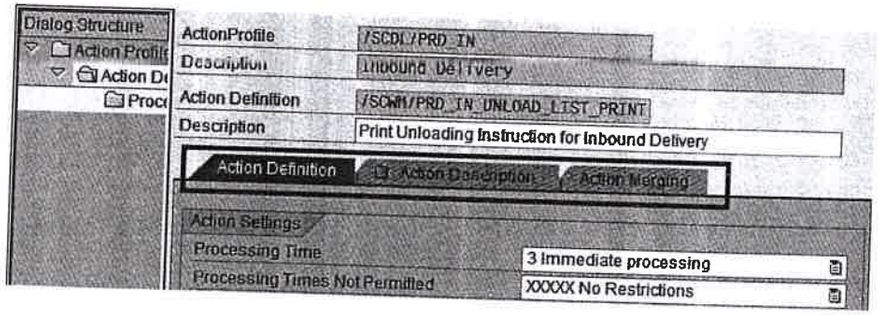
18.2.1.2 Action Definition

The action definition describes the content of an action independently of the processing type. It can be a function or a process that is scheduled for an application document under specific conditions and is started either immediately or later.

Actions can be determined both at the document header level and for single items. They can be performed in the background by the system, in foreground a user, or a group/organizational unit. The execution can either be started directly after the scheduling of the action or later. For example, actions might entail mail, fax, and so on.



To see the details of the action definition, select the action line item and click the "Details" button. This has three tabs.

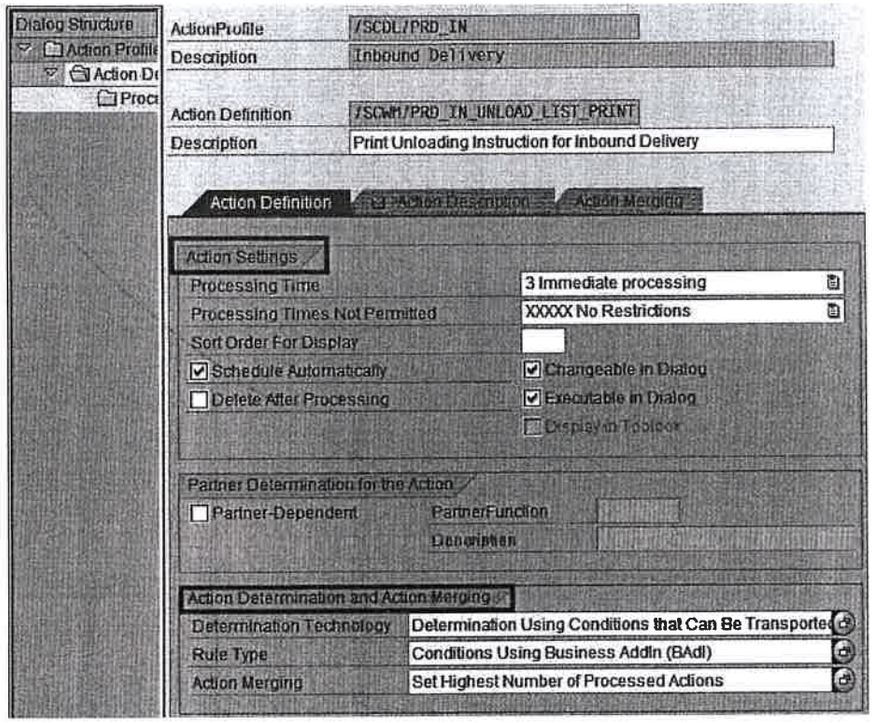


Under the "Action Definition" tab action settings, partner determination, and action determination need to be defined.

18.2.1.3 Action Settings

Under "Action Settings section" processing time, sort order, scheduling, and spool control can be defined.

The processing of an action can take place at different times. It can be started as soon as an action is scheduled—that is, after document posting—or it can be only scheduled initially. Processing can then be started later at a specific time, under specific conditions, or manually by a user.



18.2.1.4 Action Determination

"Determination Technology" checks whether the conditions for scheduling the actions have occurred. It generates proposals for actions when specific conditions occur. This can take place automatically or manually. In case of automatic determination, it takes place when the application document is saved after relevant changes. It uses the attributes of a business object to check whether the conditions for

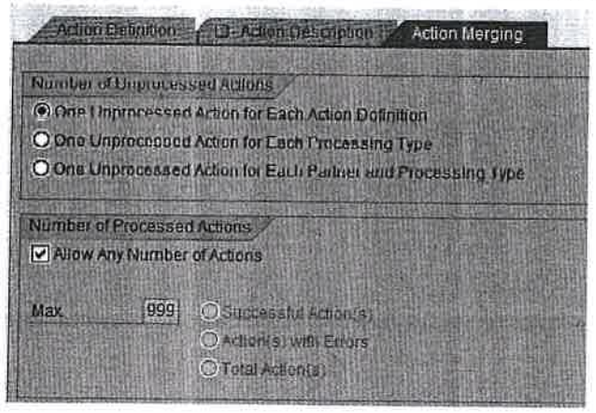
scheduling actions apply. The actions found are inserted into the action list according to the merging rule. The technology used for determination is specified per action definition.

Determination using conditions can be implemented in the following ways. The standard determination uses workflow rules.

- Workflow condition editor.
- Business add-in EVAL_SCHEDCOND_PPF.
- Manual determination: Actions can be created, changed, or deleted manually when editing the application document. A new action is then inserted into the action list, according to the merging rule. Manually created actions are not changed or deleted by automatic action determination.

18.2.1.5 Action Merging

Action merging is always necessary if existing, unprocessed actions have to be merged with newly found actions. This is done if an existing document is changed, for example. Because the data has changed, actions that were found when creating the document can be omitted, and the new actions, which have not yet been executed, are added to the action list or the work list.



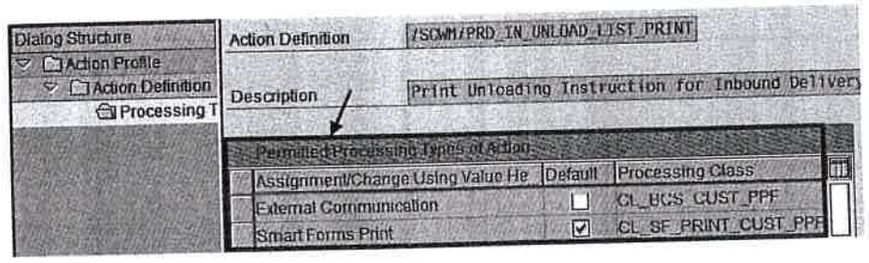
Under "Number of Unprocessed Actions" settings, the PPF provides several merge technologies but permits only one unprocessed action for each action definition, processing type, or partner and processing type. It covers the following situations:

- An action has been found and is not yet in the action list. It is inserted into the action list.
- An action has not been found but is in the action list. It is deleted from the action list and also from the database, if not changed manually.

- An action has been found but is already in the action list. If the existing action has not already been changed manually, the new action replaces the existing action.
- An action is executed a configurable maximum number of times. Any further actions found will not be executed.

18.2.1.6 Processing Type

Here, the processing type that is responsible for the execution of a particular action is defined. Examples include printing, faxing, sending, or starting a workflow.

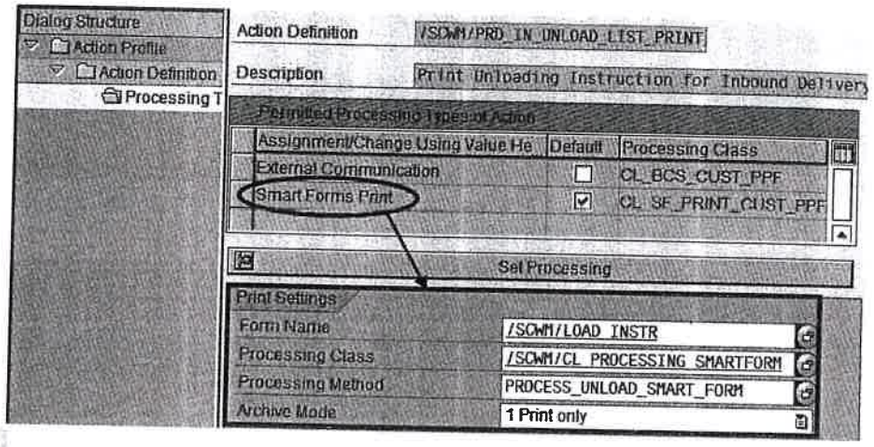


To add a new processing type, click the "New Entries" button, select the required item from the dropdown list in "Assignment/Change Using Value Help in List" and follow the steps. The dropdown list contains the following options:

- External Communication
- Method Call
- Smart Forms Fax
- Smart Forms Mail
- Smart Forms Print
- Trigger Alert
- Workflow
- XML Output of Confirmation
- XML Output of SA Release

For processing with method call, use the dropdown list to choose an appropriate method or BAdI. For workflow processing, enter a workflow template. For processing using Smart Forms, choose Smart Forms Print, Smart Forms Fax, or Smart Forms E-Mail and enter a form name, a processing class, and a processing method.

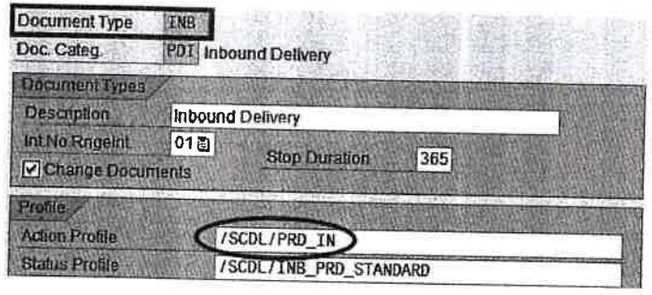
Depending on the selection, the system will display the required settings. For example, the following screenshot shows the print settings for process type "Smart Forms Print."



18.2.1.7 Assign Action Profile to Delivery Document Type

If the application is delivery, it is necessary to assign the action profile to the respective document type.

Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Receipt Process | Inbound Delivery | Manual Settings | Define Document Types for Inbound Delivery Process



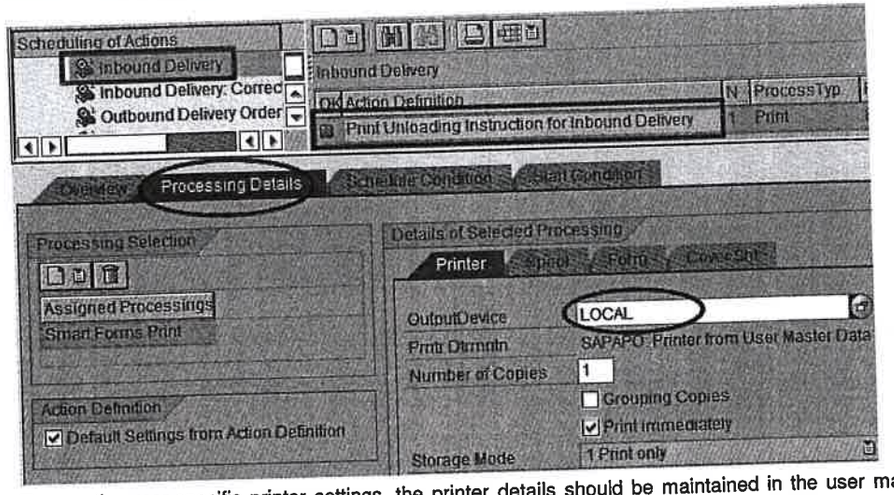
18.2.2 Maintain Condition Configuration

The next important configuration setting to trigger PPF is condition configuration. Either transportable or nontransportable condition configurations can be used.

The following example demonstrates how to maintain condition records to print unloading instructions for an inbound delivery.

In order to maintain condition records to print the unloading instruction, go to TCode SPPFCADM, select the application "New Delivery," and click on "Condition Configuration—Transportable Conditions."

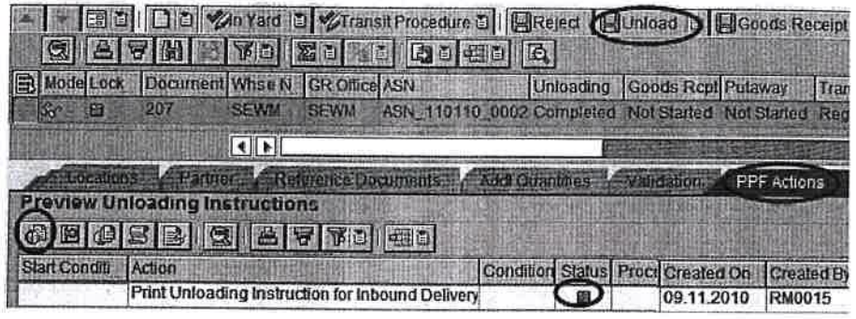
Under the action profile, double-click on inbound delivery; in the action definition section, double-click on "Print Unloading Instructions for Inbound Delivery." Here, a printer can be assigned to print the unloading instructions in the "Processing Details" tab. In order to maintain the values, transaction should be in the change mode.



To use the user-specific printer settings, the printer details should be maintained in the user master data. Either /SCDL/PPF_ADD_DATA or /SCWM/EX_DLV_PRINT_PROFILE BADI can be used to determine the printers as well.

To verify the configuration, go to transaction /SCWM/PRDI, enter the inbound delivery, and click on the "Unload" button. If the above settings are maintained, this will trigger the automatic printing of unloading instructions.

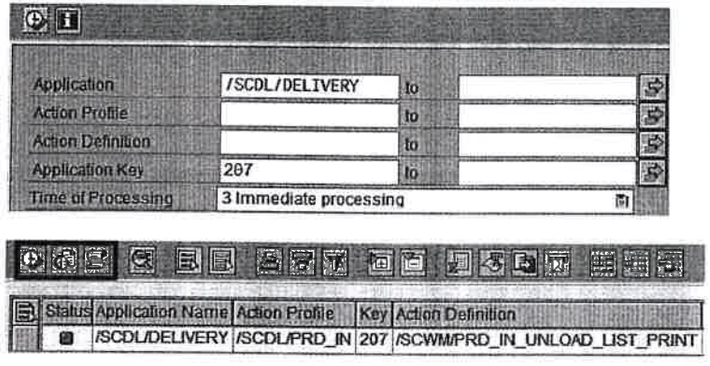
The processed documents can be previewed from the PPF action tab. The unloading instructions can also be reprinted and previewed from the PPF actions tab.



18.3 Processing of Outputs in EWM

TCode SPPFP makes it possible to manually process the outputs and to view all outputs that are scheduled, processed, or failed. Depending on user settings, previewing, printing, and reprinting the output can also be performed with this transaction.

Menu Path: SAP Easy Access | SAP Menu | Extended Warehouse Management | Delivery Processing | Actions | Process and Display PPF Actions or TCode SPPFP



18.4 PPF Connections—Diagram

Diagram 18.4A provides an overview of how PPF components are connected to other applications and how actions are processed in the PPF framework. These components were already explained earlier in this chapter.

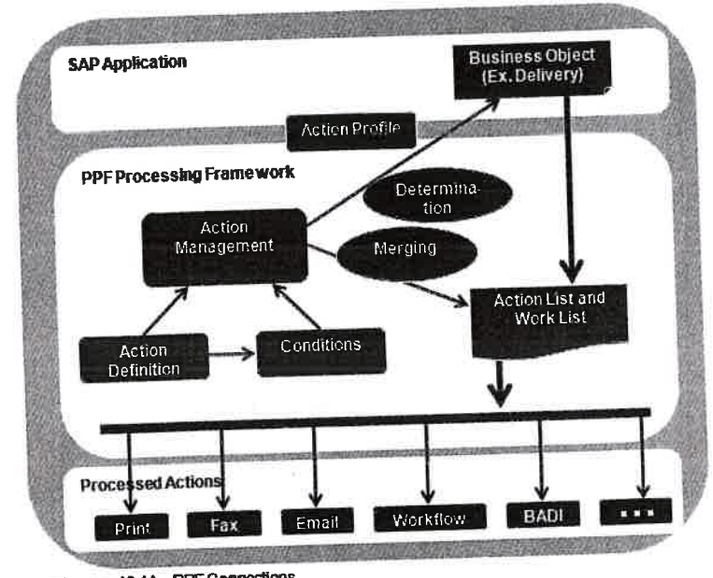


Diagram 18.4A – PPF Connections

Action List: Actions that have been scheduled by the determination for an application document are inserted in an action list. Users can display the action list and edit if required.

Work List: A work list contains actions that can be scheduled manually.

Notes:

i. In a few cases (like when printing a PI document, HU label, etc.), **the PPF configuration is more complex and requires additional configuration** like defining condition tables, access sequence, condition maintenance group, condition records, and so on. For easy understanding, this configuration is explained in detail in chapter 20, PI, under the "Print Physical Inventory Document" section.

ii. Depending on the PPF area, the following transaction may be useful and are available in the SAP easy access menu.

- /SCWM/PRHU5: Create Logical Conditions for Printing (HUs)
- /SCWM/PRWO5: Create Logical Conditions for Printing (Warehouse Orders)
- /SCWM/PRHU6: Create Condition Records for Printing (HUs)
- /SCWM/PRWO6: Create Condition Records for Printing (Warehouse Orders)
- /SCWM/PRPI_GCM: Create Condition Records for Printing (Physical Inventory)
- /SCWM/DLVPPFC: Maintain Condition Records for PPF Schedule Conditions
- /SCWM/PRT_CT_EXT: Enhance Print Condition Tables

Summary

This chapter explained what PPF is, why it is used, and how it can be configured in the EWM system. Because PPF is widely used in EWM, it is important for consultants to know how it works.

Chapter 19: Internal Warehouse Movements

Internal warehouse movements generally refer to PCNs, replenishments, and bin-to-bin transfers. Bin-to-bin transfers are also called as ad-hoc transfers. This chapter will discuss all three topics along with the configuration and example. By the end of each section, how to execute business transactions in each of these areas will also be explained.

19.1 Posting Change Notice (PCN)

PCN deals primarily with changes in information related to a warehouse stock, such as changing unrestricted stock to quality inspection stock, sales order stock to non-sales order stock, change in product or batch number, and so on. In most of these cases, the physical location of the stock doesn't change. It is only the status or the attributes of the stock that changes. In some cases, relabeling of the stock may be required in the warehouse. For all these stock status changes, EWM system creates a PCN document which needs to be processed to synchronize the stock between ERP and EWM system.

In the system, PCN can be triggered either from ERP or within EWM. Diagram 19.1A shows an overview of the process flow for PCN initiated in the ERP system.

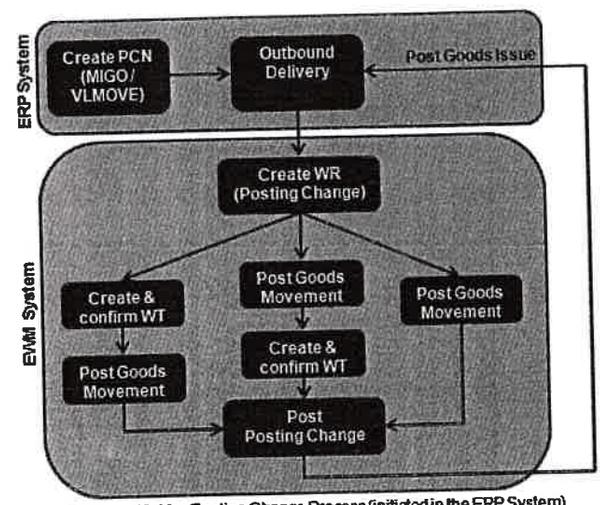


Diagram 19.1A – Posting Change Process (initiated in the ERP System)

In ERP, PCN can be initiated from various transactions. The most widely used transactions are "MIGO" for transfer posting, or "VLMOVE" for HUs. Both of these transactions will create an outbound delivery, which gets transferred to the EWM system and becomes a warehouse request document. In the warehouse, depending on the business requirements, the PCN-related warehouse request can be processed in three different ways.

- Create and confirm the WT, which will post the goods movement.
- First, post the goods movement and then create and confirm the WT for manual processing.
- Only post the goods movement. No WTs are created in this case.

The first two options are set up for manual processing, and the third option is completely automated. All these settings are triggered from the WPT. Only after the PCN document is processed in the EWM system, automatic goods issue will be posted for the outbound deliveries created in the ERP system.

On the other hand, a change can also be created directly in the EWM system. The goods movement for posting change created in EWM is communicated to the ERP system via the goods movement interface, as shown below.

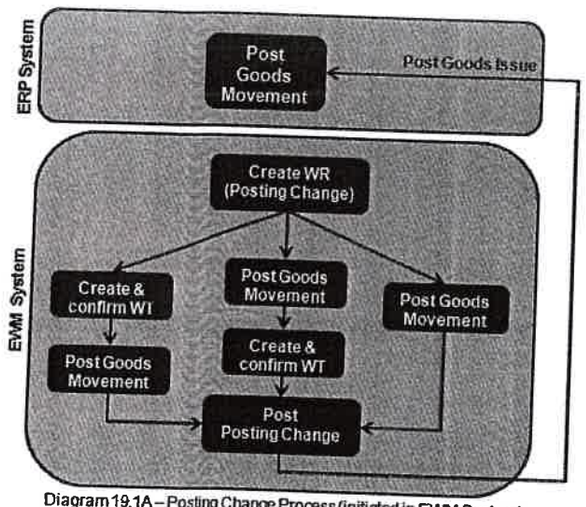


Diagram 19.1A – Posting Change Process (initiated in EWM System)

The following sections will discuss the configuration required for the PCN. Most of these configuration objects were already covered in detail in the earlier chapters. Hence, they will only be covered here with

a brief note for such objects and will provide a screenshot and the configuration path for easy understanding.

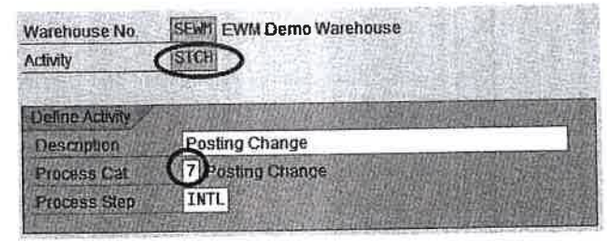
19.1.1 Activities and Activity Areas

Activities and activity areas are required to process the PCN. Separate activity areas can be defined for PCN, or only an activity can be created and assigned to the existing activity area. Details on activities and activity areas were covered in chapter 5.

▶ Define Activities

Here, new activity can be defined or SAP delivered activity 'STCH" can be used. In either cases the processing category for the activity should be "7—Posting Change."

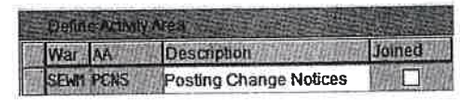
Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Activity Areas | Activities | Define Activities



▶ Define Activity Area

In the following example, a separate activity area has been created for PCN for easy understanding.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Activity Areas | Define Activity Area



▶ Assign Storage Bins to Activity Areas

Under this section, the bins are assigned to activity areas. Because the PCN can be posted in the same bin, all the bins must be assigned to PCN activity areas.

Activity Area									
War.	AA	Seq	Storage Type	Aisle Start	Aisle End	Level St	Level E	Bin	Bin
SEWM	PCNS	1		A	Z	1	10	01	99

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Activity Areas | Assign Storage Bins to Activity Areas

► Define Sort Sequence for Activity Area

Because the PCN is generally only a notice of status change, and the products are not moved from the bin, it is not required to assign a sort sequence for the activity area. However, if a business requires bin movements, a sort sequence can be defined for the activity area to sort the bins.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Activity Areas | Define Sort Sequence for Activity Area

Sort Sequence for Storage Bins							
War.	AA	Activity	Seq	Stor	Sort Seq	Sort Aisle	Sort Stack
SEWM	PCNS	STCH	1				

► Sort Storage Bins (TCode /SCWM/SBST)

If the sort sequence is defined for the PCN activity area, the bins for the activity area must be sorted.

WhN	Storage Bin	Activity	Seq. No.	AA	Typ	Section	Sort Seq
SEWM	A01-001-01	STCH	1	PCNS	0005	0001	1
SEWM	A01-001-02	STCH	1	PCNS	0005	0001	2
SEWM	A01-001-03	STCH	1	PCNS	0005	0001	3
SEWM	A01-001-04	STCH	1	PCNS	0005	0001	4
SEWM	A01-001-05	STCH	1	PCNS	0005	0001	5

19.1.2 Define Warehouse Process Type (WPT)

This section will cover the PCN-related settings required for the PCN-specific WPT. The standard SAP WPT for PCN is 4010.

Here, two important sections for PCN are "General Settings" and "Settings for Posting Changes."

Warehouse No. SEWM Whse Proc. Type 4010 Transfer Posting

Warehouse Process Type

General Settings

Whse Proc. Cat 7 — Manual WT Forbidden

Activity STCH — Confirm Immediately

Priority — Propose Confirmation

In the "General Settings" section, assign the warehouse process category as "7—Posting Change" and the activity defined for PCN.

In the "Settings for Posting Changes" section, the posting change bin setting, exception code, and the goods movement indicator, if the goods movement is posted before creating the WT can be defined.

"Posting Change in Bin" defines whether or not a WT should be created for PCN. If no inventory movement is required for the PCN, the value in this field must be blank. These settings can also be defined at the storage type level.

Settings for Postrlg Changes

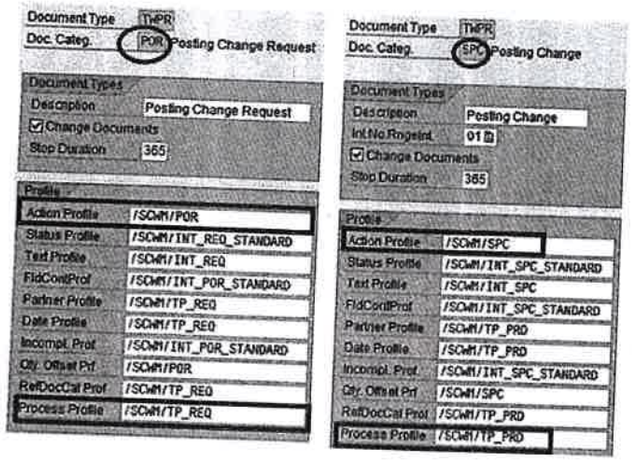
Post Change in Bin — Goods Mvmnt Before Warehouse Task

Exception Code

19.1.3 Define Document Types for Posting Change Process

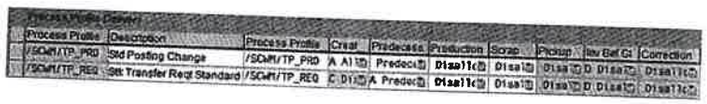
SAP has provided document type TWPR for posting change. The standard delivered document categories are POR for posting change request and SPC for the posting change.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Delivery Processing | Posting Changes | Manual Settings | Define Document Types for Posting Change Process



19.1.4 Process Profiles for Document Type

SAP has provided process profile /SCWM/TP_PRD for document category SPC and /SCWM/TP_REQ for document category POR. In the above menu, both of these categories are assigned to the document type TWPR. The processing profile describes how the processing of posting change request and posting change documents are controlled in the EWM system. The settings for process profiles can be viewed in menu path **SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Delivery Processing | Process Management and Control | Define Process Profile for Delivery Document Header**

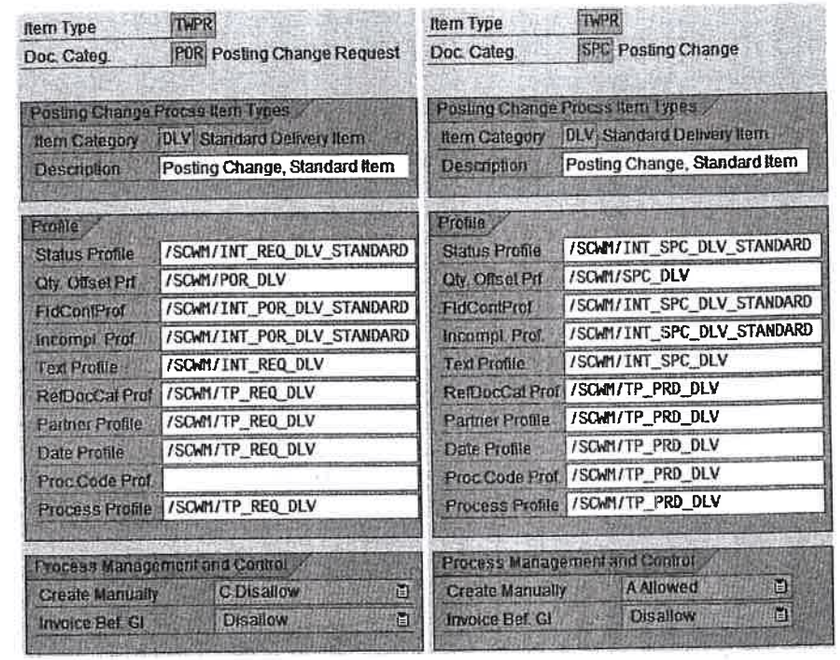


19.1.5 Define Item Types for Posting Change Process

In addition to the document type configuration, item types for posting change documents must also be defined.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Delivery Processing | Posting Changes | Manual Settings | Define Item Types for Posting Change Process

The SAP-delivered item type for PCN is TWPR, the document category for posting change request is POR, and the document category for posting change is SPC.



19.1.6 Map ERP Document and Item Type to EWM PCN Document Type

To get a posting change warehouse request document created in EWM for the ERP outbound delivery, the ERP document type and item type must be mapped to the EWM posting change document type.

Document types are assigned in menu path **SPRO | IMG | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Map Document Types from ERP System to EWM**

Mapping Delivery Type - Document Type

Business System	DocTypeERP	Cde Init. Com.	Doc. Type
	DTR		TWPR
	HTP		TWPR

In standard SAP configuration, two ERP document types (DTR and HTP) are assigned to EWM document type TWPR. No additional settings are required for these document types.

Item type mapping is done in menu path **SPRO | IMG | Extended Warehouse Management | Interfaces | ERP Integration | Delivery Processing | Map Item Types from ERP System to EWM**

Mapping of ERP Item Type

Busine	DocT	ItmTpERP	Doc.	Diff.A	CW Product	Item Type
	DTR	HSTP			☐	TWPR

19.1.7 Storage Type Search Sequence for Stock Removal

In order to determine the bin for PCN, it is necessary to assign a storage type search sequence to the WPT.

Menu Path: SPRO | Extended Warehouse Management | Goods Issue Process | Strategies | Determine Storage Type Search Sequence for Stock Removal

Determine Storage Type Search Sequence: Stock Removal

War	2	SRCl	Wh	Q	Stoc	Tpe	Use	H	HazRat2	Stor	Re
SEWM	☐	PICK	4010							PICK	

19.1.8 Determine Warehouse Process Type

In case of custom WPTs, the WPT must be assigned to the document type.

Menu Path: SPRO | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Determine Warehouse Process Type

Determination of Warehouse Process Type

War	Doc.	Item	Def.Prio.	ProTypeDet	Process Ind.	WhseP
SEWM	TWPR		0		No Special Pr	4010

19.1.9 Maintain Delivery-Relevant Data in the ERP System

To initiate the posting change process in the ERP system, customer and vendor details for the movement type must be maintained in the ERP system. If the customer and vendor records do not exist

for the plant, one dummy record can be created and transferred to the EWM system as a business partner. The ship-to party data defined here is used for outbound delivery, and the vendor number is used for inbound deliveries.

The configuration path to maintain vendor and ship-to party for the deliveries in the ERP system is **SPRO | IMG | Logistics Execution | Decentralized WMS Integration | Central Processing | Application | Define Interface to Inventory Management and Delivery-Relevant Data**

Here, double-click on "Delivery-Relevant Parameters for Reference Movement Type," locate the relevant movement types for posting change, and maintain the ship-to party and vendor number.

Delivery-Relevant Parameters for Reference Movement Type

W	R	S	M	S	Sp	S	Ship-to party	Delivery	Vendor	M	T	Creat	IM	Mail
EWM	321						1002845	DTR	1000030	321		☑		
EWM	321			B			1002845	DTR	1000030	321		☑		

19.1.10 Create Posting Change for Product in EWM

As discussed earlier, the posting change can be initiated either in the ERP system or in the EWM system. In the following example, it will be initiated in the EWM system.

To create a posting change document for a product, go to transaction **/SCWM/POST.** The menu path is **SAP Easy Access | SAP menu | Extended Warehouse Management | Work Scheduling | /SCWM/POST—Make Posting Change for Product**

In this transaction, users can create either a direct posting change or a posting change via a warehouse request. Changing the destination bin for PCN quantity is only possible with a warehouse request document.

Show | Find MATNR Product 4000014281

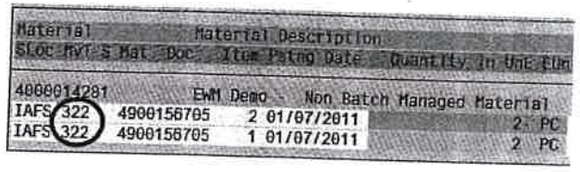
Create+Save | Create | Create+Save | Create

Source Bin	Product	AvlQty	QtyPostChg	AUn	WhseProTpe	Dest. Stor. Bin	ST	DST	Desc. Dest.Stk Type
A01-003-01	4000014281	2	2	PC	4010	A01-003-01	F2	Q4	Stock in Qi in Warehouse
A01-003-07	4000014281	5	0	PC			F2	F2	Unrestricted-Use Wareho

Once the posting change is posted in the EWM system, information for PCN will be transferred to the ERP system via the goods movement interface. In the ERP system, the system will select the

appropriate movement type to post the stock changes, based on the configuration, and will create a material document.

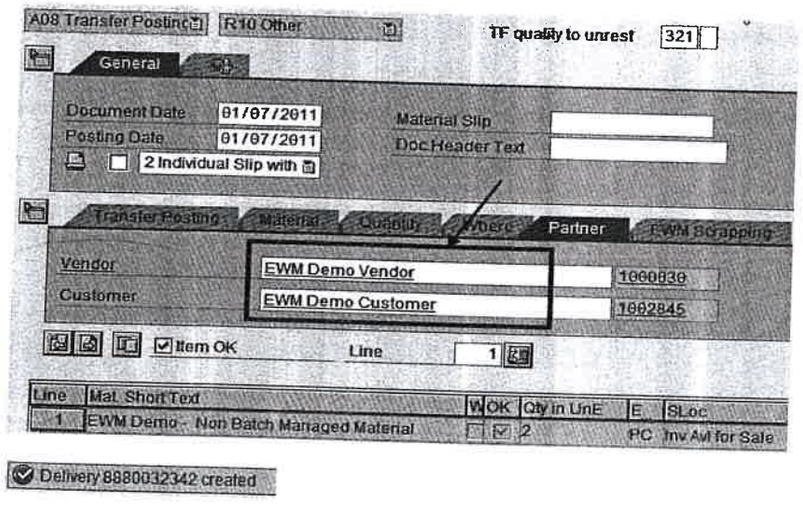
The following screenshot displays the material document posted in the ERP system for the stock change in the EWM system.



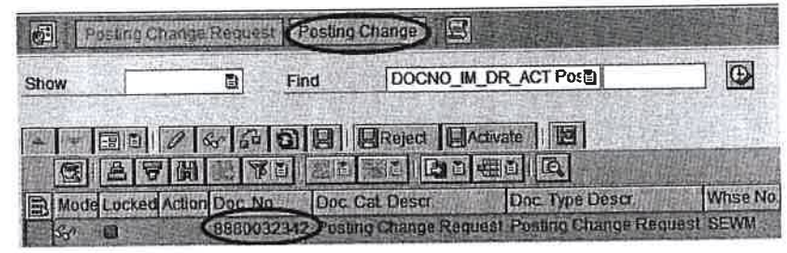
19.1.11 Create Posting Change for Product In the ERP System

Posting change can be initiated in the ERP from many transactions. The most widely used transactions are MIGO for transfer postings (without HU) and VLMOVE transaction for HU-related transfer posting. In case storage locations are EWM managed, the creation of posting change in the ERP system will trigger an outbound delivery and will be transferred to the EWM system. The standard delivery type for non-HU managed stock will be DTR; and for HU-managed outbound delivery, the delivery type will be HTP.

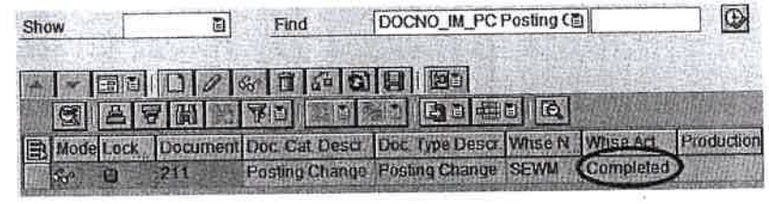
If the vendor and ship-to party data is not maintained in the configuration, users can manually enter these details in the MIGO transaction, as shown below.



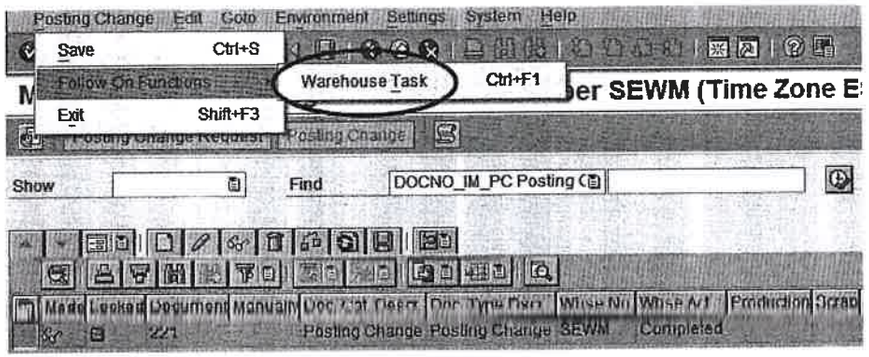
The delivery created in the ERP system will be transferred to the EWM system via qRFC. In the EWM system, it can be located in transaction **/SCWM/IM_DR** (menu path is **SAP Easy Access | SAP menu | Extended Warehouse Management | Delivery Processing | Posting Change | Maintain Posting Change Request**). Here, enter the ERP delivery number in the "Posting Change Requirement" field and click "Execute." This will display the posting change request document.



Select the document line and click the "Posting Change" button. This will create the posting change for the outbound delivery in the EWM system.



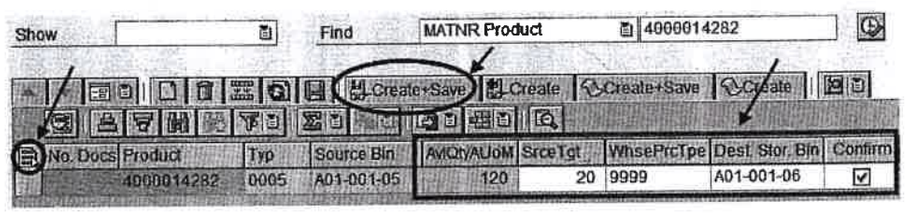
If the document is not processed automatically due to missing bin details, these details can be entered manually to process the document. To create WTs for PCN, the configuration must be set to create WTs, which can be created for the posting change document from menu path **Posting Change | Follow-On-Functions | Warehouse Task**



19.2 Ad-Hoc Stock Transfers

Ad-hoc stock transfers usually deal with the physical movement of products from one bin to another without a reference document. In the warehouse, this is also called bin-to-bin transfer. In EWM, TCode /SCWM/ADPROD can be used to transfer products and /SCWM/ADHU to transfer HUs.

Menu Path: SAP Easy access | SAP menu | Extended Warehouse Management | Work Scheduling | Create Warehouse Task without Reference | /SCWM/ADPROD—Move Product or /SCWM/ADHU—Move Handling Unit



In this transaction, users can display the bin stock for the products. In order to move the stock from one bin to another, select the line items where the products should be transferred from, enter the transfer quantity, enter the WPT (SAP delivered process type is 9999), enter the destination bin, and check the "Confirm" checkbox to confirm the WT immediately. Finally, click "Create + Save" to create the WT. This will transfer the stock between bins.

19.3 Replenishment

Replenishment is a warehouse process that is used to ensure that there is enough stock available for picking. In this process, the picking bins are filled from one or more reserve storage areas.

In EWM, there are four basic methods of replenishment:

- Planned Replenishment
- Automatic Replenishment
- Order-Related Replenishment
- Direct Replenishment

For each storage type allowed replenishment types can be defined.

Planned and Automatic Replenishment

In both planned and automatic replenishment methods, the system uses the minimum, maximum, and replenishment quantities from the product master to trigger the replenishment process. The only difference between these two methods is that the automatic replenishment is triggered during the WT confirmation, whereas the planned replenishment is triggered manually or scheduled in the background as a batch job. Common features of planned and automatic replenishment methods include the following:

- Calculates replenishment quantity, according to maximum and minimum quantity of the product master
- Only started when the stock figure gets lower than the minimum quantity
- Rounds down to multiples of minimum replenishment quantity

Order-Related Replenishment

This method takes into account all open warehouse request (WR) quantities for products. The features of order-related replenishment include the following:

- Can be started online or in batch mode
- Calculates replenishment quantity according to open WR quantity
- Started when stock is lower than the required quantity.
- Rounds up to multiple of minimum replenishment quantity

- Exceeding maximum quantity is possible

Direct Replenishment

Direct replenishment is triggered from the exception code during a pick denial and is only possible for fixed-bin scenarios. The exception code is configured with an internal process code that will trigger the replenishment of the product. This is also called picker-directed replenishment.

The main features of the direct replenishment are as follows:

- Started during a pick denial when exception code points to the internal process code "Replenishment"
- Only possible for fixed-bin scenarios
- Calculates replenishment according to maximum and minimum quantity
- Assumes that the bin quantity is zero at the time of pick denial
- Rounds down to multiples of minimum replenishment quantity
- Picker performs the replenishment

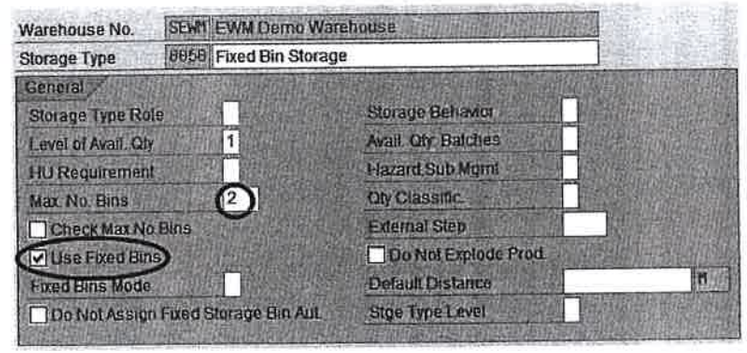
The following sections describe the configuration required for the fixed-bin replenishment process. The example will refer to a simple business scenario where a primary storage type (0050) is replenished from several reserve storage types.

19.3.1 Define Storage Type

To test fixed-bin replenishment, define a storage type for fixed bins. SAP has provided storage type "0050—Fixed Bin Storage type" in warehouse 0001.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Define Storage Type

In EWM, more than one fixed bin can be assigned per material. Under the general settings, enter the desired number of fixed bins per material and check the "Use Fixed Bins" check box.



Under replenishment settings, select an appropriate replenishment level. Replenishment level "1—At Storage Type" means the product replenishment will be based on the total quantity available in the storage type. In this case, the system will consider minimum and maximum quantities defined in the product master to calculate the replenishment quantity. Users can also choose to replenish stock for individual fixed bins based on the minimum and maximum data defined at the storage bin. In this case, select the "Storage Bin Level for Fixed Bins" replenishment level.

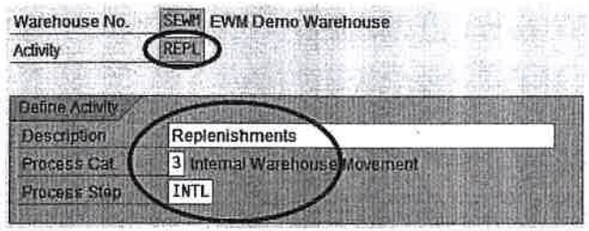
19.3.2 Verify Activities and Activity Areas

Activities and activity areas are required to process the replenishment. Separate activity areas can be defined for replenishment, or an activity can be created and assigned to an existing activity area. More details of activities and activity areas were covered in chapter 5.

▶ Define Activities

The standard SAP-delivered activity for replenishment is REPL. The processing category for this activity type must be assigned to "3—Internal Warehouse Movements."

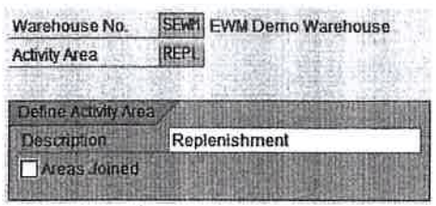
Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Activity Areas | Activities | Define Activities



► Define Activity Area

Here, an activity area called "REPL" has been defined for easy understanding.

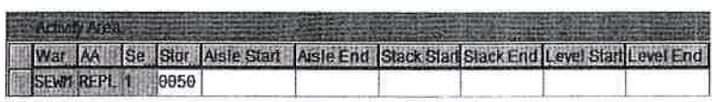
Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Activity Areas | Define Activity Area



► Assign Storage Bins to Activity Areas

In this section, bins are assigned to the activity areas for the replenishment process.

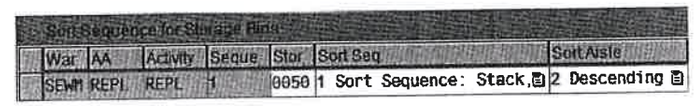
Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Activity Areas | Assign Storage Bins to Activity Areas



► Define Sort Sequence for Activity Area

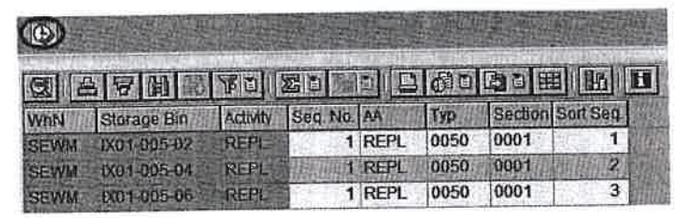
Here, the sort sequence for the activity areas can be defined.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Activity Areas | Define Sort Sequence for Activity Area



► Sort Storage Bins (TCode /SCWM/SBST)

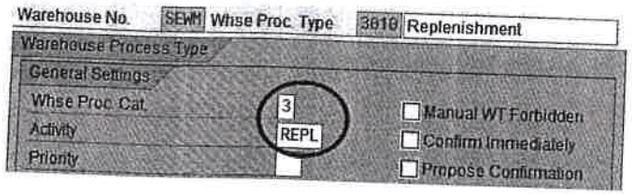
If the sort sequence is defined for the activity area, the bins must be sorted before performing the replenishment.



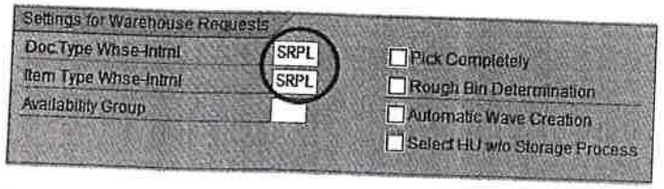
19.3.3 Define and Determine Warehouse Process Type

The predefined WPT for replenishment is "3010." Two important settings in this process type are the warehouse process category (i.e., "3—Internal Warehouse Movement") and the activity. Earlier chapters have already explained in WPT detail. The 3010 process type is available in SAP delivered template warehouse 0001 and can be copied the new warehouse.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Define Warehouse Process Type

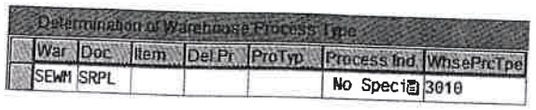


Under "Settings for Warehouse Request," verify the document and item types. The document and item types used for replenishment are "SRPL—Replenishment." They must be assigned to the warehouse process type. This document and item type is used when the warehouse request document created for the replenishment.



In order to determine the right WPT for replenishment, WPT must be assigned to the warehouse number and replenishment document type.

Menu Path: SPRO | IMG | Extended Warehouse Management | Cross-Process Settings | Warehouse Task | Determine Warehouse Process Type

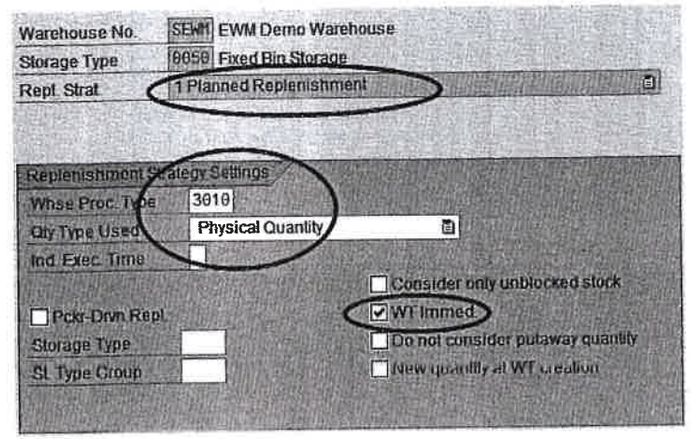


19.3.4 Activate Replenishment Strategies in Storage Types

The next important config step is activating the replenishment process for the storage types by assigning replenishment strategies. This menu defines the replenishment strategy, WPT, quantity type used, and WT creation settings for the storage type.

If the replenishment tasks are to be processed using wave functionality, the "WT Immed" check box should not be checked. The advantage of using wave functionality is that the replenishment-related wave can be released outside of peak picking hours. This might help the warehouse personnel manage their resources more effectively during peak hours.

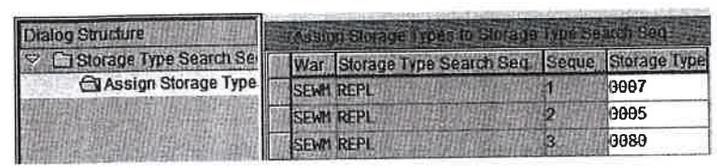
Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Replenishment Control | Activate Replenishment Strategies in Storage Types



19.3.5 Specify Storage Type Search Sequence

This IMG activity defines a storage type search sequence for replenishment. While defining storage type search sequence, be sure that the storage type defined for replenishment (for example, 0050) is not included in the search sequence.

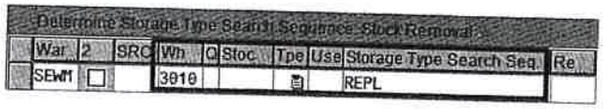
Menu Path: SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Strategies | Specify Storage Type Search Sequence



19.3.6 Determine Storage Type Search Sequence for Stock Removal

In order to determine the right storage type search sequence for replenishment, an appropriate entry must be made in the "Determine Storage Type Search Sequence for Stock Removal" table.

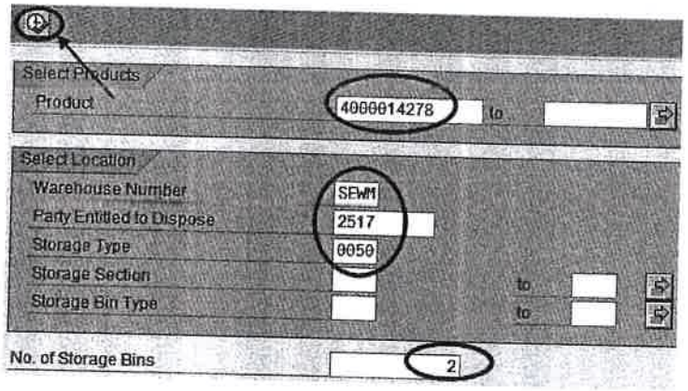
Menu Path: **SPRO | IMG | Extended Warehouse Management | Goods Issue Process | Strategies | Determine Storage Type Search Sequence for Stock Removal**



19.3.7 Maintain Fixed Storage Bin for a Product

For fixed-bin replenishment, the fixed bins must be maintained for products. In EWM, more than one fixed bin can be assigned under each storage type.

Menu Path: **Easy Access | SAP menu | Extended Warehouse Management | Master Data | Storage Bin | Assign Fixed Storage Bins to Products** or TCode **/SCWM/FBINASN**



The transaction "Maintain Fixed Storage Bin" (TCode /SCWM/BINMAT) can be used to view or change the settings of the fixed bins.

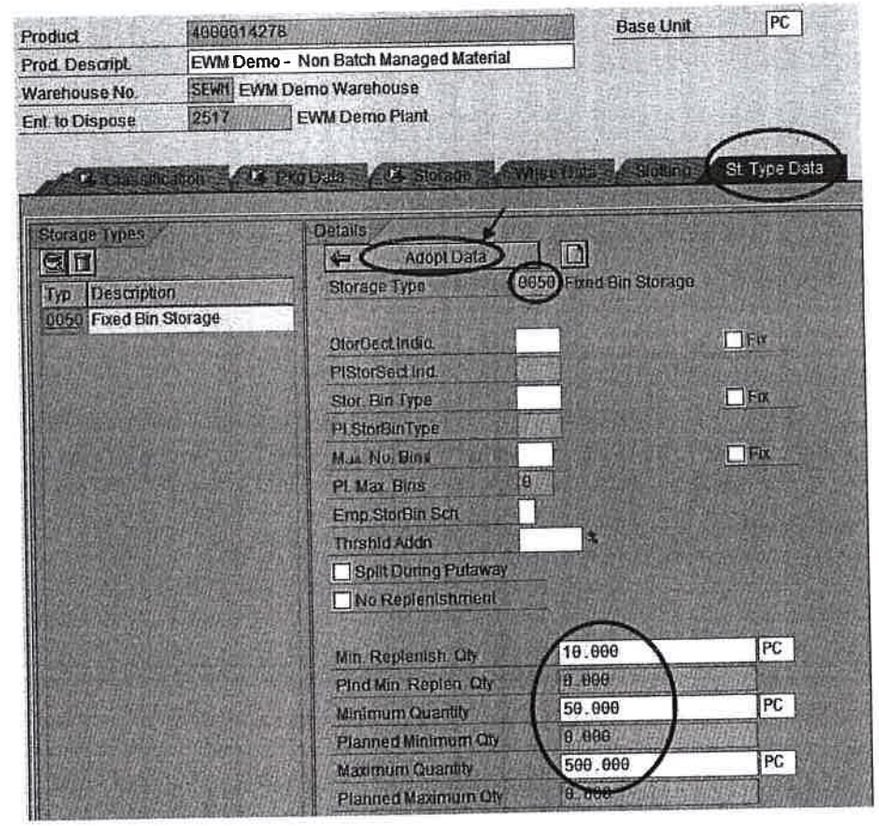
To delete the fixed bin assignments, go to transaction "Delete Fixed Storage Bin Assignment" (TCode /SCWM/FBINDEL).

19.3.8 Create Storage Type View for Product Master

Depending on the replenishment type and/or the storage type settings (i.e., if the storage type settings are configured to consider the minimum and maximum quantities from the product master to calculate the replenishment quantity), it may be necessary to define the minimum, maximum, and replenishment quantity data in the product master.

Menu Path: **SAP Easy Access | SAP menu | Extended Warehouse Management | Master Data | Product | Maintain Warehouse Product** or **TCode /SCWM/MAT1**

Here, click on the "Storage Type Data" tab; enter the storage type, minimum replenishment quantity, minimum quantity, and maximum quantity, and click on "Adopt Data."



This covers all the settings required for the planned replenishment that needs to be maintained.

19.3.9 Execute Planned Replenishment

Planned replenishment can be executed from TCode /SCWM/REPL. The menu path is **SAP Easy Access | SAP menu | Extended Warehouse Management | Work Scheduling | Schedule Replenishment**

In this transaction, select the "Planned Replenishment" option; enter the warehouse number, party entitled to dispose, and product numbers, and click "Execute." This will display the planned replenishment items for the entered criteria.

Whse No	Typ	Star Bin	Product	Kept Qty	Unit	WhsePrc Type	WT Immed.
SEWM	0050		4000014278	500	PC	3010	X

Select the line items and click "Execute." This will create a warehouse request or WT, depending on the configuration settings.

If the configuration is set only to create warehouse requests, use the transaction "Maintain Internal Stock Transfer" or TCode /SCWM/IM_ST to create a WT. Once the WT is created, verify the source bin, destination bin, and warehouse process type.

The TCode to confirm the WT is /SCWM/TO_CONF.

Summary

This chapter has explained posting change, ad-hoc stock transfers, and the different types of replenishment, along with the configuration and master data setup. The next chapter will cover PI in EWM.

Chapter 20: Physical Inventory (PI)

The PI process helps a company to keep control of the stock situation. Inventory needs to be kept track of for planning reasons, as well as because of legal requirements. In many companies, PI is mandated by the financial department or tax regulations, where the entire warehouse or all products must be inventoried at least once a year.

This chapter discusses in detail the process flow of the PI process, various PI procedures supported by EWM, and the configuration of PI methods. Here, consultants will also learn how to create PI documents, print count sheets, enter count results, and analyze and process of inventory differences in the EWM system. This chapter also covers how to use PPF functionality to print the PI document.

In EWM, physical inventory can be product specific or storage-bin specific. The difference between storage bin and product-specific counts is that in the storage-bin specific count, all of the products and HUs in that bin are counted; whereas in the product-specific count, particular products are counted that might exist in one or more bins or HUs. The product-specific count is used mostly for high-value products.

PI in EWM can be carried out for the following stock categories:

- Unrestricted stock in putaway
- Unrestricted stock in the warehouse
- Blocked stock in putaway
- Blocked stock in the warehouse
- Quality Inspection stock in putaway
- Quality Inspection stock in the warehouse

During the PI process, the relevant storage bins must be locked during the counting. However, this is not a requirement in the RF environment. As a prerequisite, at least one PI area must be created and assigned to the activity area.

In EWM, the warehouse is marked as completely inventoried once all the PI areas are counted. For product-specific inventory, a product is completely inventoried when all of the stocks of the product per physical inventory area and party entitled to dispose have been counted.

20.1 Physical Inventory Process Flow

PI documents contain the bins/products to be counted. They are usually created with inactivate status but can be activated at the time of document creation. In order to carry out the PI process, the PI document must be activated. The active PI documents can be printed using the PPF function and can be counted with or without RF framework.

After the initial count, a recount can be performed to determine any bins/products to be recounted. The recount selection can be based on value and/or quantity. After the inventory counting has been completed, the difference (if any) can be posted, completing the inventory process for that document. Diagram 20.1A provides an overview of the PI process flow in EWM system.

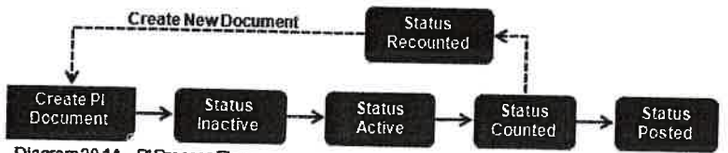


Diagram 20.1A – PI Process Flow

20.2 Physical Inventory Procedures

EWM supports the following three types of inventory procedures. All three can be implemented in the warehouse.

- Periodic Physical Inventory
- Continuous Physical Inventory
- Cycle Counting

20.2.1 Periodic Physical Inventory Procedure

Under this procedure, EWM supports both storage bin–specific annual PI and product-specific annual PI. Here, the stocks are counted on a certain day or within a fairly short period in this procedure. The stock movements can be blocked during this time.

20.2.2 Continuous Physical Inventory Procedure

This PI type is widely used in many warehouses and consists of the following inventory methods:

- Ad-Hoc Physical Inventory
- Low Stock Check

- Zero Stock Check
- Putaway Physical Inventory
- Storage Bin Check

20.2.2.1 Ad-hoc Physical Inventory

This is carried out at any time during the year to keep the physical bin stock in sync with the system stock. This method supports both product-specific as well as storage bin–specific inventory.

20.2.2.2 Low Stock Check

This is performed visually during WT confirmation, when the source bin contains only a small quantity after the stock removal. The low stock check is storage-bin specific. The quantity is defined in the form of a limit value that is based on the operative unit of measure for the product per storage type. The picker can check this stock level at a glance without having to do an explicit count. At the time of WT confirmation, picker can indicate that the low stock check has been executed in the RF or on the pick list. When the WT is confirmed, the system creates the PI document in the background on the basis of information in the WT.

20.2.2.3 Zero Stock Check (Storage-Bin Specific)

Zero stock check is a variant of the low stock check, with the limit value set as zero.

20.2.2.4 Putaway Physical Inventory (Storage-Bin Specific)

This is also similar to low stock check, but it occurs only at the time of putaway. It is carried out at the time of first putaway in the bin in the fiscal year. Here, the warehouse operator confirms during the first putaway that the stock in the storage bin matches the confirmed quantity in the WT after putaway. The system checks for the following conditions in this case:

- The storage bin is empty
- The stock is being putaway in the storage bin for the first time in the PI year
- Mixed storage is not permitted for the relevant storage type

If all conditions are met, the storage bin quantity becomes the same as WT quantity, and the system creates a PI document.

20.2.2.5 Storage Bin Check

Here, the actual stock of a product is not counted; instead, the operator checks whether or not a product is actually stored in the right storage bin. In many warehouses, this is not considered a PI method.

20.2.3 Cycle Counting Procedure

This is an inventory procedure in which only a small subset of stock is counted each day. It is an ongoing inventory procedure and is less disruptive than annual inventory, where the whole warehouse is counted within a short time frame.

EWM supports product-specific cycle counting. In cycle counting, the PI is carried out for products at regular intervals during a fiscal year. Here, the products are assigned to different classes (A, B, C, D, etc.), and the counting intervals for PI are assigned to these classes. This procedure allows fast-moving products to be counted more frequently than the slow-moving ones. The cycle counting indicator is maintained in the product master in the warehouse data view tab.

20.3 Physical Inventory Configuration

This section explains the required configuration and how to perform the basic PI transactions in the EWM system.

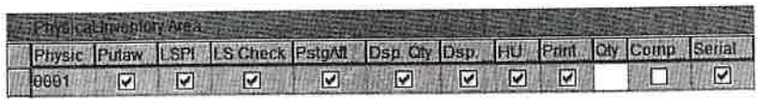
20.3.1 Define Physical Inventory Area

Physical inventory areas are defined first before doing any customizing settings for PI to specify whether:

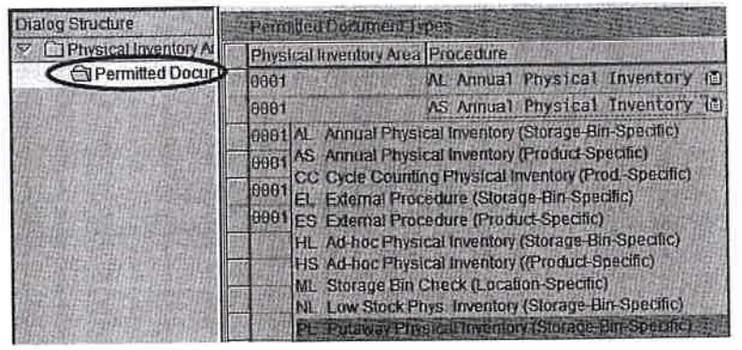
- a putaway physical inventory is allowed (once per PI period)
- a low-stock/zero-stock physical inventory is allowed (once per PI period)
- a low-stock/zero-stock check is to be carried out when the WT is confirmed
- the document is to be posted automatically after the count (this depends on the user's allowed tolerance values)
- the book inventory is to be proposed at the time of the count and at the time of printout (does not apply to radio frequency environments)
- the product data is proposed for the storage-bin- specific physical inventory
- it is allowed to count a handling unit as complete
- the product data is included in printouts
- a serial number to be suggested when count results are entered

- Quantity threshold value for low-stock physical inventory or zero stock should be entered in the quantity field. If the value entered is zero, a zero check is triggered; otherwise, a low stock check is triggered. The unit of measure necessary to trigger the low-stock check is determined from the packing instructions

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Physical-Inventory-Area-Specific Settings | Define Physical Inventory Area



Once the PI Area is defined, in the dialog structure, double-click on "Permitted Document Types" and specify what types of PI procedures are allowed for the PI area. There can be more than one permitted document type for the PI area.



20.3.2 Configure Activities and Activity Areas

The following configuration has to be made in order to define a separate activity area for PI. For demonstration purposes, activity PHYS has been defined here. As the following topics have been covered several times in earlier chapters, they will not be covered in more detail here. All config items are located under menu path **SPRO | IMG | Extended Warehouse Management | Master Data | Activity Areas**

- **Define Activities**

Warehouse No.	SEWM	EWM Demo Warehouse
Activity	PHYS	

Define Activity	
Description	Physical Inventory Movement
Process Cat.	4 Physical Inventory
Process Step	

- **Define Activity Area**

Define Activity Area

War.	AA	Description	Joined
SEWM	PHYS	Physical Inventory	☐

- **Assign Storage Bins to Activity Areas**

Activity Area

War.	AA	S.	Stor.	Aisle Start	Aisle End	Stack Start	Stack End	Level Start	Level End	Bi	Bin S
SEWM	PHYS	1		A	Z			1	10	01	99

- **Define Sort Sequence for Activity Area**

Sort Sequence for Storage Bins

War.	AA	Activity	Se.	Stor.	Sort Seq.	Sort Aisle	Sort Stack	Dir. Stack	Sort Level	PthDir.
SEWM	PHYS	PHYS	1							

- **Sort Storage Bins (TCode /SCWM/SBST)**

WhN	Storage Bin	Activity	Seq. No.	AA	Typ	Section	Sort Seq.
SEWM	A01-001-01	PHYS	1	PHYS	0005	0001	1
SEWM	A01-001-02	PHYS	1	PHYS	0005	0001	2
SEWM	A01-001-03	PHYS	1	PHYS	0005	0001	3
SEWM	A01-001-04	PHYS	1	PHYS	0005	0001	4

20.3.3 Periodicity of Storage Bin Check

This sets the interval in work days, according to which a new PI is to be executed along with the buffer time in work days. Menu path is **SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Physical-Inventory-Area-Specific Settings |Periodicity of Storage Bin Check**

Storage Bin Check

War.	AA	Int.	BT
SEWM	PHYS	30	5

20.3.4 Assign Physical Inventory Area to Activity Area

PI can be performed once PI area has been assigned to an activity area. Menu path is **SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Assign Physical Inventory Area to Activity Area**

Assign Physical Inventory Area to Activity Area

Ware.	AA	Physical Inventory Area
SEWM	PHYS	0001

20.3.5 Define Number Ranges for Physical Inventory Documents

In the system, each PI document is uniquely identified with the document number. The system assigns the number to the PI document from the number ranges defined for PI documents.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Define Number Ranges for Physical Inventory Documents

NR Object	WME Phys. Inv. Doc

Intervals

No.	Year	From number	To number	Current number	Ext.
01	2016	0000000000007000000000	0000000000007999999999	0	☐

20.3.6 Specify PI-Specific Settings in the Warehouse

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Specify Physical-Inventory-Specific Settings in the Warehouse

Physical Inventory-Specific Settings in Warehouse

War	Currncy	Cal	Fis	Procedure	Owner	Party to Disp	Corr Perm	Allowed P	No Tol	NRI PI
SEWH	USD	US	12	ZPIPRC	☑	☑	☑	1.00	☐	01

For each warehouse number, the following should be specified:

- **Currency unit to use**

  The currency unit is used in the calculation of the product value. The product values are used in the tolerance level checking during inventory counting and clearing. They can be transferred from ERP to EWM system manually in transaction /SCWM/VALUATION_SET. The menu path is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Periodic Processing | Determine and Set Process from ERP.**

  The values stored in the EWM system are used only for reference. If the values are changed in the ERP system, they have to be manually updated in the EWM system.

- **Factory calendar to use**

  The factory calendar is used to distinguish between working and nonworking days. This is required for cycle counting to calculate the intervals in working days to determine when the next count is scheduled.

- **Period (fiscal year) to use:** The fiscal year period is usually defined by the APO and FICO consultants.

  Menu Path SPRO | IMG | Advanced Planning and Optimization | Supply Chain Planning | Service Parts Planning (SPP) | Basic Settings | Maintain Fiscal Year Variants.

  The following is an example for fiscal year having four special periods.

Dialog Structure
- Fiscal year varia
  - Periods
  - Period texts
  - Shortened Fi

Fiscal year variants

FV	Description	Year-depend	Calendar yr	Number of post	No.of special periods
12	EWM Demo	☐	☑	12	4

Dialog Structure
- Fiscal year varia
  - Periods
  - Period texts
  - Shortened Fi

Fi.Year Variant 12 EWM Demo 12 pds
No.posting periods 12 No.special periods 4
☐ Year-dependent ☑ Calendar year

Period texts

Language	Period	Txt	Text
EN	1	JAN	January
EN	2	FEB	February
EN	3	MAR	March
EN	4	APR	April
EN	5	MAY	May
EN	6	JUN	June
EN	7	JUL	July
EN	8	AUG	August
EN	9	SEP	September
EN	10	OCT	October
EN	11	NOV	November
EN	12	DEC	December
EN	13	SP1	Special period 1
EN	14	SP2	Special period 2
EN	15	SP3	Special period 3
EN	16	SP4	Special period 4

- **Determination procedure:** refers to the condition procedure for printing. Here, the "ZPIPRC" procedure has been defined, and the details are covered in section 20.3.17 under "Print Physical Inventory Document—PPF Action."
- **Number Range for PI documents:** used to generate unique number to the PI document.
- **Owner/Party Entitled to dispose:** if these parameters are selected, the owner and the party entitled to dispose are proposed in the PI count.
- **Correction Permitted:** This parameter should be selected if corrections to a PI document in the difference analyzer are to be allowed after the count has been posted.
- **Allowed Percentage and No Tolerance Check:** Here, a certain percentage of tolerance limits can be specified during the counting, which is used to prompt a warning message to the user to validate the entered count if necessary.

20.3.7 Configure Cycle Counting

For cycle counting, the following values must be maintained for each warehouse number.

- The cycle counting Indicator

- The interval in work days after which a new PI should be performed
- The buffer time in work days

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Configure Cycle Counting

Cycle Counting Counting Cycle

War	CC Ind.	InPI	BT
SEWM	A	30	5
SEWM	B	60	5
SEWM	C	90	5

20.3.8 Define Tolerance Group for Difference Analyzer

In this IMG activity, a value-based tolerance group can be defined for the difference analyzer. A later section will demonstrate how to assign this to users.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Define Tolerance Groups | Define Tolerance Group for Difference Analyzer

Definition of the Tolerance Group Difference Analyzer

War	TolGr Diff. Ana	Value-Based Tolerance	Currncy	No Tol.	Wait Time
SEWM	HIGH	10,000.00	USD	☐	
SEWM	LOW	1,000.00	USD	☐	
SEWM	MEDIUM	5,000.00	USD	☐	

20.3.9 Assign User to Tolerance Group for Difference Analyzer

Here, tolerance groups are assigned to users for the difference analyzer.

Menu Path: SAP Easy Access | SAP Menu | Extended Warehouse Management | Settings | Physical Inventory | Assign User to Tolerance Group for Difference Analyzer

Warehouse No. SEWM

Assignment of User to Tolerance Grou

User	TolGr Diff. Ana.
RH0815	HIGH

20.3.10 Define Value Based Tolerance Group for Posting Differences

In this IMG activity, define value-based and quantity-based (percentage) tolerance values for each group for posting differences.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Define Tolerance Groups | Define Tolerance Group for Posting Differences

Definition of Tolerance Group: Post Differences

War	Tol. Group Po	Allowed Perc	No Tol.	Value-Based Tol.	Currncy	No Tol.	Alert Flag
SEWM	HIGH	50.00	☑	10,000.00	USD	☐	☐
SEWM	LOW	10.00	☑	1,000.00	USD	☐	☐
SEWM	MEDIUM	25.00	☑	5,000.00	USD	☐	☐

20.3.11 Define Tolerance Group for Recounting

In this IMG activity, for each warehouse number, define the PI tolerance groups for recounting, and assign value-based and quantity-based (percentage) tolerance values to these.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Define Tolerance Groups | Define Tolerance Group for Recounting

Definition of Tolerance Group: Recount

War	Tolerance Gro	Allowed Percen	No Tol.	Value-Based Tol.	Currncy	No Tol.
SEWM	HIGH	100.00	☐	10,000.00	USD	☐
SEWM	LOW	10.00	☐	1,000.00	USD	☐
SEWM	MEDIUM	50.00	☐	5,000.00	USD	☐

20.3.12 Assign User to Tolerance Group for Recount/Clearing

Here, the previously configured tolerance group for recount and clearing differences are assigned to the users.

The menu path is SAP Easy Access | SAP Menu | Extended Warehouse Management | Settings | Physical Inventory | Assign User to Tolerance Group for Recount/Clearing

Warehouse No. SEWM

Assignment of User to Tolerance Group Posting and Recounting

User Name	AA	Tol. Group Po	Tolerance Gro
RH0815	PHYS	HIGH	LOW

20.3.13 Define Priorities

Priorities control the urgency of a PI document or an occurring difference in the system. PI documents having the greatest urgency are assigned the highest priority. The priorities must be defined for each warehouse. In EWM, a maximum of nine different priority values is possible.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Reason and Priority | Define Priorities

Definition Table of Priorities

War	Priority	Prio Descrip.
SEWM	1	HIGH
SEWM	2	MEDIUM
SEWM	3	LOW

20.3.14 Define Reason for Physical Inventory

PI reason is used to control different tasks within the PI process. Priority is assigned to each reason.

Reason for Physical Inventory

War	Reason	Description	Priority	PIL	Autom.	Active	No CW Qty
SEWM	CCIV	Cycle Counting	2	☐	☐	☐	☐
SEWm	LSPI	Low Stock Check	1	☐	☐	☑	☐
SEWM	PTPI	Putaway Physical Inventory	2	☐	☐	☑	☐
SEWM	STND	Standard Physical Inventory	2	☐	☐	☐	☐
SEWm	UNAS	Not Assigned	3	☐	☐	☐	☐
SEWm	UPLD	Unplanned Physical Inventory	1	☑	☐	☑	☐

- **PIL (product in location) indicator** is used to define whether the PI document can be ended with an exception during counting; that is, whether internal exception PRIL (standard PI with product in location) is permitted.

- **Automatic indicator** is used to define whether differences in PI are allowed to post in the difference analyzer immediately to the ERP system as a background job. If the indicator is not set, automatic posting is allowed.
- **Active indicator** is used to define whether PI documents should be activated at the time of creation.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Reason and Priority | Define Reason for Physical Inventory

20.3.15 Define Reason for Differences

Four types of differences can be assigned to each process, along with the reason and priority. They are as follows:

- Difference for a WT
- Change in difference for a PI document (COR)
- Difference for a receivable from a sales order (CO)
- Difference for a receivable from a stock transfer (STO)
- Difference for an inspection document (QI)

These values are used when displaying differences in the difference analyzer and during reporting.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Reason and Priority | Define Reason for Differences

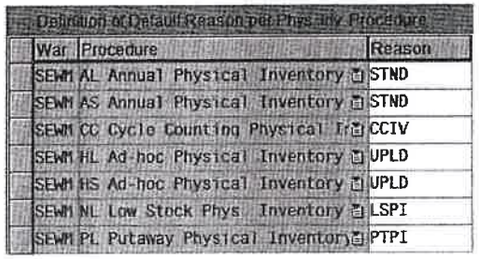
Reason of Difference

War	Process	Reason	Description	Priority
SEWM	CO Pending Claim from Sales Order	CUCL	Customer Claim	1
SEWM	COR Correction of a Difference	CORR	Correction	3
SEWM	QI Inspection Document	QIDF	Inspection Document	3
SEWM	STO Pending Claim from Stock Transf	STOC	Stock Transfer	1
SEWM	WT Warehouse Task	WTDF	Warehouse Task	3

20.3.16 Define Standard Reason for Each PI Procedure

When the PI document is created reason code must be assigned. If no reason code is specified, the PI document is created with the standard reason code from the PI procedure. Therefore standard reason code must be assigned to every PI procedure.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Warehouse-Number-Specific Settings | Reason and Priority | Define Standard Reason for Each Phys. Inv. Procedure



War	Procedure	Reason
SEWM	AL Annual Physical Inventory	STND
SEWM	AS Annual Physical Inventory	STND
SEWM	CC Cycle Counting Physical I	CCIV
SEWM	HL Ad-hoc Physical Inventory	UPLD
SEWM	HS Ad-hoc Physical Inventory	UPLD
SEWM	NL Low Stock Phys. Inventory	LSPI
SEWM	PL Putaway Physical Inventory	PTPI

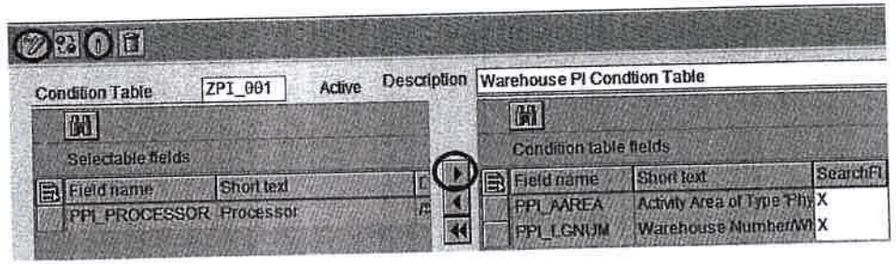
20.3.17 Print PI Document—PPF Action

Chapter 18 already covered how to print documents using PPF. This section will demonstrate how to use functionalities (like condition types, access sequence, condition records, etc.) to print the PI document along with the PPF action profile.

20.3.17.1 Create condition table

A condition table defines the combination of fields (the key) that identifies an individual condition record. A condition record is how the system stores the specific condition data entered in the system as condition records.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Print | Create Condition Table



To create a condition table, click the "Change" button, enter the condition table name, description, and click the "Enter" button.

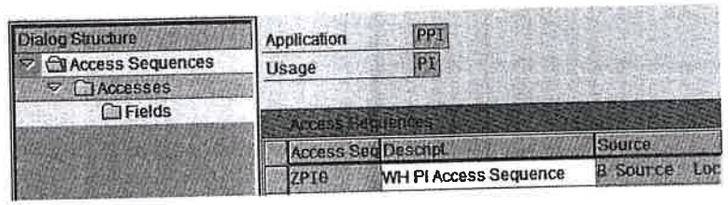
In the selectable fields section, select the desired fields to add them to the condition table and click on the right arrow key. This will add the selected fields to the condition table. Click the "Activate" button to activate the condition table.

20.3.17.2 Specify Access Sequence

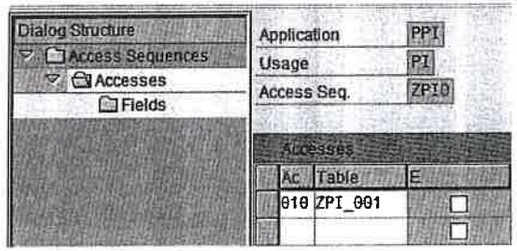
The access sequence determines the sequence in which the condition records for a condition type are found and read. Here, the condition table is assigned to an access sequence.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Print | Specify Access Sequence

The default screen will be in display mode. Click the "Change" button; to make any changes. Click the "New Entries" button; enter the access sequence code in "Access Sequence," enter the description, and select "B Source: Local" for source.



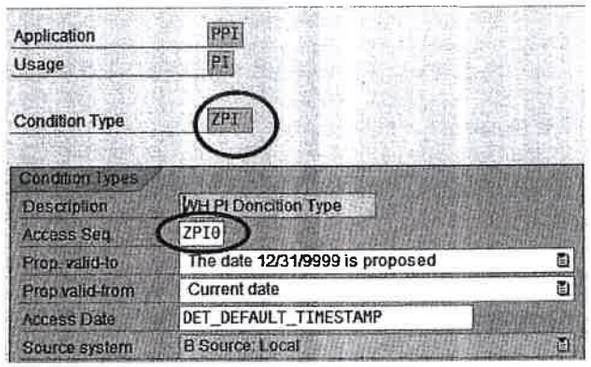
Hit the "Enter" key. Select the access sequence line and click on "Accesses" to assign the condition table.



Hit the "Enter" key and click on "Fields" in the dialog structure. This will display all available fields in the condition table. Verify the fields and click on "Save" to save the changes.

20.3.17.3 Define Condition Types

In this IMG activity, define the condition types for printing PI documents with the PPF and assign an access sequence to every condition type. The access sequence contains a list of accesses to condition tables. The system searches through the condition tables for the appropriate key combination.



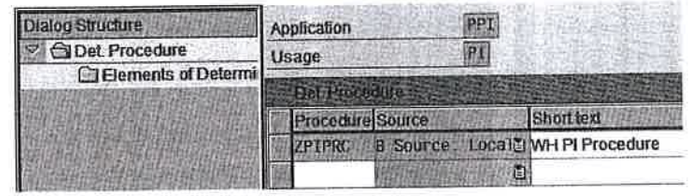
Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Print | Define Condition Types

20.3.17.4 Create and Change Determination Procedure

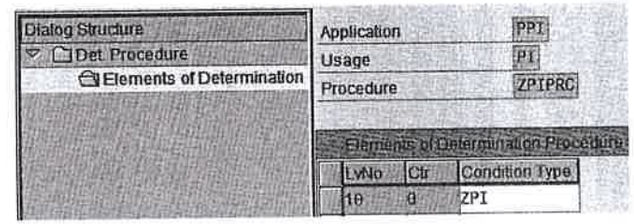
This IMG activity is used to create the PI determination procedure and assign the condition type to it.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Print | Create and Change Determination Procedure

To create determination procedure, click on "New Entries"; enter the procedure ID and the description.



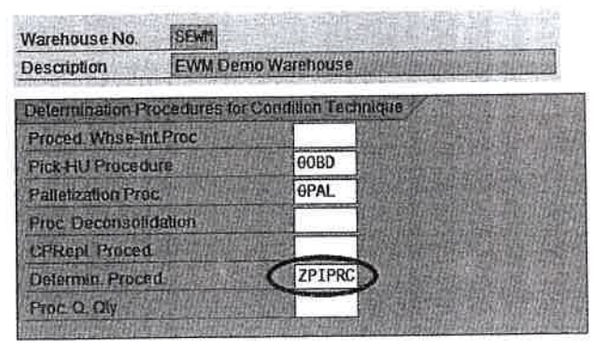
Hit "Enter," select the procedure, and double-click on "Elements of Determination Procedure" under the dialog structure. Here, the level sequence number is specified and assigned a condition type.



20.3.17.5 Assign Determination Procedure to the Warehouse

Once the PI determination procedure is defined, it has to be assigned to the warehouse number.

Menu Path: SPRO | IMG | Extended Warehouse Management | Master Data | Define Warehouse Number Control

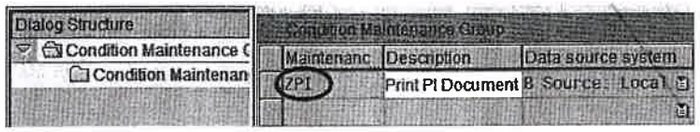


20.3.17.6 Create Condition Maintenance Group (CMG)

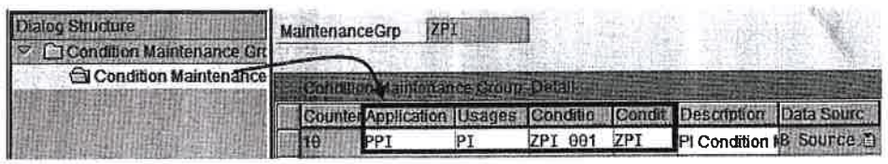
The condition maintenance group bundles condition tables and types for condition maintenance. In order to print PI document, it is necessary to define a CMG for the PI document and register it in maintenance context.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Print | Create Condition Maintenance Group

To define a CMG, click the "New Entries" button, enter maintenance group ID and description, and hit "Enter."



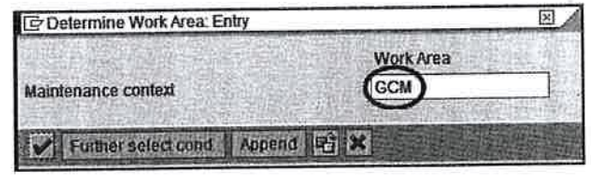
Select the entered line and click on the "Condition Maintenance Group—Detail" menu in the dialog structure. Here, enter the counter (usually defined in increment of tens), application, usage, condition table, condition type, and description. Application and usage are predefined in EWM. For PI, select PPI as an application and PI for usage.



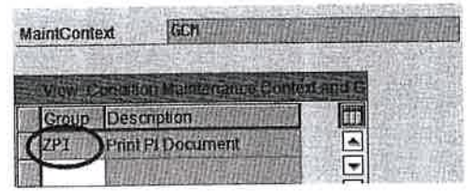
20.3.17.7 Register CMG

Finally, the CMG has to be registered in maintenance context. The predefined maintenance context to print various documents in EWM is CMG. The PI document CMG must be registered under this maintenance context.

Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Print | Register Condition Maintenance Group



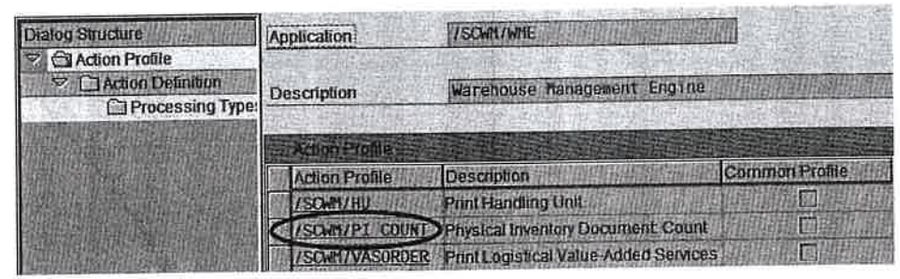
Here, in the work area, select value "GCM." To register the PI CMG, click on "New Entries", select the PI CMG in the "Group" field, hit "Enter" and click on "Save".



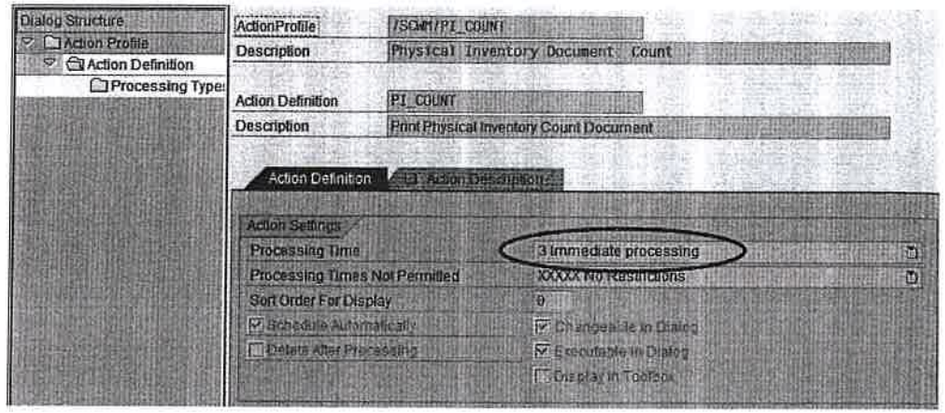
20.3.17.8 Specify Action Profiles for Printing Phy. Inv. Documents

In EWM, SAP has defined the "/SCWM/PI_COUNT" action profile for PI document. Custom action profiles, can be defined if necessary. The following screenshots show the settings for the predefined "/SCWM/PI_COUNT" action profile.

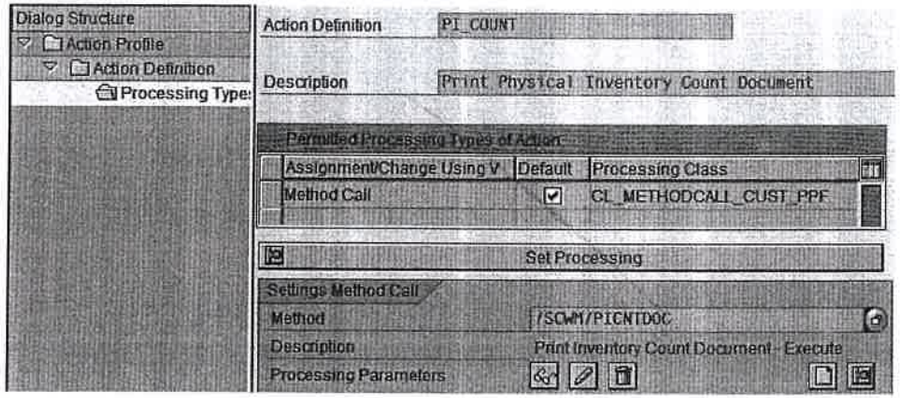
Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Print | Specify Action Profiles for Printing Physical Inv. Documents



Select the line for action profile "/SCWM/PI_COUNT" and double-click on "Action Definition" to see the action settings.



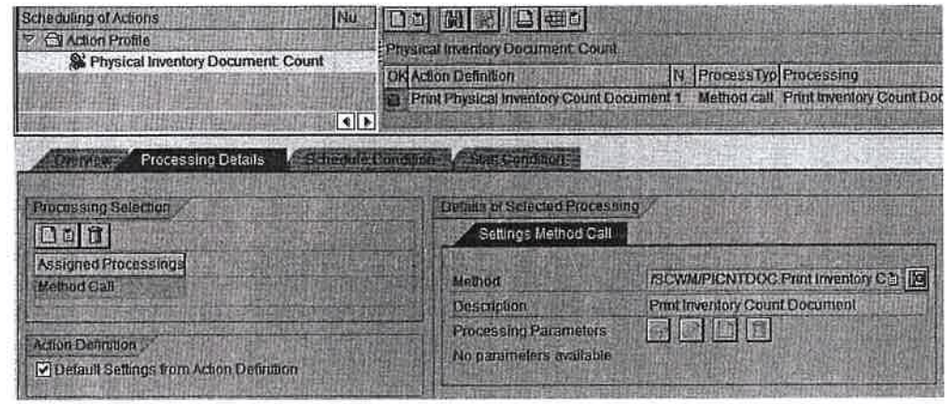
Double-click on "Processing Types" in the dialog structure and verify the processing details. There are no changes required for action profile /SCWM/PI_COUNT.



20.3.17.9 Specify Action Conditions for Printing PI Documents

This is covered in detail in chapter 18. In this menu start condition, scheduling condition, and processing requirements can be specified. There are no changes required to the predefined action profile.

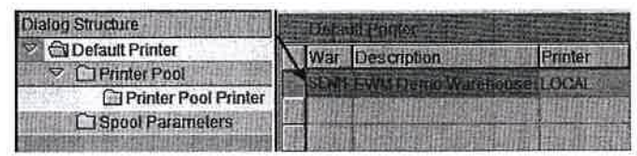
Menu Path: SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Print | Specify Action Conditions for Printing Physical Inv. Documents

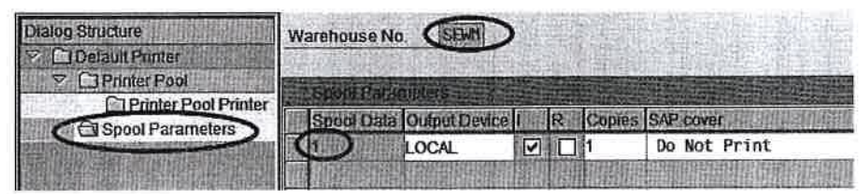


20.3.17.10 Maintain Warehouse-Specific Printing Parameters

In order to print PI documents, spool parameters have to be maintained for the warehouse number.

Menu Path: SAP Easy Access | SAP menu | Extended Warehouse Management | Work Scheduling | Print | Settings | Maintain Warehouse-Specific Printing Parameters or TCode **/SCWM/60000431**

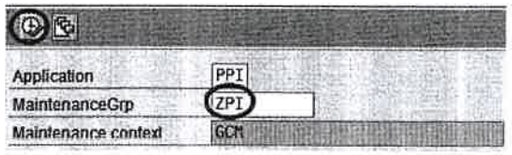




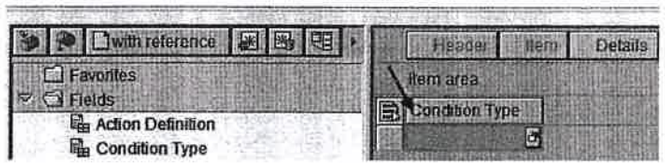
20.3.17.11 Create Condition Records for Printing (Physical Inventory)

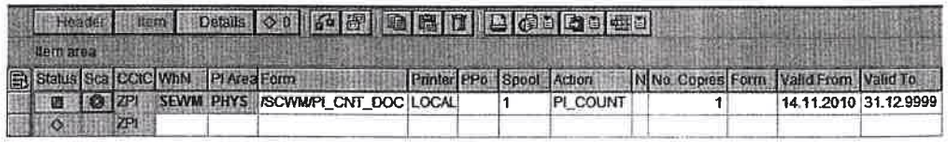
In order to print the PI document, condition records have to be maintained for the warehouse number and PI area. The menu path to Maintain Condition Record is **SAP Easy Access | SAP menu | Extended Warehouse Management | Work Scheduling | Print | Settings | Create Condition Records for Printing (Physical Inventory)** or TCode **/SCWM/PRPI_GCM**

t maintain condition records, select "PPI" in the application field, select the maintenance group, and click "Execute."



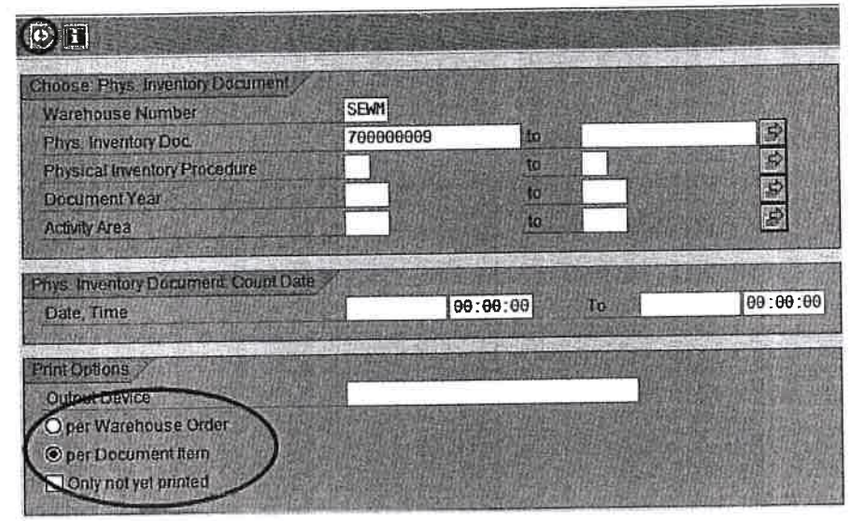
Select the condition type and maintain appropriate values for warehouse number, PI area, printer, spool parameters, and validity period fields. In the following example local printer is defined to print the PI documents.





20.3.17.12 Print PI Document

In order to print PI count sheet use transaction /SCWM/PRPI_DOC. The menu path is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Periodic Processing | Print Physical Inventory Count Document—/SCWM/PRPI_DOC**

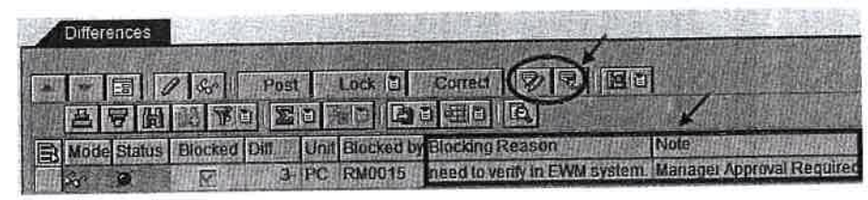


To print a particular PI document, select the radio button "per Document Item." This will provide the option to enter a PI document number.

20.3.18 Difference Analyzer

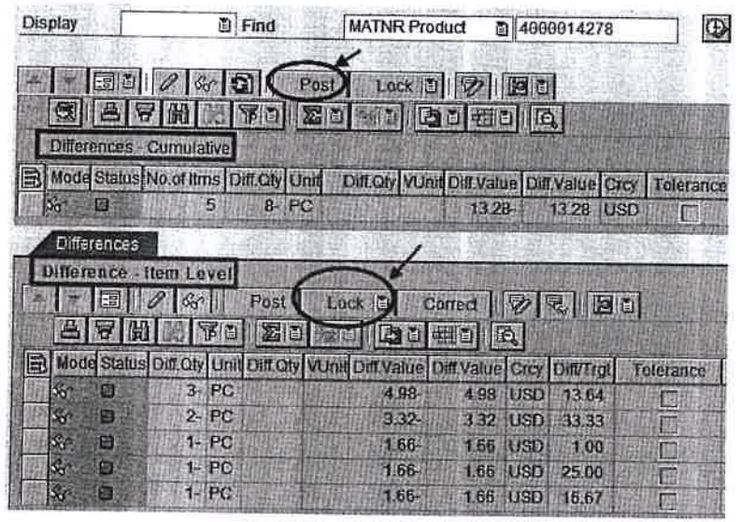
The difference analyzer is a tool available in EWM to analyze the stock count difference before posting to the ERP system. It also allows the users to post the differences to the ERP system, in which case stock will be adjusted in the ERP system and the financial documents will be created accordingly.

To prevent the difference from posting to ERP system, use the "Lock" feature in the difference analyzer; this keeps the difference from posting (both in foreground and background) accidentally until the locked item is released. Thus, additional investigation can be performed for locked items before posting the stock difference to the ERP system. This feature also has a provision to add the blocking reason and a note, which can be used for future reference or for further actions.

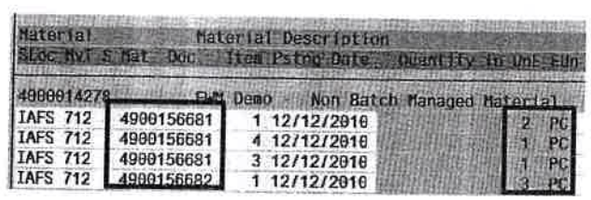


The difference analyzer displays stock differences that have occurred due to WT confirmation, PI document posting, or corrections made to the GR or GI posting in the ERP system. The stock differences are displayed at both a cumulative and an individual level. For the individual level, a link is provided to the document that caused the difference. At the cumulative level, differences are summarized or displayed in an aggregated way.

Menu Path: SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Difference Analyzer—/SCWM/DIFF_ANALYZER



To post the differences to the ERP system, select the line items and click on the "Post" button. This will create the required material and financial documents in the ERP system. The transaction to list the material documents in the ERP system is MB51.

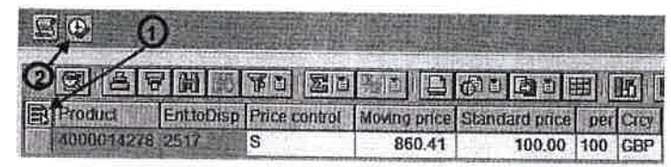


20.3.19 Other PI-Related Transactions

Along with PI transactions (like create, delete, count, and post), SAP has provided additional transactions that may be useful during PI. Some of them are explained below.

20.3.19.1 Determine and Set Prices from ERP

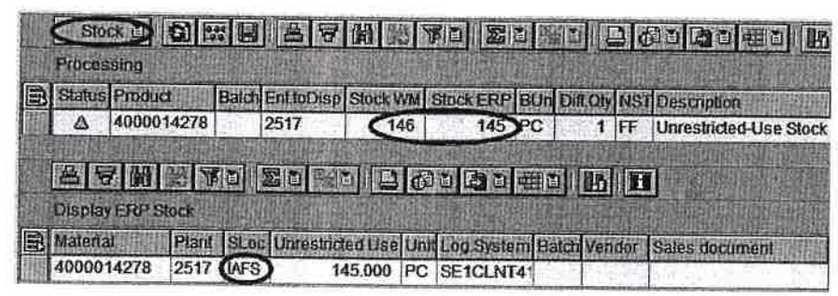
This transaction is used to download product prices from the ERP system to the EWM system. This information is used by the EWM system during tolerance checks (i.e., when PI documents and differences are posted to the ERP system. The menu path for this transaction is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Periodic Processing | Determine and Set Prices from ERP** or TCode **/SCWM/VALUATION_SET**



To download and save the prices in EWM, select all or required line items and click "Execute."

20.3.19.2 Stock Comparison ERP

This transaction is used to identify stock inconsistencies between the ERP and EWM systems. Inconsistencies can arise for various reasons like PI, confirm WT with difference, correction to GR or GI performed in the ERP system, and so on. This transaction compares the stock of both systems and displays the results. The menu path for this transaction is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Periodic Processing | Stock Comparison ERP** or TCode **/SCWM/ERP_STOCKCHECK**



20.3.19.3 Upload/download Storage Bins and Count Data

As of SCM EWM 7.0, SAP does not provide a function for sample-based PI count. If this is required for the warehouse, it may be necessary to use a third-party system to determine which bin must be selected for sample-based counting. Transaction /SCWM/PI_DOWNLOAD can be used to download the storage bin and stock data from EWM system. Once bins are determined for counting, transaction /SCWM/PI_UPLOAD can be used to upload the storage bin data for which PI is to be performed in EWM. Also, using this transaction, counting can be carried out in the external system and the results uploaded to the EWM system.

The menu path for these transaction is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Periodic Processing**

20.3.19.4 Automatically Post Differences to ERP System

This transaction can be used to schedule a background job to post PI difference automatically to the ERP system. Like difference analyzer transaction, the system performs the tolerance check for the user who executes this transaction. The menu path for this transaction is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Periodic Processing | Post Differences to ERP System** or TCode **/SCWM/WM_ADJUST**

Notes:

i. It is recommended to use the difference analyzer transaction to analyze the stock difference before posting the difference to the ERP system. In transaction /SCWM/WM_ADJUST, users cannot analyze the difference in foreground.

20.3.19.5 BAPIs

In addition to these transactions, the following BAPIs can be used to develop custom logic creating, deleting, counting, and posting the PI documents.

- /SCWM/BAPI_PI_DOCUMENT_CREATE
- /SCWM/BAPI_PI_DOCUMENT_DELETE
- /SCWM/BAPI_PI_DOCUMENT_COUNT
- /SCWM/BAPI_PI_DOCUMENT_POST

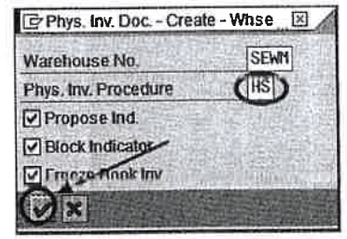
20.4 Ad-Hoc PI Method

The above section covered the required configuration for PI. This section will show how to create and process ad-hoc PI in the non-RF environment.

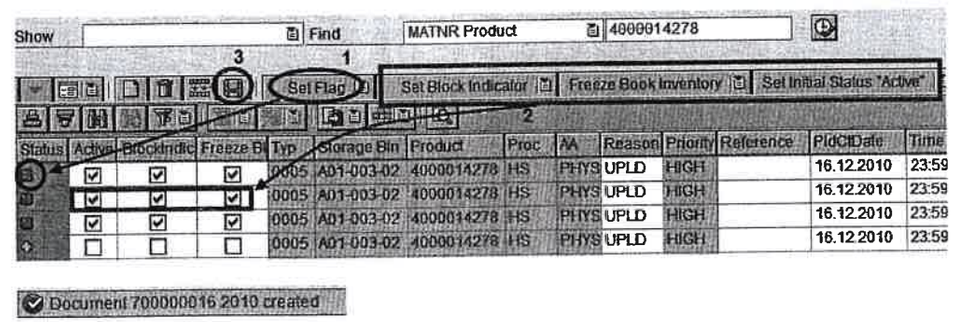
20.4.1 Create an Ad-Hoc PI Document

The menu path to create an ad-hoc PI document is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Create Physical Inventory Document or TCode: /SCWM/PI_CREATE**

Click the "Default Values" button on the application toolbar, enter warehouse number, and select inventory procedure HL (Ad-hoc Physical Inventory (Storage-Bin-Specific)) or HS (Ad-hoc Physical Inventory (Product-Specific)).



Based on the configuration and default values, the system will automatically default the settings of status, active, block indicator, and freeze bin to active or inactive for the proposed items. However, these values can be overwritten before creating PI document. In order to create a PI document, the status flag should be set.

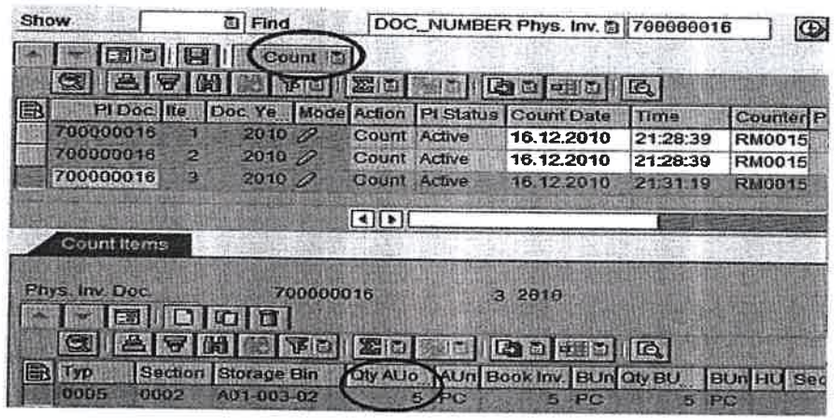


20.4.2 Enter Count Results

Once the PI document is created, users can enter or change the count in transaction /SCWM/PI_COUNT. The menu path for this transaction is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Enter Count Results**

To enter the count, the PI document must be activated. This can be done at the time of the PI document creation or in transaction /SCWM/PI_PROCESS—Process Physical Inventory Document.

To enter the count results, go to transaction /SCWM/PI_COUNT, enter the PI document number, select the line items, and click on "Count." In the popup window, enter the counter name and counting date. Double-click on the items, enter the counted quantity in the ". AUoU" field, and click "Save."

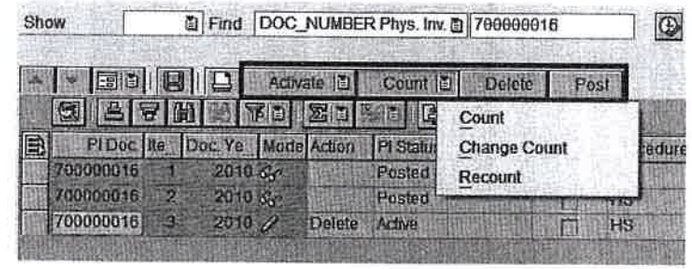


This will save the count results for the PI document.

20.4.3 Process PI Document

Transaction /SCWM/PI_PROCESS can be used to activate, change the count, initiate a recount, or to delete the PI document. If the counted stock matches with the system count, the system will automatically post the difference and unblock the bin (if the bin is blocked) for PI processing. If the difference is not posted automatically, users can select the line items and click "Post" to post the difference manually.

The menu path for this transaction is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Process Physical Inventory Document**



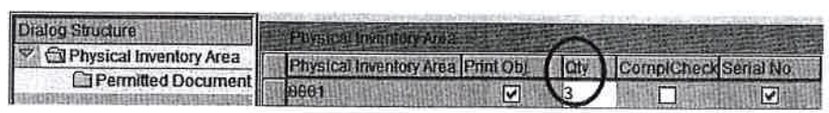
20.4.4 Difference Analyzer

Transaction /SCWM/DIFF_ANALYZER is used to analyze differences and post the differences to the ERP system. The details of the difference analyzer are covered in section 20.3.18. The menu path for this transaction is **SAP Easy Access | SAP menu | Extended Warehouse Management | Physical Inventory | Difference Analyzer**

In order to use this transaction, the user must be authorized for this transaction, and a tolerance limit must be assigned to the user ID in transaction /SCWM/PI_USER_DIFF—Assign User to Tolerance Group for Difference Analyzer.

20.5 Low Stock Check PI

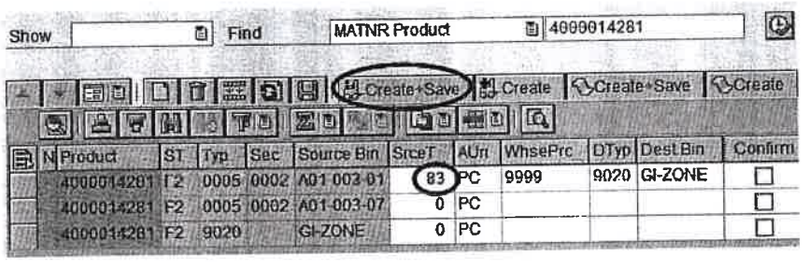
Low stock check PI is performed visually during WT confirmation when the source bin contains only a small quantity after stock removal. The low stock check is storage-bin specific. The required configuration was discussed earlier in this chapter. In order to trigger low stock check, PI threshold value must be maintained for the PI area in **SPRO | IMG | Extended Warehouse Management | Internal Warehouse Processes | Physical Inventory | Physical-Inventory-Area-Specific Settings | Define Physical Inventory Area**



Low stock check is performed at the time of WT confirmation.

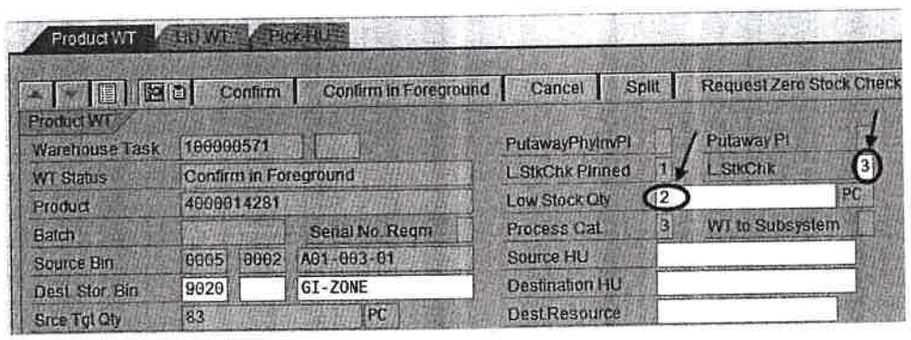
In order to demonstrate this functionality here, a bin-to-bin movement WT is created and low stock check is activated at the time of WT confirmation.

To create a WT for bin-to-bin transfer, follow the menu path **SAP Easy Access | SAP menu | Extended Warehouse Management | Work Scheduling | Create Warehouse Task without Reference | Move Product or Move HU.**

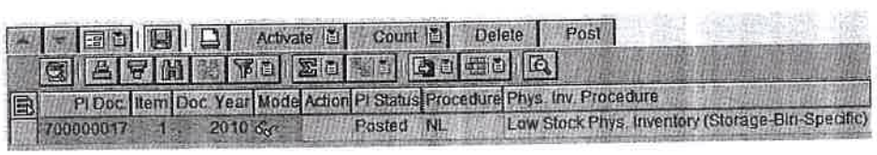


Once the WO is created, confirm the WO in menu path **SAP Easy Access | SAP menu | Extended Warehouse Management | Execution | /SCWM/TO_CONF—Confirm Warehouse Task**

Here, enter the WO number and click "Execute." In the details screen, switch to form view and confirm the WO in the foreground mode. Select "3—Low Stock Check Executed" in the "LStkCHK" field and enter the low stock quantity.



This will create a new inventory document with PI type NL. This document can be checked in transaction /SCWM/PI_PROCESS—Process Physical Inventory Document.



Any differences recorded can be posted to the ERP system in transaction /SCWM/DIFF_ANALYZER—Difference Analyzer.

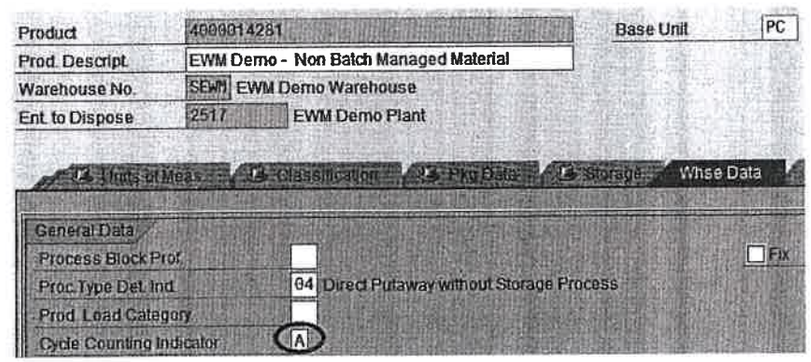
20.6 Cycle Counting PI

The following configuration is required for cycle counting, along with the standard PI configuration. These were covered in detail earlier in this chapter; hence, they will not be covered again.

- Create Cycle Counting Indicators in IMG menu "Configure Cycle Counting."
- Activate the reason code for cycle counting in IMG menu "Define Reason for Physical Inventory." The standard defined code is CCIV.
- Assign default reason code for cycle counting inventory procedure (CC) in IMG menu "Define Standard Reason for Each Phys. Inv. Procedure."
- Update PI area to permit cycle counting in IMG menu "Define Physical Inventory Area" under "Permitted Document Types."

20.6.1 Update Product Master with Cycle Counting Indicators

In transaction /SCWM/MAT1, maintain cycle count indicators in the "Whse Data" tab for warehouse products.

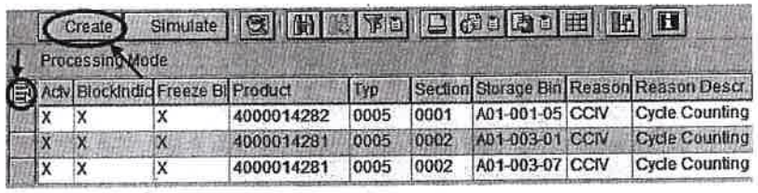


20.6.2 Create PI Document (Cycle Counting)

Transaction /SCWM/PI_CC_CREATE is used to create a cycle counting PI document. The menu path for this transaction is **SAP Easy Access | SAP menu | Extended Warehouse**

Management | Physical Inventory | Periodic Processing | Create Physical Inventory Document (Cycle Counting)

Here, enter the party entitled to dispose and other required filter values, and then click "Execute." Use the background mode to create the PI document directly in the background. If necessary, results can be viewed in simulation mode before creating the PI document by clicking on "Simulate" button.



Adv	BlockIndic	Freeze Bi	Product	Typ	Section	Storage Bin	Reason	Reason Descr.
X	X	X	4000014282	0005	0001	A01-001-05	CCIV	Cycle Counting
X	X	X	4000014281	0005	0002	A01-003-01	CCIV	Cycle Counting
X	X	X	4000014281	0005	0002	A01-003-07	CCIV	Cycle Counting

Once the document is created, users can enter the count and process it just like any other PI document.

Summary

This chapter described the various PI methods and the required configurations to setup the PI process in the EWM system. It also explained how to print the PI document using condition records and the PPF action profile, along with creating and posting PI documents. The chapter also demonstrated how to post the PI difference in the foreground and background under the difference analyzer.

Conclusion

We hope this book has helped you to strengthen your EWM concepts and basics. This book has extensively covered the basics of EWM, which is the foundation for any consultant who wants to grow stronger in EWM. Now that you have reached the end of this book, you might want to explore advanced concepts of EWM like labor management, RF configuration, kit to stock, kit to orders, cross-docking, value added services, yard management, and so on. You can find these topics in **http://help.sap.com | SAP Business Suite | SAP Extended Warehouse Management.** This will bolster your confidence and help you become a stronger consultant in the EWM market, where SAP has plans to continue investing in developing, supporting, and marketing this product.

About Advanced Concepts in SCM-EWM

We are currently in the process of developing content for *Advanced Concepts in SCM-EWM: A Step by Step Guide*, which will cover additional functionalities like labor management, slotting, rearrangements, warehouse cockpit, and RF functionalities. Similar to this book, the advanced topics book will also include configuration guide tables, detailed diagrams, full-screen snapshots, live examples and step-by-step procedures. Reading these two books will help you boost your confidence in the EWM area.

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