Warehouse Management Guide

Release 4.6C

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Icons

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Warehouse Management Guide

Computer support for the organization and management of warehouses has become imperative for timely, effective processing of logistic requirements within a company. The SAP Warehouse Management (WM) application provides flexible, automated support to assist you in processing all goods movements and in maintaining current stock inventories in your warehousing complex.

WM supports warehousing processes by making it possible for you to

- Define and manage complex warehousing structures

- Optimize material flow using advanced putaway and picking techniques

- Process goods receipts, goods issues and stock transfers quickly and easily

Selection Criteria

Although it is possible for you to manage warehouse inventories using the Inventory Management (IM) application component, the primary difference between managing stock in WM and in IM is that in IM, the system can only display the total stock of a material for a storage location. If a warehouse is small and easily manageable, then the use of IM may be sufficient to fulfill your needs.

WM, on the other hand, offers the capability to manage stock quantities in each individual storage bin in highly complex storage facilities. This means that, with WM, you can optimize the use of all storage bins, mix pallets belonging to several owners in randomly slotted warehouses and know exactly where a particular material is located in the warehousing complex at all times.
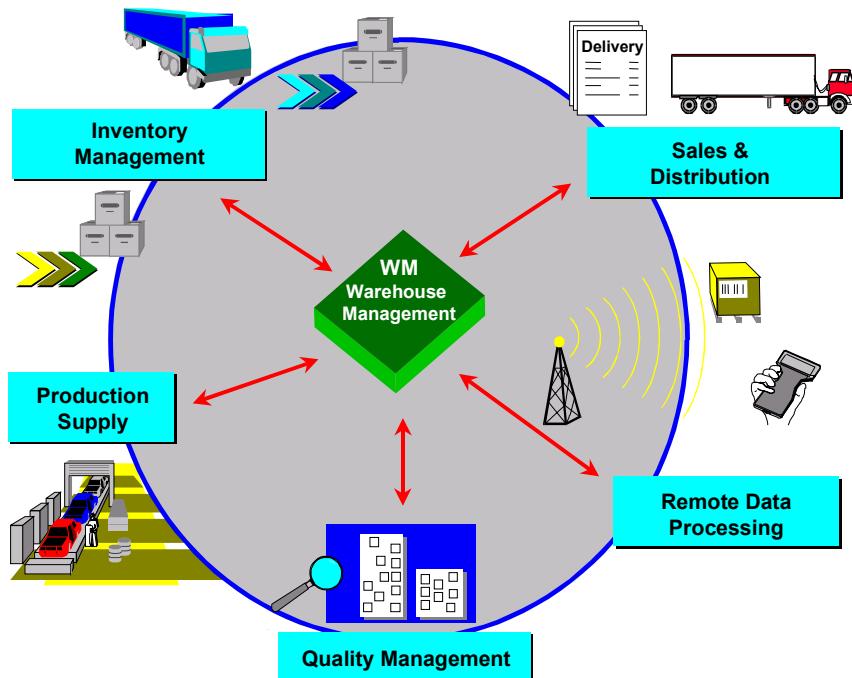
Integration

The Warehouse Management application is fully integrated into the SAP R/3 system. Transactions that are initiated in other SAP components result in corresponding tasks in WM which activate the actual physical transfers within the warehouse.

A few of these activities include:

- Material movements and changes in material status, such as releasing goods from inspection

- Material staging to production supply areas

- Picking and shipping goods for sales orders

Warehouse Management Guide

Most activities that take place within WM are initiated in Inventory Management. For example, most goods receipts, goods issues and posting changes are initiated in IM and subsequently processed in WM.

WM is also interfaced to Sales and Distribution (SD) through the Shipping module to process delivery documents for both the integrated WM application and the decentralized WM system.

The WM interface to Quality Management (QM) allows warehouse administrators to track and manage inspection lots that are stored in the warehouse.

WM is also interfaced to the Production Planning (PP) system to assist in providing materials to supply areas in production.

Features

WM provides several features that support warehousing activities. These include the following:

Warehouse Structure

- Management of complex warehousing facilities to include automatic warehouses, custom-designed storage areas, high rack storage, bulk storage, fixed bin storage and all other commonly used storage areas

- Definition and adaptation of a limitless variety of storage bins for use in your specific warehousing complex

Goods Movements

- Processing of all relevant warehousing activities, such as goods receipts, goods issues, deliveries, internal and external stock transfers, automatic replenishment of fixed bins, material staging to production areas and stock difference handling

- Utilization of random slotting for multiple owners of goods

- Implementation of a variety of putaway and picking strategies including self-designed strategies

- Processing of multiple goods movements with transfer requirements and deliveries simultaneously

- Storage and retrieval of hazardous materials and all other goods that require special handling

- Setup of "forward pick" areas and production supply areas with automated replenishment from case or reserve storage when stock quantities reach a certain threshold

Controlling

- Optimization of capacity and material flow utilizing storage units in the warehouse

- Monitoring and display of stocks on hand and summary evaluations of all goods movements via warehouse controlling tasks

Inventory

- Capability to maintain up-to-the-minute inventory records with the aid of stock transfer confirmation

- Archiving of records of all goods movements and inventory activity

  With its inventory functions, WM ensures that book inventories in Inventory Management match the stock in the warehouse at any time. Because SAP components are fully integrated, you do not need separate interface programs between IM and WM.

Printing Tasks

- Printing (of pallet slips, move orders, delivery slips, inventory documents, and so on) is available for all relevant transactions

  Although it is possible to print material documents for each separate transaction in the warehouse, WM facilitates automatic flowthrough warehousing tasks that are virtually paperless.

Interface to External Systems

- Support for the use of bar code scanners, RF technology, AS/RS and automated forklift systems for all stock movements through an automated ALE warehouse control interface

Lean WM

- This warehousing structure makes it possible to create transfer orders for deliveries when no storage bins are managed in the system. For Lean WM, no goods receipts or goods issues are processed as a subsequent process in WM. This means that no bin data and no stock is updated at the storage bin level using quants. Instead, this transaction takes place at the storage location level. It is used primarily to handle pick orders for deliveries.

  See also:

  Using a Transfer Order as a Pick Order in Lean WM [Page 164]

R/2-R/3 Link

- Interface to an SAP R/2 host system using the decentral R/3 system's user-friendly screens and menus

For users who already have the SAP R/2 System, it is possible to install the R/3 WM user interface so that WM functions can be carried out independent of the availability of the R/2 host system.

See also:

R/2-R/3 Link [Page 490]

Storage Unit Management

- Management and control of material flow utilizing storage units within the warehouse.

    See also:

    Storage Unit Management [Page 402]

Decentralized Warehouse Management System

- The Warehouse Management System (WMS) as a decentralized stand-alone system that is operated separately from a centrally operated ERP (Enterprise Resource Planning) system. The WMS functions not only to store goods but encompasses other related logistics processes and functions independently of the central ERP system.

    See also:

    Decentralized Warehouse Management System [Ext.]
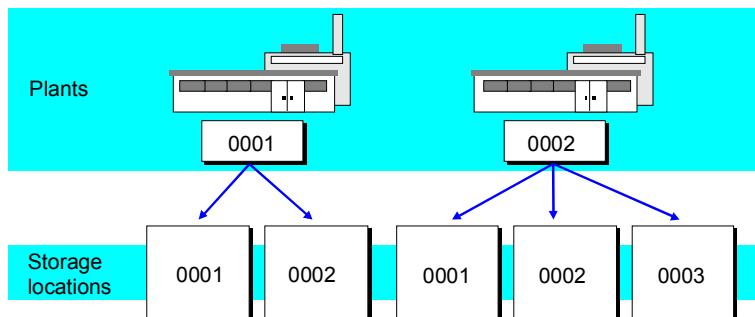
Warehouse Structure in the Warehouse Management System

Before you implement the application component *Warehouse Management* (Warehouse Management System) you must first define the structure, that is, the physical structure, of your warehouse or warehouse complex and depict it in the system.

Warehouse Structure Without WMS

If you are **not** using the *Warehouse Management System*, the **storage location** is the lowest level of inventory management in the system. In the Inventory Management (IM) component, the storage location is defined as the location of physical stock in a plant. In this case, storage locations make up the various warehouse facilities (or areas) of a warehousing complex (for example, high rack storage, picking area or bulk storage). However, you can only manage material stock in a **fixed bin warehouse**. Random storage is not possible. This type of fixed bin is different from a WMS storage bin in that it is entered into the material master record at the storage location level.

If you are using Inventory Management without WMS, you can assign one or several physical storage locations to each plant.

In this example, storage locations are assigned to two plants. The first plant has two storage locations: storage location 0001 (for example, high-rack storage) and storage location 0002 (for example, bulk storage). The second plant has three storage locations: storage location 0001 (for example, high-rack storage), storage location 0002 (for example, bulk storage), and storage location 0003 (for example, picking area).

In this case, Inventory Management supplies information on the stock quantities at storage location level in the form of quantity totals.

In addition to having a warehouse structure without the *Warehouse Management System* (WMS), you also have the option in fixed bin warehouses to process warehouse activities using Lean WM [Page 44]. Here you can use the advantages of transfer order processing without having to manage stock quantities at storage bin level.

> We recommend that you implement Lean WM in fixed bin warehouses for the purpose of picking deliveries.
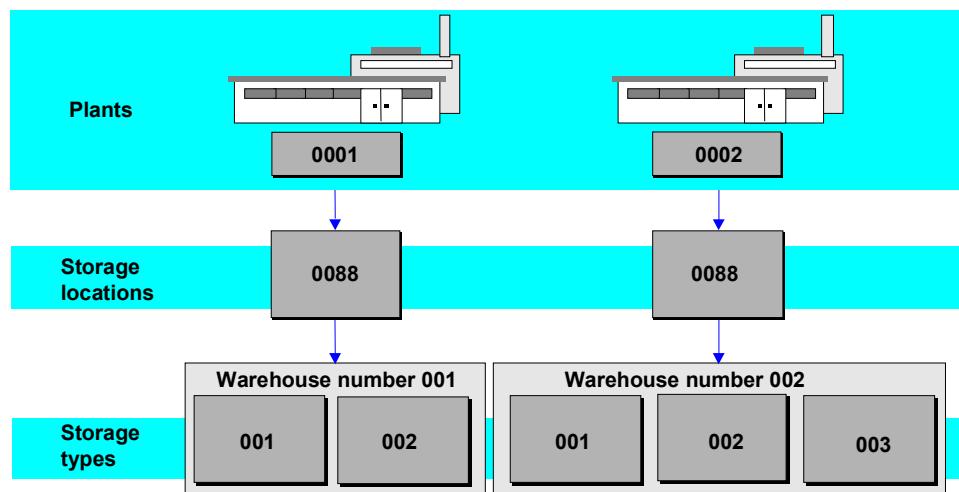
Warehouse Structure With WMS

When you implement the Warehouse Management System (WMS) in a plant, you define the individual warehouses (high-rack storage, block storage, picking area, and so on) as storage types within a warehouse complex and group them together under a warehouse number. As a rule, it is not necessary to define several storage locations for a plant since you assign the WMS warehouse number to a storage location from Inventory Management (IM).

It is appropriate to define further storage locations for a plant if other warehouses (storage types) exist within a plant that is not managed using WMS but with Lean WM, for example.

In WMS you define storage bins for each of the storage types. In this way, WMS manages stock information on all materials in the warehouse at storage bin level. In addition, the stock quantities of the material are managed in Inventory Management (MM-IM) at storage location level. In order to link the information at storage location level with the information from the storage bin, assign a warehouse number to the storage location.
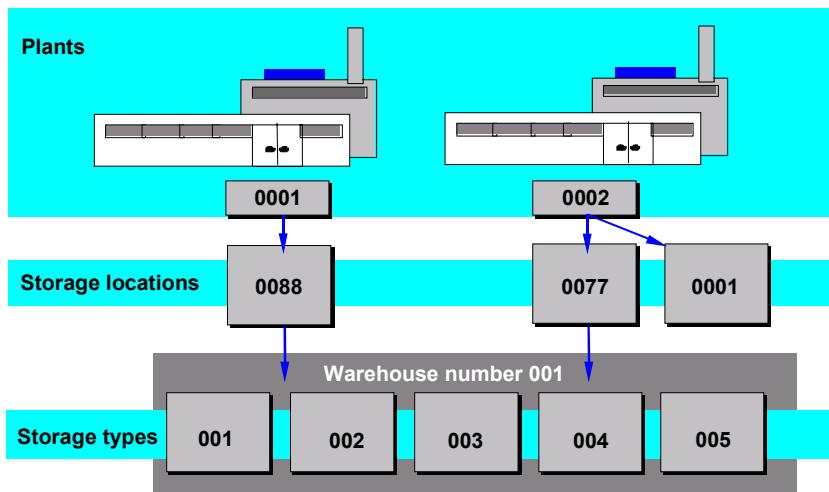
This figure depicts two plants that each manage a storage location using WMS.

- Warehouse number 001 is assigned to storage location 0088 in the first plant. In warehouse complex 001 there are two storage types.

- Warehouse number 001 is assigned to storage location 0088 in the first plant. In warehouse complex 002, there are three storage types [Page 23].

You can also manage stock for several plants in the same warehouse at the same time. In this case, the same warehouse number is assigned to the storage locations for these plants.

Warehouse Structure in the Warehouse Management System
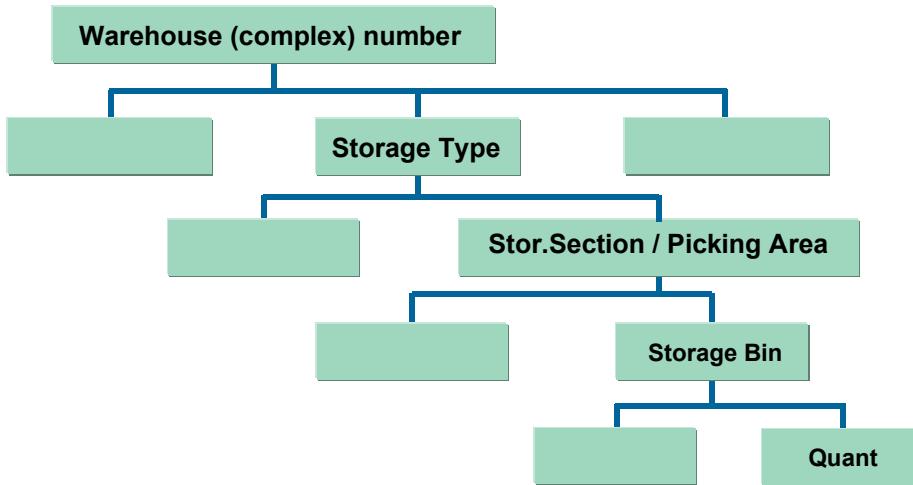
As a rule, it is a good idea to manage only the stocks of one storage location and the same plant within a warehouse number. However, you can also manage several storage locations of one and the same plant within a warehouse number. For scenarios associated with this structural configuration, see Storage Locations in TRs, Tos and Posting Changes [Page 345].

For information on how to link a plant storage location in IM with a warehouse number in WMS, refer to the Implementation Guide under the path *Enterprise Structure → Assignment → Logistics Execution →* Assign warehouse number to plant / storage location [Ext.]

The system uses the links that you create to *Inventory Management* (IM) to ensure that certain processes in *Quality Management* (QM), *Product Planning* (PP), and *Sales and Distribution* (SD) are carried out in the *Warehouse Management System* (WMS) for the appropriate warehouse number.

Warehouse Structure in the Warehouse Management System

Depiction of the Physical Warehouse in WMS

```
        ┌──────────────────────────────┐
        │  Warehouse (complex) number  │
        └──────────────────────────────┘
       ┌────────────┬──────────────┬────────────┐
┌──────────┐  ┌──────────────┐  ┌──────────┐
│          │  │ Storage Type │  │          │
└──────────┘  └──────────────┘  └──────────┘
              ┌───────────┬─────────────────┐
        ┌──────────┐  ┌──────────────────────────┐
        │          │  │ Stor.Section / Picking Area │
        └──────────┘  └──────────────────────────┘
                    ┌───────────┬──────────────┐
              ┌──────────┐  ┌──────────────┐
              │          │  │ Storage Bin  │
              └──────────┘  └──────────────┘
                          ┌───────────┬──────────┐
                    ┌──────────┐  ┌──────────┐
                    │          │  │  Quant   │
                    └──────────┘  └──────────┘
```

The warehouse structure in Warehouse Management is hierarchical and consists of the following elements:

- The Warehouse Number [Page 22]

  You can define an entire physical warehouse complex in WM using a single warehouse number.

- The Storage Type [Page 23]

  Each of the warehouse facilities or areas that make up the warehouse complex can be defined as a type of storage area or "storage type" on the basis of its spatial, technical, and organizational characteristics.

  Each storage type is divided into storage sections. A storage section generally includes all bins that have certain characteristics in common, such as bins for "fast-moving items" near a goods issue area.

- The Storage Bin [Page 29]

  Each storage type and storage section consists of a row of storage spaces that are referred to in WMS as storage bins. The coordinates of the bins indicate the exact position in the warehouse where goods can be stored.

- The Quant [Page 102]

  The quant serves to perform inventory management of a material at the storage bin.

To depict the setup of your physical warehouse in the system, first define the warehouse structures in WMS in the Customizing application. We recommend that you adhere to the following sequence when setting up your warehouse structure in the system.

1.   Define the warehouse number in Customizing under the path *Enterprise Structure → Definition → Logistics Execution →* Assign warehouse number to plant / storage location [Ext.]

2.   Define the storage types in Customizing under the path *Logistics Execution → Warehouse Management → Master Data →* Define Storage Type [Ext.].

3.   Define the storage types in Customizing under the path *Logistics Execution → Warehouse Management → Master Data →* Define Storage Type [Ext.].

4.   Create the storage bins [Page 31].

Warehouse Number

Definition

In *Warehouse Management* (WM), a complete physical warehouse is defined under a **single warehouse number**. Using the warehouse number, you can manage several individual warehouse buildings that, together, form a complete warehouse complex.

Use

The warehouse number encompasses the organizational and physical aspects of a warehousing complex as a single concept.

For example, a unit of weight is defined at the level of the warehouse number. Furthermore, at this level, the system determines the standard unit of measure for WM documents, and special interfaces, such as external interfaces or interfaces between *Warehouse Management* (WM) and *Production Planning and Control* (PP), are defined here as well. You can change these settings subsequently.

> We recommend using one warehouse number for each group of storage areas or buildings (warehousing complex) in the same geographical area. If your warehousing facilities are located in different cities or are physically separated by a longer distance, it is appropriate to assign a separate warehouse number to each warehouse complex.

For information on how to define a warehouse number, call up the Implementation Guide (IMG) for *Warehouse Management* and see under *Master Data* → Define Control Parameters for Warehouse Number [Ext.].

Example

As an example, the warehouse for company XYZ consists of a(n)

- Goods receipt area

- Goods issue area

- Hall with high rack shelves

- Bulk storage area

- Picking area with fixed bins

- Outside storage yard for special goods (This is also used when other areas are already filled to capacity.)

Each of the areas listed above is referred to in WM as a storage type [Page 23]. WM groups these buildings or areas under a warehouse number.

Storage Type

Definition

A **storage type** is a storage area, warehouse facility, or a warehouse zone that you define in *Warehouse Management* (WM) for a warehouse number. This is a physical or logical subdivision of a warehouse complex that is characterized by its warehouse technique, the space used, its organizational form, or its function. A storage bin consists of one or several storage bins [Page 29].

You can define the following frequently-used **physical** storage types in WM:

- Bulk storage

- Open Storage

- High rack storage

- Picking area

- Shelf storage

You can also define storage types in WM that are shared by both the *Inventory Management* (IM) and *Warehouse Management* (WM) application components. These are called **interim storage areas** and include the following: Some of these include

- Goods receipt area

- Goods issue area

- Interim storage area for differences

- Posting change zone

Use

These storage types make up the warehousing complex and can be located in one or several buildings. They are all managed using a single warehouse number [Page 22].

In the standard version of *Warehouse Management*, several complete storage types are already configured and you can use them right away. These include:

- A high-rack storage area

- A bulk storage area

- A picking storage area

- A general storage area

- A pallet storage area

These have all been defined with various control parameters for putaway, picking, and inventory.

> You can use these standard storage types as a basis for your own individual settings, or you can create different storage types to meet the requirements of your company.

Storage Type

Definition of Control Parameters in the Storage Type

You need to define important control indicators at the storage type level that determine the material flow (putaway and picking activities) and the way inventory is handled in each storage type. These include the control indicators for:

- Putaway

- Picking

- Blocking indicators and inventory procedures

> Some control indicators for storage types are mutually exclusive; legal or internal directives may not allow some combinations of indicators. In such cases, the system issues an error message. We recommend that you check and test any new combinations before they are released in the production system.
>
> Only when there are no further stocks available in a storage type can you activate or deactivate Storage Unit Management [Page 402].
>
> We recommend that you only change the capacity check [Page 384] function for a storage type if there is no more stock stored there.
>
> You should be especially cautious when changing control indicators that pertain to putaway strategies [Page 354].

There are indicators in the storage type that can be overwritten in the movement type. That is to say, certain functions, such as confirmation requirement for putaway and picking or allowing posting changes in the same bin, are valid in general for a particular storage type, but not for a particular posting (for example, goods receipts from production do not need to be confirmed).

For further information on how to modify existing storage types or create new ones, refer to the Implementation Guide (IMG) for *Warehouse Management* under the path *Master Data* → Define Storage Type [Ext.].
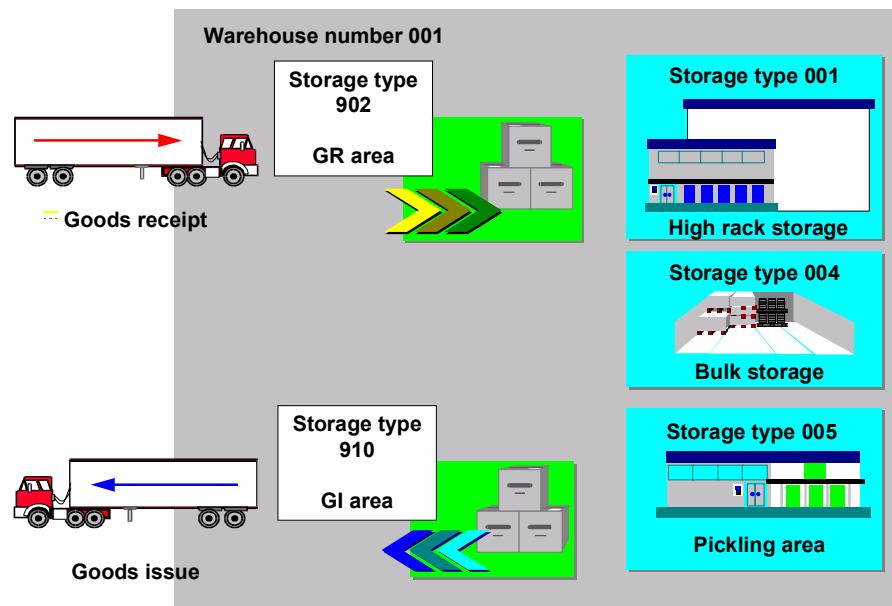
Integration

The *Inventory Management* (IM) application component communicates with the *Warehouse Management* component through interim storage types. Goods receipts and issues posted in IM are automatically updated in WM in these interim storage types.
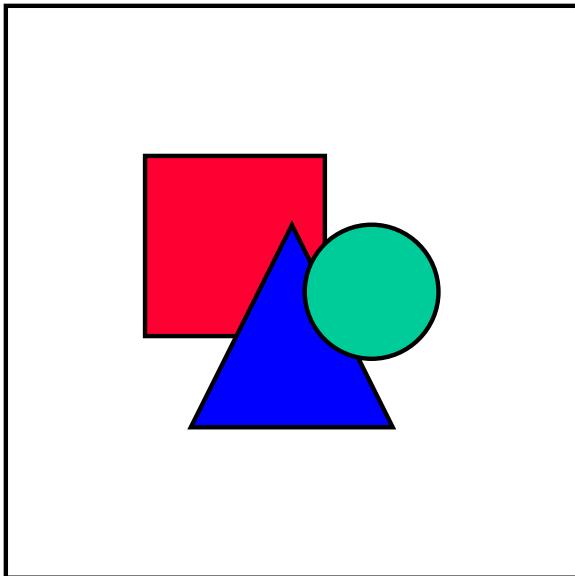
These storage types can have characteristics that are not normally defined in purely physical storage types. For example, they can have negative stock; no capacity check is required and no putaway or picking strategies are defined for interim storage areas.

Example

You can define several storage types for each warehouse number. The following illustration depicts five storage types assigned to a single warehouse number.

Warehouse number 001

Storage type 902 GR area		Storage type 001 High rack storage

Goods receipt

		Storage type 004 Bulk storage

Storage type 910 GI area		Storage type 005 Pickling area

Goods issue

Storage Section

Definition

In Warehouse Management (WM), a storage section is an organizational subdivision of a storage type [Page 23] that groups together storage bins [Page 29] with similar features for the purpose of putting away stock. The criteria for grouping bins can be defined on a user-individual basis, for example, heavy parts, bulky materials, fast-moving items, slow-moving items.

Use

The storage section can serve as an organizational aid for putting away goods in the warehouse. If you decide on using storage types and storage sections, you must define your organizational goals. Here the physical location is often a decisive organizational factor. It is not absolutely mandatory that you subdivide a storage type into two or more storage sections. However, you must create **at least one** storage section for each storage type.
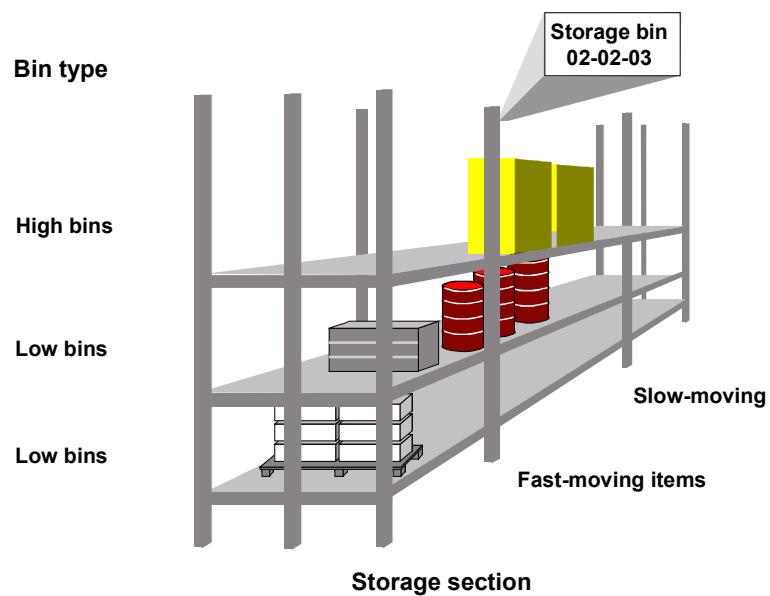
> You may only define control parameters and control values in the **storage type**.

For more information on the definition of a storage section for a storage type, refer to the Implementation Guide (IMG) for *Warehouse Management* under the path *Master Data* → Define Storage Sections [Ext.]

Example

High rack storage areas frequently consist of many storage bins that vary in size. For example, in many such storage areas, the bins in the lower level are larger for especially large and heavy parts, while those in the upper levels are smaller. Often, a high rack storage area is separated into two storage sections. The front section is for fast moving items and the rear section is used for materials with a slower rate of turnover. This is depicted in the graphic below.

Bin type

Storage bin
02-02-03

High bins

Low bins

Slow-moving

Low bins

Fast-moving items

Storage section

Picking Area

Definition

A picking area is a section within a storage type in which all picking activities are carried out in the same way. The picking area groups storage bins [Page 29] together from the viewpoint of picking strategies and is a counterpart to the storage section, which groups bins from the viewpoint of putaway strategies.

Use

In *Warehouse Management* (WM), all items of a delivery or several deliveries are printed out on a pick list. If you define separate picking areas, the system can automatically split up the pick list by picking areas. This enables you to execute parallel picking in these areas and thus accelerate the shipping process. The individual parts of the picking list form different transfer orders.

> You define picking areas A, B and C and assigned each area to a different employee. You executing picking for a delivery whose materials are stored in all three picking areas.
>
> The system automatically splits the pick list into the three areas: the list for section A contains only the materials that are stored in area A, and the same applies to areas B and C. The system creates a transfer order for each picking area, that is, there are three transfer orders for this delivery.

To be able to use picking areas, first define the following data in Customizing for Warehouse Management under the path *Master data* → Define Picking Areas [Ext.]:

- You define one or more picking areas for a particular warehouse and a particular storage type. You can also define a printer for each picking area.

- You determine for every warehouse whether transfer orders can be split for a delivery. You can also print separate picking lists.

Storage Bin

Definition

A storage type [Page 23] generally contains several storage spaces or slots. These are called **storage bins** in *Warehouse Management* (WM). The storage bin is the smallest available unit of space in a warehouse. The storage bin therefore describes the position in the warehouse where the goods are or can be stored.

Since the address of a storage bin is frequently derived from a coordinate system, a storage bin is often referred to as a coordinate. The coordinate 01-02-03 for example, can refer to a storage bin in row 1, stack 2, and level 3.

Use

You assign each storage bin to a specific warehouse number [Page 22] and storage type according to its location. You must also assign each storage bin to a storage section [Page 26].

You can also define the following additional characteristics of a storage bin:

- Maximum weight

- Total capacity

- Fire containment section

- Storage bin type (for example, for small or large pallets)

    With certain stock placement strategies, the storage bin type plays a significant role in optimizing the automatic search for a storage bin in connection with the pallet type. For example, you can define the WM putaway strategy to place large industrial pallets into a specific large bin type and smaller pallets into small bins.

For information on how to define storage bins, call up the Implementation Guide (IMG) for *Warehouse Management* and see under *Master Data* →Storage Bins [Ext.].

Structure

Generally speaking, you can use any combination of letters and numbers for a storage bin coordinate with the exception of certain alphanumeric characters that are used for stock placement strategy P (according to pallet or storage unit type).

> When goods are placed into storage, the system selects coordinates in ascending order according to specific sort criteria, and assigns the next available storage bin based on the coordinate structure you define for creating bins.

See also:

Interim Storage Bins [Page 123]

Creating Storage Bins

Use

You can create one storage bin manually or you can group a range of storage bins with similar characteristics and define them simultaneously.

Procedure

Creating a single storage bin

1. From the SAP Menu, choose *Logistics → Logistics Execution → Master Data → Warehouse → Storage Bin → Create → Manually*.

2. Enter data as required.

   As a minimum, you must enter the storage section for the storage bin.

3. Save your entries.

Creating several storage bins simultaneously

To create a group of storage bins with similar characteristics, you define a template with the coordinate structure as follows:

1. To display a list of all previously defined templates, from the SAP menu choose *Logistics → Logistics Execution → Master Data → Warehouse → Storage Bin → Create → Automatically*.

2. To create a new template, choose *New entries*.

3. Enter the warehouse number, storage type and current number in the first section of the screen. For the current number, enter any number that has not been used previously.

4. In the "Bin definition" section of the screen, enter values to define the template and coordinates of the storage bins that you want to create.

   For more information on how to enter data for defining the storage bin coordinate structure, see the example.

5. You define the characteristics for all storage bins in the "Additional data" section of the screen. As a minimum, you must enter a storage section, storage bin type and maximum weight.

   Save the characteristics data.

6. To generate the coordinates, choose *Environment → Create bins*.

   The system displays a screen with the storage bin characteristics and the coordinates of all the bins that will be generated based on your entries.

7. If the data is **incorrect**, return to the data entry screen, make the necessary corrections, and save the data again.

   If the data is correct, choose *Create online* to create the storage bins or *Create by batch input* to create the bins later in batch mode.

Example: Creating Several Storage Bins

If you chose to create the storage bins in batch mode, the system returns to the data entry screen with a message stating that a batch session was created. Make a note of the batch session name for subsequent processing.

Example: Creating Several Storage Bins

To create the following series of storage bins (coordinates)

02-1-020	02-2-020	03-1-020	03-2-020
02-1-040	02-2-040	03-1-040	03-2-040

you complete the Bin Definition section of the automatic bin creation screen in the following manner:

Storage Bin Coordinate Structure Definition

Bin Definition	Entry									
Template	N	N	C	N	C	N	N	N	C	C
Structure	A	A		B		C	C	C		
Start value	0	2	-	1	-	0	2	0		
End value	0	3	-	2	-	0	4	0		
Increment	0	1	-	1	-	0	2	0		

Template

The template field is used to specify the numeric and non-numeric characters from which bin coordinates are built.

- N represents a variable numeric value.

- C represents a constant.

- A represents ascending alphabetic values.

    ⚠️

    Two alphabetic variables (2 A's) cannot be entered next to each other.

Structure

The structure field is used to group together the numeric characters (N-values of the template) into individual variable sections. These sections are counted by the system.

You must enter the numeric characters in exactly the same positions as the alphabetic characters in the template.

Start value

This data field specifies the storage bin to be created first in a range of storage bins.

End value

This data field specifies the storage bin to be created last in a range of storage bins.

Increment

In this data field, you define the increment for the individual variables (N or A) in the template.

Editing Storage Bins

Use

Using the *Warehouse Management* (WM) application component, you can delete or change one or more characteristics of several storage bins [Page 29] at once. There are various different reasons why you might need to edit storage locations. You might need to:

- Assign another storage section to a group of storage bins

- Reassign bins to another fire-containment section

- Define bins for hazardous material usage

- Reshelf or reslot a storage type

- Correct a mistake you made when creating bins

- Reset the cross-line placement sorting order for a group of bins

- Redefine the picking sequence for a group of bins

> For further information about the cross-line placement search strategy and defining the picking sequence, see Additional Factors for Search Strategies [Page 380].

Prerequisites

There are no restrictions for changing storage bin data.

You can only delete storage bins that are **empty and not blocked**.

Procedure

To edit storage bins, from the SAP menu choose *Logistics* → *Logistics Execution* → *Master Data* → *Warehouse* → *Storage Bin*

Function	Menu Path	Procedure
Displaying a Single Storage Bin	→ *Display*	Enter the required data and choose *Continue*.
Changing Storage Bins	→ *Change* → *Single bin*	Enter the required data and choose *Save*.

Changing Several Storage Bins at Once	→ *Change* → *Selectively*	Enter the required selection criteria and choose *Program* → *Execute.*
		The program produces a list of storage bins.
		Select the relevant storage bins.
		Choose *Change Storage Bins*, and enter the new data.
		The system will only process bins that have been selected.
Deleting a Single Storage Bin	→ *Change* → *Single bin*	Enter the data for the storage bin you want to delete and choose *Continue*.
		Choose *Storage Bin* → *Delete.*
Delete More Than One Storage Bin	→ *Change* → *Selectively*	Enter the required selection criteria and choose *Program* → *Execute.*
		The program produces a list of storage bins.
		Select the relevant storage bins.
		Choose *Delete Storage Bins.*
		The system sets the deletion indicator for the selected storage bins.
		Choose *Save*.

⚠️

Some changes to storage locations make reorganization necessary. This is the case, for example, when you change the sort field or the capacity of storage bins.

Blocking and Unblocking Storage Bins

Use

You can block storage bins for putaway as well as for picking. You must block any storage bins that are no longer accessible, that have been damaged or are to be renovated, or when putaways or picks are not possible.

You can block or unblock storage bins

- Selectively

- On the basis of rows

- In bulk storage with a time limit for putaways

- For the whole storage type

> Putaway block and picking block indicators for storage bins are only checked when you create the transfer order.
>
> If the blocks are set after the transfer order has been created, this has no effect on the open transfer order. This is because the indicators for the transfer order confirmation are not checked again.

Procedure

To block or unblock storage bins, from the SAP menu choose *Logistics →
Logistics Execution → Internal Whse Processes → Bins and Stock → Block*.

Function	Menu Path	What You Should Know
Blocking Bins Selectively	*→ Storage Bin Selection*	
Blocking Storage Bins on the Basis of Rows	*→ Range of Storage Bins*	You can block and unblock the storage bins for a specific area within a warehouse number and storage type, for example, when the conveyor equipment is not working.
Blocking Storage Bins In Bulk Storage According To A Time Limit For Putaway	*→ In Bulk Storage*	You enter the number of days after the first transfer to the row (storage bin), after which no goods can be transferred into the row (see also Time Limits for Blocks [Page 376]).
Blocking Storage Bins for the Whole Storage Type	*→ Storage Type*	Set the required putaway or picking blocks and choose *Save*.

Displaying the Bin Status Report

Use

The bin status report gives you an overview of the storage situation. The storage bin list contains information about capacity utilization in the warehouse, the materials that are stored there, how long the articles have been in storage and the quants [Page 40] that are in storage.

Procedure

1. From the SAP Menu, choose *Logistics → Logistics Execution →Information System → Warehouse → Storage Bin → Bin Status Report*.

2. Enter the selection criteria and choose *Program → Execute.*

   The system displays whether the storage bins in the storage type that you chose are occupied or empty. If a storage bin is occupied, the system displays the material and the number of days the material has been in the storage bin.

3. To display a storage bin record, select a storage bin from the list.

   The *Display Storage Bin* screen appears.

4. To display quant information, select a material from the list.

   The *Display Quant* screen appears.

Displaying Warehouse Capacity

Use

This function allows you to display detailed summary information for storage types, storage bin sections, and bin types on the same screen. You can also choose two- or three-dimensional graphics display for each evaluation.

In addition to providing information about the number and percentage of storage bins that are occupied in the warehouse, you can graphically display the actual percentage use of the occupied storage bins for each storage type and bin type. This enables you to closely analyze the distinction between the data provided for "occupied" and "empty" bins in your warehouse.

Procedure

1. From the SAP menu, choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Bins and Stock* → *Display* → *Capacity Load Utilization.*

    You can choose several storage types and storage bins for a warehouse number. You can also elect to display only unblocked bins or to print the storage type overview.

2. Enter the selection criteria and choose *Program* → *Execute.*

    The system displays the storage capacity information for the storage types selected. If you want to set the indicator *Print Storage Type Overview*, the system will issue an overview of the selected storage types at the beginning of the list.

3. From the storage capacity list, you have several additional options.

Required information	Activity
Call up detailed information on a storage type	Select *Storage type details*
Display all storage bins of a storage type	Position the cursor on the totals line in the upper section of the list and choose *List of Storage Bins*
Display all storage bins of a particular bin type	Position the cursor on the required bin type (**BTy**) and choose *List of Storage Bins*
Display the percentage rate of used storage bins and the capacity used in a storage type as a color graphic	Choose *Graphic*

Quant

Definition

This is the stock of any material **with the same features** in **one** storage bin. The system manages different batches of a material as different quants. The quantity of a quant can be increased by an addition to existing stock. Quants can be created or deleted solely through goods movements.

Use

The quants serve to manage stocks at storage bin level.

When you store goods in an empty storage bin in WM, the system automatically creates a quant in this bin. The system automatically assigns a quant number. The quant is automatically deleted by the system when the material quantity is picked.

In the quant record, the system manages the data of the materials grouped in the quant. This data includes.

- Quant identification

- Plant

- Material number

- Batch number

- Stock category

- Special stock indicator and number

See also:
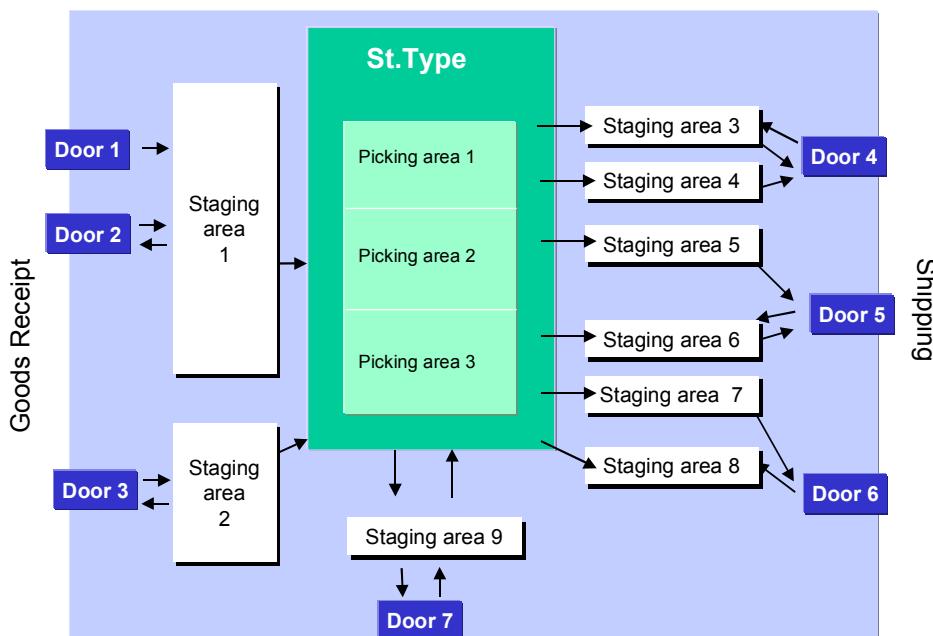
Quant and Stock Management in WM [Page 102]

Door

Definition

This is the location where the goods arrive at or leave the warehouse. It is an organizational unit that is assigned to the warehouse number.

Trucks drive up to the doors of a warehouse in order to unload or load goods there. The doors are located in physical proximity to the respective staging areas [Page 43].

Use

To optimize the putaway and pick processes in your warehouse, you can define doors and staging areas in a warehouse number. You can also assign the doors to the staging areas as goods receiving and shipping points. The staging area is added to the door in the delivery document if there is no other assignment listed under "Door and Staging Area Determination".

You can also assign different functions, even simultaneously, to a door. These include:

- Goods receipts

- Goods issues

- Cross-docking

- Flow through

The system finds the doors and staging areas for the individual deliveries using search criteria that help to optimize the material flow during putaway, cross-docking, and picking.
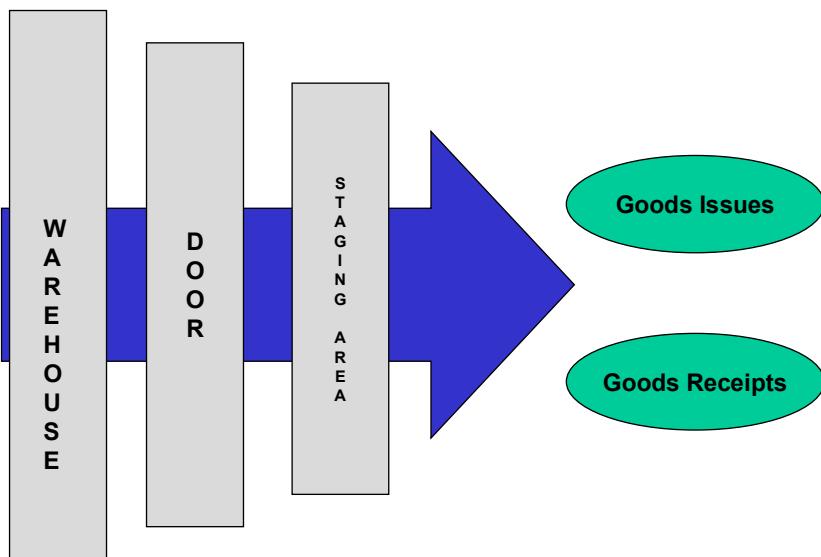
Door

You create this organizational structure in Customizing for *Warehouse Management* under the path *Master Data* → Define Doors [Ext.].

Staging Area

Definition

This is an organizational unit that is assigned hierarchically to the warehouse number. It is used to organize the goods flow in the warehouse.

Use

Staging areas are used for interim storage of goods in the warehouse. They are located in close proximity to the doors [Page 41] assigned to them. Staging areas can also be defined, even simultaneously, for different purposes:

- Goods receipts

    Interim storage of unloaded goods until they are put away

- Goods issues

    Interim storage of picked goods until they are loaded on a truck

In Customizing for *Warehouse Management*, you assign the staging areas to the respective doors under the path *Master Data* → Define Staging Areas [Ext.].

Warehouse Management with Lean WM

Use

When you implement the Warehouse Management System (WMS), you manage goods movements and stock changes in the warehouse at storage bin level. However, if you implement **Lean WM**, inventory management takes place solely at storage location level. The system does not update the stock data at storage bin level using the quants.

You use Lean WM solely for processing goods receipts and goods issues. Using Lean WM, you process the warehouse movements in basically the same way as if using the Warehouse Management System: you work with deliveries, and you create transfer orders for these deliveries. These transfer orders serve as pick lists (see also Using the Transfer Order as a Pick List in Lean WM [Page 164]). We recommend that you implement Lean WM if you wish to pick deliveries in a warehouse that you are not managing using WMS.

The use of transfer orders in Lean WM provides the following advantages:

- You can reprint [Page 170] transfer orders at any time.

- You can split transfer orders [Page 179] and thus distribute the workload better among the staff in your warehouse.

- You can pass on the transfer order target data and the names of those who process transfer orders to the HR application component, where this data can be used to calculate incentive wage.

If you do no wish to update stocks in your fixed bin warehouse at storage bin level, Lean WM provides you with the option of using the advantages of warehouse management through transfer orders in the same way as warehouse management using the WMS.

> If you are already using the standard WM system, we recommend that you implement Lean WM in a further warehouse where no updating of stocks at storage bin level is necessary. In this way, you ensure that the processes for warehouse management are uniform in all warehouses.

Since Lean WM does not update stocks at storage bin level, you can display the stock quantities solely in Inventory Management (IM) and not with the stock overview function in WM. Also, you cannot process possible stock differences [Page 185] that occur in the warehouse using Lean WM, only using Inventory Management (MM-IM):

Prerequisites

You can only implement Lean WM in a fixed bin warehouse; random storage is not possible.

Before you can implement Lean WM, you need to make the following configuration changes in Customizing:

1. Assign a (newly defined) storage location to a warehouse number.

2. Set up at least two storage types:

    - a picking storage type as the source storage type

    - A shipping area as the destination storage type for deliveries

For more information, refer to the section Setting up Lean-WM [Page 46].

Setting Up Lean WM

Use

In order to be able to use Lean WM in your warehouse, you must first execute the following settings in Customizing for *Shipping.*

Procedure

In Customizing for *Shipping*, choose *Picking* → *Lean-WM.*

Customizing Activity	Path	What You Should Know
Defining control parameters and number ranges for the warehouse number	→ Define control parameters and number ranges for the warehouse number	In the SAP standard version, warehouse number **100** is preset for Lean WM. We recommend that you always use warehouse number **100** as a warehouse to copy when you implement Lean WM.
Defining storage type for Lean WM	→ *Define storage type*	In the SAP standard version, different examples of Lean WM storage types are preset in warehouse number **100.** We recommend setting up, as a minimum, the following storage types: • One storage type as the source storage type with one or several fixed bins • A shipping area as the destination storage type for deliveries • Storage type 902 (goods receipt for external deliveries) if you are working with inbound deliveries
Defining the picking area	→ *Define picking areas*	Lean WM is a prerequisite for implementation of picking areas. In the material master, a picking area must be assigned to the material in the view *Plant data / Storage 1.* In the SAP standard version, two picking areas are preset.
Defining transfer types	→ *Define transfer types*	In the SAP standard version, transfer type **A** (outbound delivery) is preset for warehouse number **100** (Lean WM). We recommend keeping this transfer type.

Defining movement types	→ *Define movement types*	The movement type for Lean WM supplies the information that is required for inbound and outbound deliveries. • Destination storage type that appears on the printout of the transfer order. • Control indicator for processing, confirming, and issuing transfer orders (single print or combined print). Movement types **101**, **601**, and **255** are preset for Lean WM. We recommend keeping these movement types.
Defining difference indicator	→ *Define difference indicator*	Via the difference indicator, you can classify stock differences. This indicator is used in Lean WM for evaluation purposes only. In the SAP standard version, difference indicators for Lean WM are stored in warehouse number **100.** We recommend using difference indicator " " (blank) only.
Defining print control	→ *Define print control*	For further information, refer to the Implementation Guide (IMG) for Shipping under the path *Picking → Lean-WM →* Define print control [Ext.].
Synchronizing movement types between Inventory Management (MM-IM) and the Warehouse Management System (Lean WM)	→ *Interface Inventory Management*	In the SAP standard version, all the relevant movement types are preset. We recommend working with the standard version.
Defining degree of activation for Warehouse Management (selection between Lean WM and full WM)	→ *Control Plant / Storage Location / Warehouse Number Assignment*	Decide which feature you want to implement for Warehouse Management and define the control for assignment Plant / Storage Location / Warehouse Number. In the SAP standard version, Lean WM is preset with activation degree **1** in warehouse number 100.

Basic Functions

This section contains information about several additional topics and basic functions that are relevant to WM as a whole or that pertain to a specific user group.

It contains the following topics:

Number Ranges [Page 49]

Foreground/Background Processing [Page 51]

Bar Codes [Page 52]

Authorization Checks [Page 53]

Archiving and Reorganization [Page 56]

Warehouse Controlling [Page 58]

Function Modules and Customer Exits [Page 62]

WM in the Retail System [Page 66]

Number Ranges

Use

Warehouse Management (WM) numbers many objects in the warehouse on a continual basis. The assignment of number ranges provides an orderly sequencing system for several functions within WM.

Assigning Number Ranges

You can define number ranges for the following objects in the Implementation Guide (IMG) for Warehouse Management:

- Transfer requirements

- Transfer orders

- Quants

- Posting change notices

- Groups

- Communication records

- Storage unit numbers

- Inventory numbers

- Inventory numbers for transfers orders

To set number ranges for transfer requirements, transfer orders, quants, posting change notices, and groups, select *Master Data → Define Number Ranges [Ext.]*.

Number ranges for storage unit numbers are only relevant for systems in which Storage Unit Management is active. Detailed information about Storage Unit Management is provided in the Storage Units [Ext.] section. To set number ranges, select *Storage Units → Master Data → Define Number Ranges [Ext.]*.

Normal inventory numbers are assigned for annual inventory, continuous inventory, manual inventory, inventory sampling and cycle counting. Inventory numbers for transfer orders are used when inventory is taken at stock placement or for zero stock checks upon complete stock removal. To set number ranges for inventory documents, select *Activities → Physical Inventory → Maintain Number Ranges [Ext.]*.

> ⚠️
>
> If number ranges have been previously created and assigned to data in the system, problems may occur if they are later changed. We recommend that number ranges be created with sufficient intervals to avoid future complications. The number range for quants should begin with the number 1.

Number ranges for the R/2 → R/3 interface

For users with decentralized Warehouse Management, only number range **01** is allowed for communication records. Communication record numbers are used to monitor communications

Number Ranges

between the R/2 and R/3 Systems for decentralized Warehouse Management. To make the necessary settings, select *Interfaces* → Define Decentralized Link to R/2 [Ext.].

Foreground/Background Processing

Use

For many processes in the Warehouse Management system (WMS), you have the option of selecting foreground or background processing. Transactions that are processed in the foreground allow you to view each step and enter modifications to system defaults manually.

When you create a transfer order for putaway, if you carry out the process in the foreground, you must manually review and process information on several different screens. For example, if the transfer order contains 20 items, you would have to work through 24 separate screens.

If you elect to process a transaction in the background, the entire transaction is carried out in the system without the need for manual inputs by the user.

Advantages of background processing include:

- Some processes run more quickly in the system as background processes and intervention is unnecessary.

- Since some processing steps must not be accomplished manually, individual workload is reduced considerably.

- Detailed information can be skipped by using background processing. This spares the user unnecessary confusion.

Prerequisites

Use *Activities* → Define Transaction Parameters [Ext.] in the Warehouse Management section of the Implementation Guide (IMG) to define default values for foreground and background processing for some transactions.

Features

There are several ways of influencing foreground and background processing in the WMS:

- During most transactions and processes, you can select foreground or background processing manually.

- Movement types: When creating movement types in Customizing, you can set a default value of **H** (foreground processing) or **D** (background processing) for all transactions using the movement type selected.

Bar Code Use

Use

The use of universal product codes (bar codes) printed on consumer product packages, pallets and other containers has become a worldwide standard, not only for product identification and cost management at supermarket check-out counters, but also for inventory control and the optimization of stock movements in the warehouse.

The use of hand-held terminals or other scanning devices can easily be supported for WM transactions as a means to actually carry out physical goods movements.

Features

In WM, bar code scanning is used, for example, to confirm transfer orders. Using bar code reading devices as described above enables your system to scan bar codes that are printed on transfer order documents and other container documents.

The scanning of bar codes can be carried out in two ways:

- Using a hand-held RF/IR device with an interface to the SAP System.

  (See also: Mobile Data Entry [Page 586])

- By connecting a bar code reading device via a keyboard filter to the keyboard entry port of the PC.

  This method is a standard procedure and widely used by many customers. It is easy to implement, since the bar code reader acts just like a keyboard. This supports data entry at defined physical locations where you have an SAP terminal.

Printing Bar Codes

Using SAPScript, not only is it possible for you to print text on warehousing documents, you can also print bar codes as a standard procedure in WM. The WM default is to print bar code EAN 39. However, once the printer is installed to print bar codes, it is easy to print selected document numbers or other bar code types.

Authorization Checks

Use

The authorization concept in Warehouse Management guarantees a smooth and secure organization of warehousing logistics.

Prerequisites

Defining Profiles

Profiles contain authorization objects for a limited number of transactions. For example, the profile **L_WM_ALL** contains all authorization objects for tasks in WM (with the exception of L_ARCH). To define profiles, see *Tools → Authorization management → Create profiles* in the Warehouse Management IMG.

Detailed information on how to define profiles is also found in "Basis / Users and Authorizations" in the *System Administration* documentation.

Defining User Authorizations

For each user who requires authorization to carry out tasks in WM, a user master record must be maintained. To define user authorizations, see *Tools → Authorization management → Define authorizations* in the Warehouse Management IMG documentation.

Detailed information on how to define user authorizations is also found in "Users and Authorizations" in the *System Administration Guide*.

User Authorization Groups

When configuring WM in Customizing, individual views (partial tables containing specific information) are assigned to authorization maintenance groups that must be included in your authorization concept. These groups are assigned to users using the authorization object S_TABU_DIS. The following authorization groups are applicable to WM:

WMA - WM: Application table	Application table views can be maintained as necessary by WM users.
WMC - M: Application control	These views should only be maintained by system managers or those authorized to make changes in WM configuration menus.
WMC1 - WM: Application texts	These views contain descriptions of various indicators used by WM and must be maintained by users who wish to operate the system in more than one language.
WMS - WM: Control SAP	The WM control views are generally not changed unless such changes are discussed first with an SAP AG representative.

Features

For authorization checks in WM, the following objects can be assigned selectively for each user:

L_TCODE	Transaction code in the Warehouse Management System

Authorization Checks

L_LGNUM	Warehouse numbers and storage types
L_BWLVS	Movement types in WM
L_SFUNC	Special functions in Warehouse Management

These authorization objects are assigned to the object class **LE_L**. You can view them by choosing *Tools* → *ABAP Workbench*, *Development* → *Other tools* → *Authorization objects* → *Objects*.

The objects S_ARCHIVE and S_DATASET pertain to archiving of WM data. Additionally, there are authorization objects for the ALE interface.

Transfer Order Processing

When creating transfer orders, a high degree of accuracy is attained by combining the authorization check of the objects L_BWLVS and L_LGNUM. If the system allows a certain WM movement type, you can process all storage types when you create transfer orders as defined in the WM table for movement types and/or the table for alternative storage types.

If a storage type is changed manually, the system makes an additional authorization check for that storage type. The check sequence is as follows:

1. Check for warehouse number authorizations.

2. Check for storage type.

> First the system checks whether the storage type entered is used in the storage type search (Customizing, Strategies). If the storage type is defined in the search sequence, the respective storage type is not checked against the user master. If the storage type is not defined in the storage type search table, the system executes a check against the user master.

The object L_SFUNC provides the authorization to call up automatic transfer order processing for material staging using the WM/PP interface and to execute repair programs.

For more detailed information about the WM authorization objects, see the Warehouse Management IMG documentation.

General Usage

Using the object **L_TCODE** you can limit access to certain Warehouse Management transactions.

All WM transactions begin with the letter "L". If you want to work with hazardous materials, you must also include transactions "VM01 to VM03" in your authorization concept.

Calling up the archiving programs is protected by the authorization group **L_ARCH** (attributes of the reorganization programs concerned). To activate the authorization, you need to add the value L_ARCH to the authorization object **S_PROGRAM** (system authorization).

Displaying Authorization Groups and Table Views

To display the maintenance area assignments for WM tables and views that are delivered with the standard system

1. Choose *System* → *Services* → *Table Maintenance*

2. Enter **tddat** in the *Table* field and choose *Table* → *Display*

3. Choose *Assign authorization groups to tables/views*.

4. Choose *Table name* and/or *Authorization Group*.

5. To display the WM table views together with the authorization groups and view descriptions, enter the following in the *Table name* field:

   – **v_t30***

   – **v_t31***

   – **v_t32***

   – **v_t33***

   – **v_t34***

   – **v_t646***

6. To display the WM authorization groups, enter **WMA, WMC, WMC1** or **WMS** in the *Authorization group* field. (If you are updating your system from a previous version, you can also enter **LC** in this field.)

   Choose ENTER.

You can also display authorization area assignments for WM tables and views using the data dictionary information system.

Archiving and Reorganization

Batch programs have been provided to archive records in the Warehouse Management (WM) application and to reorganize tables and delete old data that is no longer needed in the system. These programs can be used to free space in the database and to provide accessible records for future reference.

Archiving

For detailed information on how to use the archiving reports, see the documentation entitled *BC - Application Data Archiving*.

You can archive the following WM records using these reports:

- RLREOT00   Transfer orders
- RLREOB00   Transfer requirements
- RLREOU00   Posting change notices
- RLREOI00   System inventory records
- RLREOH00   Inventory histories

Reorganization

In addition to reports which provide the capability to archive or safekeep records, two reports are provided that allow you to "delete" records or data which are no longer needed in WM:

- RLREOLPQ deletes inventory data
- RLRE311X reorganizes multiple processing tables

These reports are to be run in batch for technical reasons. For information on how to run a report in batch, refer to the documentation *ABAP/4: Creating Lists*.

Resetting Inventory Data

At the beginning of a new fiscal year, the report RLREOLPQ is used to reset the inventory numbers, items, physical inventory indicators and dates in the storage bins and the inventory numbers and inventory items in the storage bin quantities.

To ensure that you have taken inventory in all storage bins, choose *Inventory →
Evaluations → Inventory status* from the WM menu bar.

Deleting Multiple Processing Table Entries

With report RLRE311X, you can delete the table entries which are no longer required for multiple processing after the processing is completed. This deletes the groups themselves as well as the corresponding entries in the tables used to reference transfer requirements or delivery notes.

For 2-step picking, the reorganization of the multiple processing tables includes table T311L (Definition of the Run within a WM Group). The report separates the entries to be reorganized for

normal multiple processing and those for 2-step picking. The criterion for reorganization for 2-step picking is the indicator "completed" in table T311 (Definition of the WM Group).
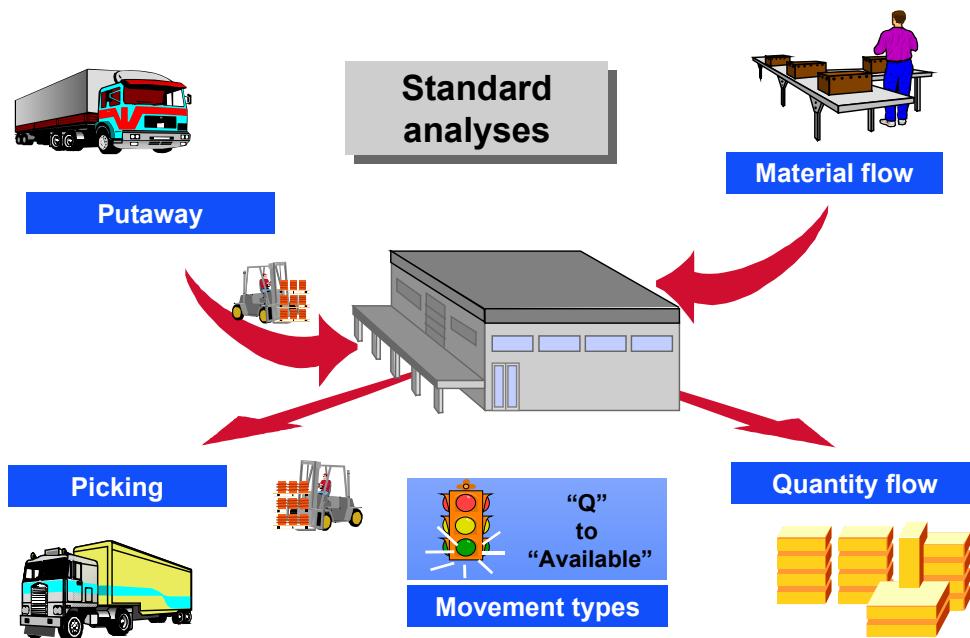
Warehouse Controlling

Use

Warehouse Management (WM) is integrated with the SAP Logistics Information System (LIS) to support the analysis of the physical flow of quantities and workload in the warehouse. Warehouse Controlling evaluates and reduces the extensive information from Warehouse Management to a few essential performance measurements, thus allowing an analysis of weak areas with the aid of graphics. The evaluations for Warehouse Controlling are integrated with the Inventory Controlling menu as standard analyses. These analyses are based on statistical databases in Warehouse Controlling – called "information structures" – into which important, up-to-date performance measures are written directly from the warehousing applications. This data can be used for performance planning purposes.

All five standard analyses for Warehouse Controlling are based on data that is updated to the information structures S090 and S091.

Features

The following five standard analyses for Warehouse Management are available in Inventory Controlling:

- Picking/Putaway

For this analysis, the system displays the total weight and quantities of goods that were putaway, picked or returned.

- Quantity flow

    This analysis displays the quantities and weights that were moved in the warehouse. It also includes information about frequency and the average time expired between transfer requirement or delivery creation and transfer order creation.

- Material putaway/picking

    This analysis is based on the putaway and picking of a material or several materials and includes quantity and weight information for a specific time period.

- Material flow

    Quantity, weight and time required for material movements are considered in this analysis.

- Movement types

    This analysis is based on movement type and the storage types into or from which putaway or picking of stock takes place.

The following table provides an overview of the events that are updated by the information structures S090 and S091 once the update has been activated.

Overview of Events

Event	Information structure
Goods movements/Inventory Management (external quantities) Putaway or picking	S090
Transfer order creation (putaway, picking, return transfers) Transferred quantity	S090 S091
Transfer order confirmation (confirmation of real and unreal differences)	S091

Only physical movements, that is, no inventory adjustment postings or posting changes, are taken into account for updating.

Activating the Update

The update of the two information structures S090 and S091 can be activated in Customizing for Inventory Controlling. If the V1 update is selected, the document is posted with the original documents, if V2 is selected the update takes place at a later time. If you use Multiple Processing [Page 273] [Page 200], you should only work with the V2 update.

Displaying Material Movement Data

To display material movement data

1. Choose *Logistics → Logistics Execution → Information System → Warehouse → Standard Analyses → Material Flow* from the SAP menu.

   From the SAP main menu, choose *Logistics → Logist. controlling → Inventory Contr. → Standard analyses → Warehouse management.*

2. Enter the material number and other appropriate parameters on the initial screen and choose *Execute*.

For more information about the functionality of Inventory Controlling, see the Help documentation on *Inventory Controlling*.

Function Modules and Customer Exits in WMS

Use

You can use function modules and customer exits (enhancements) to replace many existing batch input processes that are used in WM. Additionally, you can use these modules to combine several transactions into one simple screen or to enhance the current functionality of your system to meet the specific requirements of your organization.

Processing TRs using Function Modules

It is possible to create and change transfer requirements in Warehouse Management using function modules. You can and should use these function modules instead of existing batch input processes. This will significantly simplify and improve the performance in comparison with batch processing. All plausibility checks are carried out in the same manner as with the creation of transfer requirements using batch input.

The following function modules are available for WM:

Function Modules for Transfer Requirements

Use...	to...
L_TR_CREATE_CHECK	perform plausibility checks
L_TR_CREATE_UPDATE	perform database updates according to plausibility checks
L_TR_CREATE	perform plausibility checks and database updates
L_TR_CANCEL	cancel plausibility checks and database updates

Processing TOs using Function Modules

You can create, confirm, and change transfer orders in Warehouse Management using the function modules listed below.

The online transfer order processing is divided into three reports.

Reports	Description
SAPML03T	Report **SAPML03T** contains all the screens and tasks necessary to process external documents.
Function group	**Description**
L03A	Function group **L03A** contains essential internal data for creating and confirming transfer orders and calls up the update program. The function modules from group L03A are for internal use only, and are therefore not released to customers.
L03B	Function group **L03B** contains function modules that you should use instead of batch input or CALL TRANSACTION USING, since they are considerably easier to manage.

Function Modules for Transfer Orders

Use...	to...
L_TO_CREATE_SINGLE	Create a transfer order with one item
L_TO_CREATE_MULTIPLE	Create a transfer order with two or more items
L_TO_CREATE_MOVE_SU	Create a transfer order to move a storage unit
L_TO_CREATE_MOVE_LSR	Initiate a stock transfer of storage units from an external system
L_TO_CREATE_TR	Create a transfer order for a transfer requirement
L_TO_CREATE_DN	Create a transfer order for a delivery
L_TO_CONFIRM	Confirm a transfer order
L_TO_CONFIRM_SU	Confirm a transfer order for a storage unit
L_TO_CANCEL	Cancel a transfer order
L_TO_CANCEL_SU	Cancel a transfer order for a storage unit
L_REF_CREATE	Create transfer orders using multiple processing
L_TO_CREATE_2_STEP_PICKING	Create transfer orders for 2-step picking
L_TO_CREATE_POSTING_CHANGE	Create transfer orders for posting changes

Customer Exits for TR Selection

The following customer exits permit you to create customer-specific projects for use in selecting transfer requirements for the automatic creation of transfer orders.

Customer exit	Text	Description
MWMTOAU1	Selection of TRs for automatic TO creation	This task allows you to influence the selection of transfer requirements for the automatic creation of transfer orders.
MWMTOAU2	Selection of TRs for automatic TO creation via groups	This task allows you to influence the selection of transfer requirements for the automatic creation of multiple transfer orders using groups.

Customer Exits for Creating and Confirming TOs

Using customer-specified logic, the following customer exits permit you to become involved in the storage bin search process and, afterwards, to update customer data when creating and confirming transfer orders.

While creating customer-specific projects using this function, you can display additional SAP information about each individual customer exit.

The following customer exits related to transfer orders are available for use in WM:

Customer exit	Description

Use

MWMTO001	Update own data after creating transfer orders
MWMTO002	Update own data after confirming transfer orders
MWMTO003	Customer-defined putaway strategy This task allows you to create and implement your own putaway strategy.
MWMTO004	Customer-defined picking strategy This customer exit allows you to create and implement your own picking strategy.
MWMTO005	TO-related underdelivery (shortage)
MWMTO006	Storage-bin-related overdelivery
MWMTO007	Palletization and storage type search for putaway
MWMTO008	Storage type search for picking This task allows you to create your own storage type search strategy for stock picking.
MWMTO009	Prevents deletion of TO items This task makes it possible to prevent the deletion of transfer order items.

All customer exits are in the same function group and can communicate with each other via global data with some limitations (for example, asynchronous updates).

Creating/Confirming TOs Online or Through Update Programs

For the Warehouse Management function modules, the update program for creating and confirming transfer orders can be controlled via a separate parameter.

Updates for normal transactions are carried out via the update program. However, you can set this especially for creating and confirming transfer orders. To do this, you must change the program **ML03TPAR**.

Constants	Description
DEF_VERBU_CREATE	Default value for creating transfer orders with the values "X" for update via the update program and " " (blank) for update without changing the online process.
DEF_VERBU_CONFIRM	Default value for confirming transfer orders with the values "X" for update via the update program and " " (blank) for updates without changing the online process.

If you want to work without a connection, you should update the statistics via the V2 link.

Further Instructions

It is possible to post data in the system without running COMMIT WORK from the function module.

The system posts the data using synchronous data updates via SET UPDATE TASK LOCAL. This means that the data is not posted and the system also cannot read from your own follow-on programs until the program reaches COMMIT WORK. A database COMMIT is not sufficient for initiating the update. You also need to use the ABAP command COMMIT WORK.

> Due to the resulting delayed posting, you cannot call up several function modules from the group L03B without having a COMMIT between them. This could result in data inconsistencies, for example, because the same empty storage bin or the same stock might be used in consecutive transfer orders.

For a list of the customer exits for the ALE interface, refer to the documentation in *Cross-Application Functions* under MM-MOB and WM-LSR Interfaces [Ext.]. [Ext.].

WM in the SAP Retail System

Use

The full range of functions available in the Warehouse Management (WM) application are available in the SAP Retail System.

This documentation is written primarily for the standard WM application. Therefore, when reading this documentation, if you are using the retail system you need to substitute the following terminology for the SAP Retail System:

Retail Terminology Differences

Standard WM Application	Retail System
plant	company
material	article
material master	article master

Planning and Monitoring

This section provides information about the following topics:

- Rough Workload Forecast

- Picking Waves

- The Warehouse Activity Monitor

In addition to these topics, for information about the **Picking Progress Monitor**, see Analysis of Groups [Page 283].

Rough Workload Estimate

Use

These standard analyses enable the person in charge of a distribution center or warehouse to calculate the rough workload for the next few days. The analyses can be used, for example, for planning how many staff workers are required, for creating wave picks, or for statistical evaluations.

Using these analyses it is possible to display an overview of the workload either per day or per warehouse.

The workload data update is based on SAP documents:

- Purchase order and corresponding shipping notification

- Stock transport order

- Rough goods receipt (only in retail systems)

- Sales order

- Delivery

- Returns to vendor, customer returns and store returns (only in retail systems)

The system updates the quantity, weight, volume, and the number of document items or stock allocations from these documents. Alternatively, processing times can be determined by using Customizing tables.

Integration

The rough workload forecast is a standard analysis [Ext.] in the Logistics Information System (LIS).

All functions of the LO Logistics Information System [Ext.] are available for analysis of the workload data, for example:

- Early warning system

- Dual classification

- Classification

- Hit lists and ABC analysis

- Arbitrary aggregation and disaggregation options

You can also use the planning function [Ext.] to incorporate planned data into analyses, rather than analyzing only actual data.

Prerequisites

Implementation of Lean WM (as a minimum) is necessary to perform rough workload estimation. Rough workload estimation is naturally also possible using the complete WM function.

For information on Customizing, refer to the IMG for Warehouse Management, *Rough Workload Estimate* section.

Range of Functions

The following five analyses are provided for the rough workload estimate:

1. Total overview

2. Goods receipt / putaway

3. Picking / goods issue

4. Customer/stores returns (stores returns only in retail systems)

5. Returns to vendor

With analysis 1, you can determine the entire workload for the distribution center / warehouse for all warehouse processes.

With analyses 2 through 5, you can determine workload for specific warehouse processes.

Wave Picks

Use

Using wave picks, you can perform detailed planning for picking by creating work packages for picking. Wave picks consist of a group deliveries that are to be processed at roughly the same time. You can create wave picks either manually or automatically according to time criteria. Capacity restrictions can be taken into consideration when waves are formed according to time criteria. If the deliveries that are to be picked are already assigned to shipments, you can refer to these shipments when the wave picks are formed.

Integration

Wave picks are groups of deliveries that are identified by a number.

You can execute the following Subsequent Functions for Wave Picks [Page 78] with reference to the wave pick for all deliveries in that wave:

- Planning replenishment for fixed storage bins

- Creating and printing transfer orders

- Confirming transfer orders

- 2-step picking

- Creating and monitoring shipments

- Printing delivery notes / freight lists

- Posting goods issue

- Creating and printing billing documents

You can track the processing status of the wave picks with the wave pick monitor.

Wave picks do not influence the workload that is displayed in the Rough Workload Forecast [Page 68].

Prerequisites

Lean WM [Page 164] is the minimum implementation requirement in order to work with wave picks and most of the following functions. Of course, you can also work with wave picks if you have implemented the full WM system.

You create the wave picks using exact time parameters. For this reason, exact scheduling (down to the minute) is necessary. However, you can work with wave picks without using such precise specifications if you have implemented the route schedule [Ext.] and are using the goods issue time as the comparison time.

For tips on Customizing, refer to the IMG section on wave picks.

See also

Wave Picks with Capacity Restrictions [Page 72]

Subsequent Functions for Wave Picks [Page 78]

Activities

To create wave picks according to time criteria, you must first divide up the workday into smaller units using time slots. You can group these time slots together using the timeslot group.
The system carries out the following steps as it creates wave picks according to delivery time:
Before the individual deliveries are assigned to wave picks, the deliveries due are sorted by:

1. Date

2. Time

3. Delivery priority (field in the customer master)

Afterwards, the system assigns each delivery whose comparison time is in a time slot of a timeslot group to a wave pick that belongs to that time slot. In the case of wave picks with capacity restriction, this is done until the capacity limit is reached.

> As a comparison time, the system selects the goods issue time set in Customizing for the respective warehouse/distribution center.
>
> If the following deliveries exist:

- Delivery A (goods issue time 8:00)

- Delivery B (goods issue time 8:00)

- Delivery C (goods issue time 9:00)

- Delivery D (goods issue time 9:30)

> The selected timeslot group covers 2 time slots:

- Time slot 1 (8:00 through 8:59), wave pick profile 1

- Time slot 2 (9:00 through 9:59), wave pick profile 2

> The system creates the following wave picks:

- Wave pick 1 (8:00 through 8:59): deliveries A, B

- Wave pick 2 (9:00 through 9:59): deliveries C, D

Wave Picks with Capacity Restrictions

Use

Capacity restrictions can only be taken into consideration if wave picks are set up according to time criteria (*Create wave pick according to delivery time* and *Create wave picks according to shipment and compare times*). When an individual capacity limit is reached, the capacity limit of a wave pick is reached. If you run this function in the background, the system only assigns as many deliveries to a wave as the capacity limit allows. In the foreground, deliveries that exceed one of these limits are highlighted in red.

Range of Functions

You can define the following capacity restrictions in Customizing:

- Maximum number of delivery items relevant for picking in a wave pick

- Maximum number of picking transactions in a wave pick

Article A:	150	Packing units
Article B:	1	Pallet
Article C:	5	Pieces
Article D:	250	Packing units
Number of picking transactions:	406	

In order to use these capacity restrictions, execute the following activities in the Implementation Guide (IMG):

- Maintain Unit-of-Measure Load Category [Ext.]

- Assign Units of Measure to Unit-of-Measure Load Category [Ext.]

- Maximum number of packaging materials in a wave pick

Euro pallet:	10
Large container on wheels:	250
Small container on wheels:	15
Amount of packaging material:	275

In order to use these capacity restrictions, execute the following activities in the Implementation Guide (IMG):

- Define packaging material types [Ext.]

- Additional Data for Packaging Material and Time Slot [Ext.]

- Maximum weight of the wave pick's delivery items relevant for picking

- Maximum volume of the wave pick's delivery items relevant for picking

- Maximum processing time for a wave pick in hours (planned workload)

  In order to use these capacity restrictions, execute the IMG activities for workload calculation [Ext.].

Creating Wave Picks - Delivery Time

Procedure

To create wave picks automatically according to time criteria, proceed as follows:

1. From shipping [Ext.], choose *Picking → Wave Picks → Create → According to delivery time.*

   The *Create/Change Wave Picks* screen appears.

2. Enter the number of the warehouse for which you want to create wave picks.

3. Make the following entries in the *Time frame* section of the screen:

   – *Reference date*

     All deliveries whose compare times correspond to this date are incorporated into wave creation for that day.

   – *Timeslot group*

     You can combine various time slots by entering a timeslot group. You get a maximum of one wave pick per time slot.

   – *Time slot*

     In addition to the timeslot group, specify a time slot if you only want to construct a wave pick for that particular time slot of the timeslot group.

   – *Surplus deliveries as of*

     Deliveries that have not yet been assigned to a wave pick can be included when the waves are created. Enter the date as of which these deliveries should be incorporated.

4. Choose a processing type:

   – *Display waves before saving* (default)

     Choose this processing type if you want the waves to appear onscreen, if you want to edit them before saving or if you only want to run a simulation (in the foreground).

   – *Save waves directly*

     Choose this processing type if you want to save the waves immediately without displaying them first (background processing).

     The system saves the waves without displaying them onscreen.

5. In the *Filter* section of the screen, there are various selection criteria that you can use to choose specific deliveries that you want to combine into wave picks.

6. Choose *Program → Execute.*

7. Depending on the processing type you chose, the result is as follows:

   • Display waves before saving

The system displays one or more wave proposals onscreen. You can process these waves further before you save them. For more information, refer to point 8. If you just wanted to run a simulation, choose *Cancel*.

🔆

Information structure S159 is the basis for creation of wave picks. Updating this information structure is controlled in Customizing for wave picks (see *Control update of workload data* in the Implementation Guide). If you have problems creating wave picks, you should check the updating by choosing *Wave Picks → Logs → Update.*

- Save waves directly

The system displays the numbers of the wave picks that have been saved in the database.

8. Using the ABAP list viewer [Ext.], the system displays one or more wave proposals onscreen. The following indicators appear as standard:

- Green traffic light and check mark as save indicator

Waves without capacity restrictions or waves with capacity restrictions that have not been exceeded.

If you expand the wave, the corresponding deliveries will appear.

All deliveries in this wave (except for surplus deliveries) have a green traffic light. The green check mark means they are flagged to be saved.

- Red traffic light with no check mark as save indicator

Waves with capacity restrictions that have been exceeded.

If you expand the wave, the corresponding deliveries will appear.

  - Green traffic light and check mark as save indicator

     Deliveries that are not considered critical as far as capacity is concerned

  - Red traffic light with no check mark as save indicator

     Deliveries that are in the critical range for wave capacity

🔆

Surplus deliveries are generally assigned to the first wave, which appears fully expanded on the screen. Surplus deliveries are marked with a stop sign.

9. In response to a capacity crisis, you could process the waves that are displayed as follows:

- Exclude waves before saving

Get rid of the wave's check mark (saving indicator).

- Delete deliveries from waves

Expand the wave and delete the save check marks from the chosen deliveries. The system only saves those deliveries that are marked to be saved. This means that deliveries that have no check mark will not be saved, even if they are within a wave that is marked for saving.

- Move deliveries among waves

Creating Wave Picks - Delivery Time

To move a delivery from a source wave to a target wave, proceed as follows:

1. Click on the number of the delivery in the source wave that you want to move. The delivery is highlighted in yellow.

2. Now click on the target wave. The delivery is moved from the source wave to the target wave, where it is marked with a plus sign.

10. Save the wave picks

11. The numbers of the wave picks that have been created appear on the screen.

The system creates a log of the activities performed. To view the log, choose *Wave Picks → Log → Wave Pick.*

Processing Wave Picks

1. To process wave picks, start at <u>shipping [Ext.]</u> and then choose *Picking → Wave Picks.*

2. Then, choose the respective menu path from the following table.

Function	Menu path	What you should know
Changing/deleting wave picks	*Wave Picks → Change*	The *Create/Change Wave Picks* screen appears. Enter your selection criteria. You can enter the numbers of the wave picks directly in the *Group* field. The wave picks appear. Waves and deliveries that were saved in spite of capacity problems are marked in yellow. Now you can move deliveries from one wave to another, if necessary. Waves or deliveries will be deleted if you deselect them and then save.
Displaying wave picks	*Wave Picks → Monitor*	The *Wave Pick Monitor* screen appears. Enter your selection criteria. You can enter the numbers of the wave picks directly in the *Group* field. The resulting list gives you an overview of the processing status of the wave picks.

Subsequent Functions for Wave Picks

1. To execute functions subsequent to wave picks, start at shipping [Ext.] and then choose *Picking → Wave Picks → Monitor*.

   The *Wave Pick Monitor* screen appears.

2. Enter the warehouse number and other selection criteria and choose *Program → Execute*.

   The *Wave Pick Monitor: List* screen appears.

3. Select the group of your choice and choose *Subsequent functions →* followed by one of the following menu paths:

Function	Menu path	What you should know
Planning replenishment for fixed storage bins for wave picks	→ *Planning replen.*	You reach the *Replinishm. Planning for Fixed Bins* screen. Continue as described under Planning Replenishment for Fixed Storage Bins [Page 323] and enter the number of the wave pick in the *Group* field. Implementation of the complete WM system is necessary to use the planning replenishment for fixed storage bins function. In other words, implementation of Lean WM [Page 164] is not sufficient.
Creating transfer orders for wave picks	→ *Transfer order*	The *Create TOs by Mult. Processing: Initial Screen* appears. Continue as described under Creating Transfer Orders for a Group [Page 279] and enter the number of the wave pick in the *Group* field.
Release transfer orders for wave picks for printing	→ *Release/Print*	The *Execute Multiple Processing* screen appears. Continue as described under Group Release [Page 280] and enter the number of the wave pick in the *Group* field.
Reprinting transfer orders for wave picks	→ *Pick list (reprint)*	The *Collective Picking List* screen appears. Continue as described under Printing Transfer Orders and Labels [Page 170] and enter the number of the wave pick in the *Group* field.

Confirming transfer orders for wave picks	→ Confirm	The *Transfer Orders for each Group* screen appears.
		Continue as described under Confirming Transfer Orders for a Group [Page 281] and enter the number of the wave pick in the *Group* field.
Executing 2-step picking for wave picks	→ *2-step picking* → *Start picking*	The *Create Removal TO for 2-Step Picking: Initial Screen* appears.
		Continue as described under Executing 2-step Picking [Page 294] and enter the number of the wave pick in the *Group* field.
		Implementation of the complete WM system is necessary to use the 2-step picking function. In other words, implementation of Lean WM [Page 164] is not sufficient.
Creating shipments for wave picks using collective processing	→ *Shipment* → *Shipment coll. proc. run*	The *Create Shipments in Collective Proc.* screen appears.
		Continue as described under Creating Shipments Using Collective Processing [Ext.] and enter the number of the wave pick in the *Group* field.
Choose shipments for wave picks	→ *Shipment* → *Shipment list : planning*	The *Shipment List: Planning* screen appears.
		Use the wave pick number in the *Grouped deliveries* field.
Creating delivery notes for wave picks	→ *Output/papers* → *Delivery note*	The *General Delivery List - Outbound Deliveries* screen appears.
		Enter the wave pick number in the *Document data* section in the *Group number* field.
		Enter the output type in the *Output proposal* section.
	Choose *Program* → *Execute*	A list of individual deliveries in the wave pick appears.
	Choose *Edit* → *Print output*	The delivery notes are generated.
Creating freight papers for wave picks	→ *Output/papers* → *Freight papers*	The *Output from Grouped Deliveries* screen appears.
		Continue as described under Printing Freight Lists [Ext.] and enter the number of the wave pick in the *Group number* field.

Subsequent Functions for Wave Picks

Posting goods issue for wave picks	→ *Goods issue* → *GI collective processing*	The *Outbound Deliveries for Goods Issue* screen appears. Continue as described under Posting Goods Issue with Collective Processing [Ext.] and enter the number of the wave pick in the *Group number* field.
Creating billing documents for wave picks	→ *Create billing document*	The *Billing for Wave Picks* screen appears. Enter your selection criteria. If you want to print the billing documents as you create them, use the corresponding billing type. Enter the wave pick number in the *Group number* field.

Warehouse Activity Monitor

Use

The functions of the warehouse activity monitor are intended to assist warehouse administrators to oversee, plan and optimize work processes in the warehouse. It provides a means to notify responsible personnel in case there are delays or errors in the overall system. The warehouse activity monitor helps you to identify and correct warehousing errors or critical processes soon after they occur, thus enabling you to carry out warehousing transactions in a timely manner.

The warehouse activity monitor provides

- Automatic monitoring of warehousing processes

- Automatic recognition and display of errors in the warehouse

- Support in the analysis of processes in which errors have occurred

- Support to error correction

Why do I need the warehouse activity monitor?

The warehouse monitor is useful for several reasons:

- Not all warehousing processes are carried out in the system without errors.

- Errors are often not recognized until sometime after they have occurred.

- The search for the cause of an error and correcting it can be time consuming.

Orders to move stock in the warehouse should always be processed within a reasonable time period. One of the key features of the warehouse monitoring task is the checking of timely processing of transfer orders in WM.

> For example, if a pallet has not been moved from the goods receipt area to its destination within a few hours, then it is likely that the transfer order has been lost, misplaced or that an error has occurred.

Prerequisites

Whether or not a process or situation is considered to be critical depends upon the object that is to be monitored. You can use various criteria to decide whether a process is critical:

1. As a general rule, you can say that a process is critical if the process has not been completed within an acceptable period of time.

- For example, once the system creates a transfer order, it is expected that, as soon as the material in the has been physically moved to its destination in the warehouse, the transfer order will be confirmed.

- When the system creates a posting change notice, soon afterwards, it is expected that the notice will be converted into transfer orders.

2. For some activities in the warehouse, a deadline is set for the completion of the activity. This applies to

- Supply of materials to production

Warehouse Activity Monitor

     – Delivery processing

   3. For some situations in WM, a certain period of time or duration is considered to be acceptable. These situations can be viewed as critical if the expected time span is exceeded. Examples include:

     – Negative stock. As an example, negative stock is recorded in the goods receipt area if you post a goods receipt in WM before posting it in IM [Page 128].

     – Stock in interim storage types. For example, when you post a goods receipt in IM [Page 127], the system stores this information in the interim storage area for goods receipts.

Setting Time Parameters

You maintain critical time periods using the *Customizing* application. For most of the objects, you can define several critical time periods. For critical time periods, you define the time duration and a corresponding unit of time.

Additionally, you can define a time period with reference to a particular calendar. This ensures that days are excluded that are not to be calculated into the critical time period (such as weekends, holidays and so on).

> All transfer orders that have been created but not confirmed within 4 hours are to be listed as critical transfer orders by the warehouse activity monitor. If the critical time period is defined with reference to the factory calendar, not all non-confirmed transfer orders that are created on Friday will be displayed on Monday morning as critical transfer orders.

When you define the critical time period, you need to ensure that **only the exceptional situations** are displayed by the warehouse activity monitor. This is important because of the additional time required to investigate and resolve a critical situation.

For information on how to configure individual time parameters for the warehouse activity monitor, see the *Warehouse Management IMG* documentation.

Features

In Warehouse Management, the warehouse activity monitor displays objects with critical processes. For each of the monitoring functions, the warehouse activity monitor offers additional functions that help you to analyze and correct errors. The additional functions that are available depend on the object concerned.

The individual objects that you can manipulate in this manner include the following:

Unconfirmed Transfer Orders [Page 84]

Open Transfer Requirements [Page 85]

Open Posting Change Notices [Page 87]

Open Deliveries [Page 88]

Stock in Interim Storage Areas [Page 89]

Negative Stock [Page 89]

Inconsistencies in Stock Figures for Production Supply [Page 91]

Activities

You can control which of the monitoring functions the warehouse activity monitor can display for individual users or for user groups.

Unconfirmed Transfer Orders

Definition

When you display the critical processes for this object, the system lists all open transfer orders that were created but have not been confirmed within the time parameters defined in the system.

Use

The display of unconfirmed transfer orders is used to inform you in a timely manner whether transfer orders have not been confirmed or processed correctly. If desirable, you can then check these transfer orders. Since materials are not available in the system (or for shipment to customers) until the transfer order has been confirmed, it is important to identify unconfirmed transfer orders quickly.

Criteria

You can set the critical time period for the warehouse number and the movement type depending upon the business use of the transfer order.

You can define several different critical time periods for replenishment or for transfer orders for a goods receipt.

Additionally, you can define the critical time period depending upon the source and destination storage types of the transfer order.

Additional Functions

When you display a critical transfer order item, the system provides the following information in addition to the normal display data:

- You can display the stock information in the source, destination and return storage bins of the transfer order item.

- Any additional unconfirmed transfer orders with the same material number, batch, stock category, special stock indicator and special stock number, that access one of these bins, are noted by the warehouse activity monitor and can be displayed if necessary.

Using the warehouse activity monitor, you can carry out the following additional functions for transfer orders:

- Confirm a transfer order in the foreground or in the background

- Cancel a critical transfer order

- Print a critical transfer order again

- Block source, destination and return storage bins for a transfer order item

   You can also unblock these bins. Blocking is meaningful if you need to check stock in a bin to clarify the critical status of a transfer order. This prevents the system from accessing a bin or from carrying out any processes that might change the stock situation in these bins.

Open Transfer Requirements

Definition

This object lists all transfer requirements which have not been fully processed within the time parameters defined in the system.

Use

This object is used to inform you in a timely manner, that

- Goods have been received that have not yet been placed into stock.

- A goods issue was posted in IM that has not yet been posted in WM.

- Unprocessed replenishment requests for fixed bins exist.

- The staging of materials for production was planned but has not yet taken place.

Criteria

When is a transfer requirement considered to be critical?

There are two criteria that determine whether an open transfer requirement is critical:

- It has not been processed by the planned date and time defined in the transfer requirement.

- The system has not set the status of the transfer requirement to *processed* within the time parameters defined in *Customizing* for the warehouse activity monitor.

Depending on the business use (the warehouse number and movement type) of the transfer requirement, you can decide which criteria is to be used by the warehouse activity monitor. You can also define the critical time period depending upon the warehouse number and movement type assigned to the transfer requirement.

The first criterion should be used only if the planned date and time for the transfer requirement actually exist. Otherwise, you should use the second criterion.

Immediate Transfer Order Creation

An exception occurs when the system is setup for immediate transfer order creation [Page 195]. In this case, if the system fails to create the transfer order immediately, transfer requirements become critical soon after they are created because they do not have the status *processed*. Since immediate TO creation for transfer requirements is controlled in the movement type, you can define a second critical time period in *Customizing* that is only valid for transfer requirements with immediate TO creation.

If you do not define this *critical time period* the warehouse activity monitor uses the same criteria as for transfer requirements without immediate TO creation.

If you have defined a special critical time period for transfer requirements with immediate TO creation, the system uses the second criterion.

Additional Functions

Using the warehouse activity monitor, you can carry out the following additional functions for transfer requirements:

Open Transfer Requirements

- You can create a transfer order for a transfer requirement in the foreground or in the background.

- You can change the status of a transfer requirement item to *processed*.

Open Posting Change Notices

Definition

For this object, the warehouse activity monitor displays open posting change notices which have not been fully processed within the time parameters defined in the system. A posting change is not considered to be fully processed until the status of the posting change notice has been set to "U" (*processed*).

Use

The warehouse activity monitor informs warehouse administrators of posting change notices that were initiated in IM or WM that have not been processed in a timely manner.

Criteria

You can set the critical time period in *Customizing* for the warehouse number and the movement type depending upon the business use of the posting change.

As with transfer requirements, there are posting change notices for which immediate transfer order creation [Page 161] is employed.

As with transfer requirements, you can define a second critical time period that is only valid for posting change notices with immediate TO creation.

If you do not define this *critical time period,* the warehouse activity monitor uses the same criteria as for posting changes without immediate TO creation.

Open Deliveries

Definition

For this object, the warehouse activity monitor displays all **WM-relevant deliveries** for which not all items have been picked that meet one of the following conditions:

- The time requirements for staging were not met.

- The time deadline for loading the delivery was not met.

- The time period for the goods issue for the delivery was exceeded.

Use

This task is used to inform warehouse administrators in a timely manner whether deliveries have been processed on schedule. This makes it possible for you to take necessary measures to ensure on-time deliveries. This task also displays deliveries that may have been overlooked.

Criteria

Which of the three conditions above are used to determine whether a delivery is critical or not depends on the comparison time you define for creating the picking wave in *Customizing*. If you do not define a comparison time, the warehouse activity monitor uses the loading time as a reference for the critical time period. The critical time period should be defined so that sufficient time remains to take any corrective measures necessary to ensure that goods can be delivered on schedule.

For deliveries that contain both items that are picked from a WM-managed storage location as well as those that are not WM-relevant, you need to ensure that the warehouse activity monitor decides whether a delivery is critical or not exclusively from the standpoint of WM. This means that a delivery is **not seen as critical** if all WM-relevant items have been picked even though **non-WM-relevant items** exist that have not been picked within the specified time period.

A special case exists if the system selects the material staging time as the reference time because the system enters this time in both the delivery header and in the delivery item. These time periods can vary. Since the warehouse activity monitor only processes data at the header level, only the material staging time period in the delivery header is considered when calculating the critical time period.

Additional Functions

Using the warehouse activity monitor, you can carry out the following additional functions for deliveries:

You can create a transfer order for a critical delivery in the foreground or in the background.

Critical Stock

Definition

With this task, the warehouse activity monitor can display

- stock in an interim storage area [Page 121]

- negative stock

Use

The display of critical stock in interim storage areas makes it possible for you to identify goods movements that have not been fully processed within an acceptable period of time.

Stock in Interim Storage Areas

The warehouse activity monitor displays stock in interim storage areas that has not moved within the time parameters defined in the system.

Stock that exists in interim storage areas always indicates incomplete processes. Therefore, any stock that remains in interim storage areas for a lengthy period of time is considered to be critical.

For stock in interim storage areas, the warehouse activity monitor can display the following open processes:

- Critical stock in the interim shipping area for deliveries

  This can mean that there are open goods issues for materials that have not yet been delivered.

- Stock in the interim storage area for differences

  This can indicate discrepancies (from taking inventory or when confirming transfer orders) that have not yet been cleared.

- Stock in the interim storage area for posting changes

  This means that there may be posting change notices that have not been fully processed.

- Stock in the interim area for goods receipts

  This indicates that there may be goods that have not yet been stored in the warehouse.

Negative Stock

The warehouse activity monitor displays all negative stock that has exceeded the critical time period defined in the system.

The existence of negative stock also indicates incomplete processes that can be displayed by the warehouse activity monitor. For example, these can include:

- posting change notices that are not completely processed

- goods receipts processed in WM that were not yet posted in IM [Page 206]

Critical Stock

Criteria

For critical stock, you define the critical time period for each warehouse number and movement type in *Customizing.* Additionally, you can define whether **all** stock or only stock in dynamic storage bins [Page 123] is to be monitored.

Additional Functions

Using the warehouse activity monitor, you can carry out the following additional function for critical stock:

- For a critical material, you can display all transfer orders that correspond to the critical quant.

  In many cases, this makes it possible to determine the reason the critical situation occurred.

  Frequently, no transfer order exists for a critical stock in an interim storage area. In this case, you can be certain that the critical situation was caused by an IM posting.

Critical TRs for Production Supply

Definition

For this object, the warehouse activity monitor displays inconsistencies in stock quantities that are used for material staging to production.

These critical processes can appear during the staging of materials for production orders for which fixed production bins have been defined in a control cycle. Inconsistencies can occur between the transfer requirements and the transfer requirement quantities that are updated in a reservation when

- Transfer requirements are created manually to supply materials to production storage bins

- Reservations are deleted without making necessary corrections to open transfer requirements in WM

For PP/PP-PI production orders, when components are deleted or changed, the system modifies the transfer requirements automatically. For repetitive manufacturing, this automatic process is not available. As soon as this connection (and therewith, the reservation) is deleted for which transfer requirements have already been created, the transfer requirements are not modified.

Use

The determination of such inconsistencies is important because they can lead to problems when creating transfer orders for the supply of necessary materials to production.

The warehouse activity monitor is able to determine for which materials and storage bins inconsistencies exist, therefore, making it possible for you to take necessary measures to correct potential bottlenecks in production.

Additional Functions

Using the warehouse activity monitor, you can carry out the following additional functions for materials and storage bins for which inconsistencies are found:

- You can display transfer orders that correspond to the material and storage bin displayed.

- You can display all reservations and transfer requirements for the material and storage bin concerned.

Criteria

Unlike the other warehouse activity monitor objects, you do not need to enter any critical parameters for this monitoring function since materials and production storage bins are considered to be critical as soon as the system determines an inconsistency. This is independent of how long the inconsistency has existed.

Using the Warehouse Activity Monitor

Prerequisites

Setting up a Variant

On the initial screen, you can enter a variant so that the system will display only those warehouse activity monitor objects that you want to see on your screen. If you do not enter a variant, all objects that have been activated for monitoring in *Customizing* appear for selection.

1. To call up the warehouse activity monitor, choose : *Logistics → Logistics Execution → Information System → Warehouse → Warehouse Activity Monitor* from the SAP menu.

2. Enter a warehouse number (only one is allowed at any one time) and choose *Program → Execute*.

    From the list of objects displayed, select the field *Display* for all objects that you want to see displayed on the screen for this variant.

3. Once you have selected these objects, choose *Goto → Variant → Save as variant*.

    The system displays the detail screen for defining variants.

4. On this screen, enter a variant name and description.

    Other entries on this screen are optional. The following table provides an example as to how you can use a few of these optional entries.

Optional Variant Limitations

Object	Selection option	Description
Critical transfer orders	Movement type	The system only displays critical transfer orders for the movement types selected.
	Source storage type	The system only displays transfer orders in a selected source storage type.
	Destination storage type	The system only displays transfer orders in a selected destination storage type.

5. To continue, chose *Save*.

In the future, when you enter this variant on the initial screen, each time you call up the warehouse activity monitor, the system only displays the screen associated with this variant. The selection screen will only appear again if you leave the *Variant* field blank.

User Parameters

Once you have defined a variant, you can modify the user parameters so that each time a user selects the warehouse activity monitor from the WM menu, the variant assigned to that user automatically appears on the initial screen. To do this, select *System → User profile → User parameters* from any menu bar. Enter LVA in the Parameter ID (PID) field and the variant you defined in the *Parameter value* field.

Procedure

Once you have defined a variant, you proceed as follows to use the warehouse activity monitor.

1. Choose *Logistics → Logistics Execution → Information System → Warehouse → Warehouse Activity Monitor* from the SAP menu.

2. Enter a warehouse number and a variant, and choose Sie *Program → Execute*.

    The system displays the quantity of critical processes in the warehouse number and the date and time of the information.

    The date-time-group displayed on the monitor depicts the time the data was actually retrieved from the system. You should set up your system to run reports as often as you believe is necessary.

    You can update this information by positioning the cursor on one of the objects and choosing *Edit → Retrieve new data.* When you retrieve new data for an object, the system doesn't wait for the background process (report) that was defined for this object to be executed. Instead, the system executes the report to retrieve the desired information and the quantity and date for that object are updated accordingly.

    If you refresh the screen by selecting *Edit → Refresh*, the system **does not retrieve new data**, but only refreshes the data on the current screen display.

Status Indicators

Traffic light icons are used for each of the warehouse activity monitor objects to indicate their status. The color of the traffic light indicates the status as follows:

Warehouse Activity Monitor Status Indicators

Traffic light color	Processing Status
green	No critical processes exist for this object.
yellow	Indicates that critical processes exist which are already being processed. Some activity has taken place, but these items have not been fully processed or corrected.
red	This object contains at least one critical process that has not been processed.

Detail List Screen

To display a list of objects with more detailed information from the initial hierarchical tree, position the cursor on a category (for example, unconfirmed transfer orders or one of the subordinate categories) and select *Edit → Display details.*

    You can modify the way this screen displays data by selecting *Settings → Display variants → Current*.

Using the Warehouse Activity Monitor

From the detail screens, you can carry out functions that are appropriate for each individual object, such as confirming an unconfirmed transfer order. For a description of each of these functions, see the section **Additional Functions** for each of the individual objects:

Unconfirmed Transfer Orders [Page 84]

Open Transfer Requirements [Page 85]

Open Posting Change Notices [Page 87]

Open Deliveries [Page 88]

Stock in Interim Storage Areas [Page 89]

Negative Stock [Page 89]

Inconsistencies in Stock Figures for Production Supply [Page 91]

See also:

Example: Displaying Unconfirmed Transfer Orders [Page 95]

Example: Displaying Unconfirmed Transfer Orders

This topic describes a few functions that you can carry out when you display unconfirmed transfer orders using the Warehouse Activity Monitor.

When you display the hierarchical trees for unconfirmed transfer orders, you can view details for each individual item on the display list. This may assist you in finding out why a transfer order has not yet been confirmed. You can also display all detail information that is associated with the transfer order item.

Analysis Examples

For a particular transfer order, if you choose *Edit* → *More functions* → *Information on TO* the system displays detailed information that includes both stock quantities and movement data on the same screen. This is useful for data analysis.

> If you display a transfer order (TO) with 10 pieces of material that has not been confirmed and the quantity to be placed into stock for a particular storage bin is 10 pieces, you can immediately see that this TO is the only TO with stock to be putaway in the storage bin.

If a storage bin is highlighted on this screen, at least one or more transfer orders have not been confirmed for the storage bin.

> If 10 pieces of a material are listed for an unconfirmed transfer order but the monitor shows that 100 pieces of the same material are to be stored (status = for stock placement), then it makes no sense to send someone to the storage bin to check to see if the 10 pieces are already there because there are still 90 pieces that are to be putaway in the bin.

Previous activity

If you choose *Edit* → *More information* → *Processing information* the system displays a window with the last 10 actions regarding the item marked with the last action at the top. The user and time of the action are noted at the top of the window.

Blocking Bins

You can block source bins, destination bins and return bins.

> **Partial Picking with Return to Bin**: If material cannot be placed into a bin for any reason, you can choose *Goto* → *Block storage bins* to prevent any further processing while someone checks the corresponding bins.

Additional Options

If another user is processing stock in a bin or the bin itself, the system highlights that item in red and it cannot be accessed as long as it is being processed. This means that you may not always be able to use such functions as *Block all bins* or *Confirm all bins*.

Example: Displaying Unconfirmed Transfer Orders

If you position the cursor on red highlighted items and select *Log*, the system displays a message to explain why it is highlighted.

Basic Stock Management

The following topics regarding the management of stock using the SAP Warehouse Management application are addressed in this section:

Material Master Data [Page 98]

Defining Warehouse Data in the Material Master Record [Page 99]

Displaying the Material Master Record [Page 101]

The Quant and Stock Management in WM [Page 102]

Changing Quant Data [Page 105]
Displaying Quant Information [Page 106]

Types of Stock [Page 107]

Stock Category [Page 109]

Displaying Stock in the Warehouse [Page 111]
Blocking Stock in the Warehouse [Page 112]

Units of Measure [Page 113]

Batch Management [Page 116]

Shelf Life Expiration Date [Page 118]
Displaying Materials with a Shelf Life Expiration Date (SLED) [Page 119]

Storing Materials in the Warehouse [Page 120]

WM Interface to Inventory Management (IM) [Page 121]

Interim Storage Bins [Page 123]

Creating Interim Storage Bins with Predefined Coordinates [Page 125]

Order of Postings [Page 126]

Posting First in IM [Page 127]
Posting First in WM [Page 128]
Comparing Stock Quantities in WM and IM [Page 129]

Material Master Data

Before describing the management of materials in WM, we need to discuss briefly how the material records are organized in the SAP Materials Management system.

What is the Material Master Record?

The material master record contains all information about the materials a company procures, manufactures, stores and ships. The data stored in the material master is not only used by Warehouse Management (WM), but also by other application components, such as Inventory Management (IM), Production Planning (PP), Quality Management (QM) and Shipping (SD-SHP).

The integration of all information about a material into a single record eliminates redundancy and makes it possible to store material data for all relevant system components in a single database.

> This guide describes master data only from the viewpoint of WM. For detailed information about material master data, as well as instructions for creating, changing, or displaying material master records, refer to the *MM - Managing Material Master Data* documentation.

Views in the Material Master Record

You maintain and display material master records using **views**. Just as data in the material master record is maintained for specific departments, such as quality assurance, sales or product planning, some of the data is used specifically by the Warehouse Management (WM) application.

For example, when you maintain material data from the viewpoint of warehouse management, the system displays only the data that is relevant for the storage of the material in the warehouse. General data that is relevant for more than one view (for example, the material's description, its weight, and its volume) appears in several views.

Organization Level for Data

There are two organizational levels that can be defined for WM. In the WM view of the material master record, all the indicators and fields that are used for the entire warehouse number are entered at the warehouse number level. There is also a storage type level with all the indicators that apply to a single storage type but do not for the entire warehouse. If you enter a storage type for a material on the initial screen for the WM view, the system displays an additional section in which you can enter, for example, a fixed storage bin or a control quantity. These fields only apply to the storage type and not to the entire warehouse.

Defining Warehouse Data in the Material Master

Since it is possible to use the Materials Management system without interfacing to Warehouse Management, other views may already exist when you create the WM view in the material master record. For example, data from other system components (such as purchasing, quality management, accounting and storage) may already exist in the material master.

To define warehousing data in the material master

1. Choose *Logistics → Logistics Execution → Master Data → Material → Material → Create → Immediately* from the SAP menu.

    To **change** data in the material master, choose *Logistics → Logistics Execution → Master Data → Material → Material → Create → Immediately.* The steps for changing data are basically the same as those described below. Using this function, you can overtype existing data in the material master record.

2. Enter a material number, industry sector code, and material type and choose *Select view.*

3. Choose *Warehouse Management* and any relevant additional views and choose *Org.levels*.

4. In the organization level window, you must enter a warehouse number as a minimum. You can also enter the plant and storage type. Enter a storage type **only** if you need to enter storage type data for fixed bins or special processing.

    Choose ENTER.

    If you selected only the Warehouse Management view, the system immediately displays the warehouse data screen.

5. As a minimum, you must enter a descriptive text about the material and the base unit of measure. If you entered a storage type on the organizational level screen, additional fields are displayed under the *Storage bin* heading, such as the maximum and minimum quantity that can be stored in a bin and replenishment quantities.

Linking the Material Master Record to a Hazardous Material Record

These steps only apply if hazardous material management is active.

6. To link this material to a hazardous material record, enter the number or designator of the hazardous material in the *Hazardous material number* field.

7. Save the data about the material to the data base.

    In the material status table, two fields are taken into consideration in Warehouse Management that make it possible to limit processes permitted for materials:

    *   Transfer Requirement Instruction:

    Based on the material status, the system issues a notification message when transfer requirements are created manually or via function modules. The system does not issue a notification when transfer requirements are created via the

Defining Warehouse Data in the Material Master

normal IM ↔ WM interface. Warnings are suppressed when the system creates transfer requirements via function modules.

- Transfer Order Instruction:

Based on the material status, the system issues a warning message or an error message when transfer orders are created. When you confirm a transfer order, the system does not issue a notification. Warnings are suppressed when the system creates transfer orders via function modules.

The material status field is located in the "MRP 1" view of the material master record. To make changes to the material status table, see the *Implementation Guide for Logistics*.

See also:

Transfer Requirements [Page 150]

Transfer Orders [Page 159]

Displaying the Material Master Record

The material master record can be displayed from various system components. For example, in the Inventory Management component, you can display the same views of the material master as is possible with Warehouse Management (WM).

To display information about a specific material assigned to your warehouse in the Warehouse Management view

1. Choose *Logistik → Logistics Execution → Master Data → Material → Material → Display → Display Current Status* from the SAP menu.

2. Enter a material number and choose *Goto → Select view(s)*.

3. Choose the *Warehouse Management* view *1*.

    To enter the plant, warehouse number and storage type data, choose *Org. levels*.

4. As a minimum, you must enter a warehouse number. You can also enter the plant and storage type. To display fixed bin or replenishment information about a material, you must enter a storage type.

5. Choose ENTER.

The Quant and Stock Management in WM

Definition

Stock is managed in the SAP Warehouse Management system in **quants** — separate identifiable quantities of material — that are stored in the warehouse.

Is a quant simply a "quantity" of material?

Yes, however, it is a quantity of material **with similar characteristics** in a **single** storage bin. Therefore, if there is a quantity of the same material in a bin that has two separate batch numbers, for example, there would be 2 quants in that bin.

Structure

What data identifies separate quants in a storage bin?

When a storage bin is occupied, the system maintains data about the materials that are stored at that location in the quant record. This information includes:

- Quant identification

- Plant

- Material number

- Batch number

- Stock category

- Special stock indicator and number

If a single storage bin contains 100 pieces of material ABC as follows:
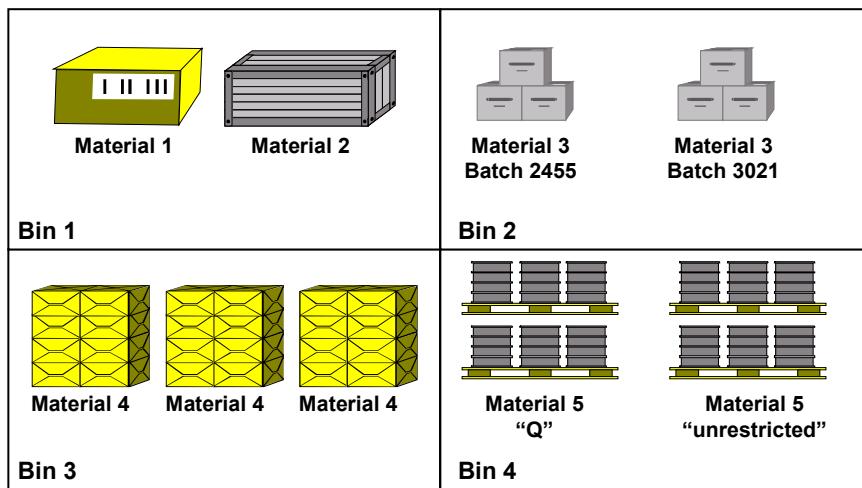
- Batch 01 = 20 pieces

- Batch 02 = 50 pieces

- Batch 02 = 30 pieces of inspection stock

There are 3 quants in this storage bin.

The following graphic illustrates how quants are used in storage bins:

From left to right:

- The first storage bin has two quants, a single quant for material 1 and a single quant for material 2.

- The second bin contains 2 quants of material 3, each with a separate batch number.

- The third bin has a single quant of material 4.

- The fourth bin has 2 quants of material 5. The first quant is quality inspection stock with a stock category of "Q". The second quant of material 5 has been released from inspection and is now "unrestricted" stock that is available for use.

The amount of material in a quant can be increased by adding material to existing stock.

The different types of stock (categories) and special stock are passed to WM from IM and serve as stock separation characteristics in the quant. WM has no stock categories nor any special stock types of its own.

Since it is possible to manage stocks from different plants within one warehouse complex number, the plant must also exist as a stock separation characteristic in the quant.

Active storage unit management in a storage type can also influence the number of quants in a storage bin. (To see how quants are handled in SU-managed storage types, see)

In customizing, for each storage type you can define whether only one quant or several quants can be stored in a storage bin. For each storage type, you can allow mixed or homogeneous storage (see). You can also permit the addition to existing stock at this level. This means that goods with the same material number and the same additional quant criteria can be combined during putaways and stock transfers.

⚠️

When adding materials to existing stock, quant characteristics are combined. This means that the quant information in the stock that is added to existing stock is lost and takes on the quant characteristics of the stock that is already stored in the bin. This includes, for example, the goods receipt date and caution should be exercised for FIFO stock. This quant information does not go away until the storage bin has been completely emptied.

The Quant and Stock Management in WM

What additional data is kept in the quant record?

• Data about the last transfer

• Data about the last inventory

• Stock amounts, for example stock that is available or stock that is being transferred to or from a storage bin

• Blocking indicators

How is a quant created?

When you store goods in an empty storage bin in WM, the system creates the quant in the bin. This means that the system issues a quant number and, when the quantity of material is picked, the quant number is automatically deleted again.

> This number has no significant meaning for your company and is used for management purposes in WM.

Integration

Why is the use of the quant meaningful in WM?

Since the system automatically assigns a quant number to each separate quant in WM, the system can optimize material flow and manage stock in the warehouse more efficiently.

Shelf life expiration date (SLED)

The SLED field only exists in the quant when shelf life management is active in Materials Management (MM). This happens when the material master is maintained accordingly.

During a stock placement in MM you can enter either the production date or the shelf life expiration date. This depends upon whether the field *Remaining shelf life* has been maintained in the material master record. For example, if 10 days have been entered into this field, the system assumes that when goods are received, the production date was entered and calculates the shelf life automatically. If you leave this field empty in the material master, the system makes it possible for you to directly enter the shelf life expiration date.

This date that is entered or calculated during the goods receipt is then noted in the quant that is created in the storage bin. If you add stock to an existing quant in a storage bin, the shelf life expiration date of the new quantity that is added is lost.

See also:

Shelf Life Expiration Date [Page 118]

Changing Quant Data

To change data for a single quant:

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Single Displays → Quant* from the SAP menu.

2. Enter the warehouse number, the storage type and the bin coordinate of the quant you want to change and choose ENTER.

3. To access the quant, choose *Stock*.

   If there is more than one quant in the storage bin, a list of quants appears.

4. To change a quant in the list, position the cursor on the quant you want to display and choose *Change Quant*.

5. Make changes to the quant on the detail screen. Data that cannot be changed is not accessible.

6. Save the changes to the data base.

Displaying Quant Information

There are several tasks in WM that you can use to display information about quants in the warehouse.

- For example, to display the stock information for a specific material in the warehouse with the stock category of Q, choose : *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Bin Stock per Material* from the SAP menu.

  Enter a warehouse number, material number, plant, **Q** (in the *Stock category* field), and choose ENTER.

- To display the stock information for a specific storage type, such as an interim storage area, choose : *Logistik → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Bin Stock per Material* from the SAP menu. Then choose *Program → Execute*.

  For example, to display stock in the interim storage area for goods receipts, enter a warehouse number and the storage type (902 in the standard system).

To display the individual **quant** information for a material in the bin status report, position the cursor on a material and choose a material.

Types of Stock

Special Stock

Special stock is managed separately in the Warehouse Management (WM) application for reasons of ownership or for various factors reflecting the location in which they are kept. Each type of special stock is assigned a special stock indicator to aid in managing it in the system.

Special stock characteristics assigned during goods movements transactions in the IM component are displayed on WM screens and taken into consideration when processing stock in WM.

You can manage the following special stock using WM:

Individual Customer (Sales Order) Stock (E)

Individual customer (make-to-order) stock is managed in WM using a special stock number and the special stock indicator E. The special stock number is made up of the sales order number (10 digits) and the sales order item (6 digits).

Consignment Stock (K)

Stock of materials made available by the vendor and stored on the premises of the ordering party. This stock remains in the ownership of the vendor until it is removed from the warehouse and used for production purposes or taken over into the company's own valuated stock.

Consignment stock is managed in WM using a special stock number and the special stock indicator K. The special stock number for consignment stock is the same as the supplier (vendor) number.

Returnable Transport Packaging (RTP) Vendor (M)

Multi-trip packaging medium (such as pallets or containers) in which goods can be transported between vendors and customers. It is the property of the vendor and is therefore not included in the customer's valuated stock.

Project Stock (Q)

Material which is held in the warehouse for the completion of a project. For project stock, the system checks to see whether a corresponding master record exists.

System Checks

In conjunction with the special stock indicator, the system checks the length of the special stock numbers as shown below:

Indicator	Special Stock	Maximum length of special stock number
E	Individual customer stock	16 digits
K	Consignment	10 digits
M	Returnable transport packaging vendor	10 digits
Q	Project stock	24 digits

Stock Category

In WM, it is important to know what quantity of a stock is in a particular storage bin, but also its status and whether or not it is available. Stock in the warehouse is categorized in WM as follows:

Available Stock

Unrestricted-use stock that is physically located in the warehouse, valuated, and not subject to any kind of usage restrictions. You can carry out all stock movements for this stock to include stock transfers, putaway and picking.

Inspection Stock

This stock carries the stock category **"Q"** to indicate that it is in quality inspection. Stock in quality inspection has been valuated but does not count as unrestricted-use stock.

The Quality Management inspection data in the QM view of the material master determines whether a percentage of stock is to be designated as inspection stock when it is received in the warehouse. Once this stock has been inspected and a usage decision has been made, you carry out a transfer posting in the Inventory Management component and subsequent Posting Change in WM to remove the category Q, thus converting it to available stock.

Blocked Stock

In IM it is possible to designate goods as blocked stock. These materials are a company's own stock that should not be used. Stock can be blocked, for example, because it has been damaged and for various other reasons. This stock is displayed in WM with a stock category of **"S"**. This stock is processed in exactly the same manner as inspection stock.

> For blocked stock, there are movement types in both IM and WM which you can use to convert blocked stock into inspection stock and vice versa (movement types 349 and 350 in the standard IM component with reference to 309 in WM).

Blocked Stock Returns

When delivered goods are returned by a customer, they are first posted in the system to "blocked stock returns" with a stock category of **"R"**. This stock is neither valuated nor is it considered to be unrestricted-use stock. It is possible store this stock in the warehouse. You must carry out a posting change to return it to available stock.

Status of Stock in the Warehouse

When goods arrive in the warehouse, they are usually received in the Goods Receipt Area (GR-Area) near the receiving dock. Later, they are transferred using a transfer order to another area within the warehouse, such as high rack shelving or other reserve storage areas. In some cases, goods are moved directly to fixed bins in a picking area near the goods issue area or shipping dock.

During the period of time when move orders have been created for the movement of goods between the various storage types that have not been fully processed, two availability statuses exist for this stock which has not yet been moved. When warehouse evaluation lists are displayed for these material, these goods appear on the display lists under the following three headers:

Stock Category

Quantity or Total Stock

This designator usually appears at the top of many stock display lists. This is the total quantity of material quants stored in the warehouse that does not include quantities for planned putaways and picks. For the display of materials in a bin, the total quantity in each storage bin is also displayed.

For Stock Placement

This column designator appears in some stock lists. The system has created a transfer order for this stock to move it from one storage bin to another. It has been marked for putaway (storage) in the warehouse.

For Stock Removal

This is also a column designator that appears in some stock lists. A transfer order has been created to pick this stock from a storage bin in the warehouse. In most cases, this stock will be transferred to a storage bin in the goods issue area.

Displaying Stock in the Warehouse

Specific Material

To display stock for a specific material, by plant and storage type:

1. Choose *Logistik → Logistics Execution → Internal Whse Processes → Bins and Stock →
   Display → Total Stock per Material (Warehouse Management)* from the SAP menu.

2. Enter a plant, material and warehouse number and choose `ENTER`.

   You can also enter a storage location and/or storage type to further limit the output for
   this task.

To generate a list of stock for a range of storage types and storage bins, choose *Logistics →
Logistics Execution → Information System → Warehouse → Stock → For all materials*.

Batch of Material

To display the location of materials with a specific batch in the warehouse, choose *Logistics →
Logistics Execution → Information System → Warehouse → Stock → Per Material - Bin-Related*.

Stock in a Storage Bin

To display the quants for a single storage bin:

1. Choose Sie *Logistics → Logistics Execution → Information System → Warehouse → Stock
   → Per Storage Bin*.

2. Enter the warehouse number, storage type, and storage bin on the selection screen and
   choose `ENTER`.

Blocking Stock in the Warehouse

The possibility exists in WM to block material quants in the warehouse, for example, due to damage to stock or perhaps to reserve the stock in the warehouse on request for a specific customer.

To block quants of a specified material in the warehouse

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Block → Stock Figures* from the SAP menu.

2. Enter a warehouse number and a material. You can leave the plant field blank or enter either a single plant or a range of plants. As additional selection criteria, you can select materials that are already blocked (for stock placement and/or stock removal) and you can specify a batch, stock category, special stock, and special stock number.

   To start the blocking process, choose *Program → Execute*.

3. Mark each storage bin that you want to block or unblock.

   To mark all bins, choose *Edit → Select all.*

4. To block the selected storage bins, choose *Block*; to unblock, choose *Unblock*.

5. Select the type of block, enter the blocking reason and choose *Continue*.

6. Save the changes to the data base.

   The system remains on the list screen and displays a message that the blocking for the material has been changed.
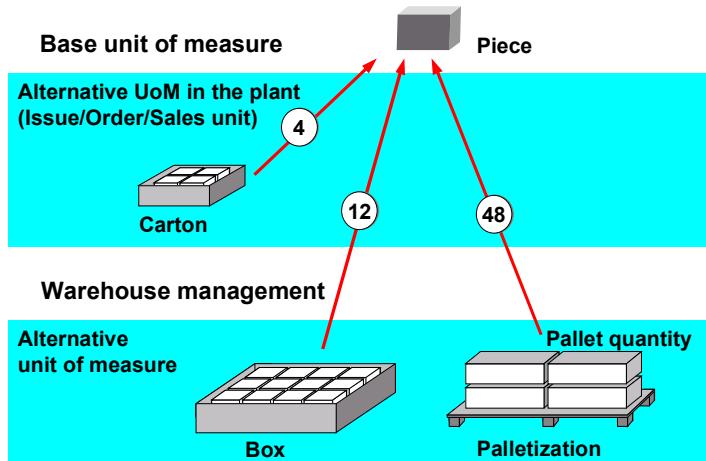
See also:

Blocking Bins in the Warehouse [Page 36]

Units of Measure

In the Materials Management (MM) component of the SAP System you can define several different units of measure (stockkeeping units) for each material that are all taken into consideration in WM.

The base unit of measure is the basis for inventory management and evaluation. Alternative units of measure, such as the order unit, issue unit or WM unit of measure, are defined to identify packages or containers for smaller units of measure such as cartons, boxes, bottles, barrels or pallets.

Base unit of measure   **Piece**

Alternative UoM in the plant (Issue/Order/Sales unit)

4

Carton

12   48

Warehouse management

Alternative unit of measure   **Pallet quantity**

Box   **Palletization**

Units of Measure used in WM

Base Unit of Measure

Quantities of warehouse materials (quants) are counted using the base unit of measure (UoM). Quantities in alternative units of measure are always converted to the base unit of measure for calculation purposes.

Stockkeeping Unit

The stockkeeping unit is synonymous with the base unit of measure. In the SAP System, the term "base unit of measure" is more commonly used.

WM Unit of Measure

The WM unit of measure (WM UoM) is an alternative unit which can be defined in the Warehouse Management view of the material master record.

Unit of Issue

The unit of issue (UoI) is a unit of measure generally used in Inventory Management for processing goods receipts and goods issues.

Other Alternative Units of Measure

Alternative units of measure can also be defined to identify packages or lager containers for smaller units of measure such as cartons, boxes, bottles, barrels, pallets (storage unit types) and so on.

Units of Measure

How can you implement the various units meaningfully?

The use of several different units of measure in the SAP system is useful, for example, for accounting, storage and packaging purposes. For example, if a crate contains several thousand pieces of a particular material, it is more expedient to purchase, package and sell this material by the crate or box rather than by the piece. Additionally, it is important to use units of measure that cause no field overflows to occur when the quantities are increased.

Alternative Units of Measure in the Material Master

Additionally, in the WM view of the material master record, you can define a loading quantity for each pallet type or storage unit type (SUT). You can enter this quantity using any unit of measure that has been defined in the system.

> A material is normally managed in kilograms. It is stored in the warehouse in sacks and is transported in large wire baskets. In this case, the base unit of measure is "kilograms"; the alternate unit of measure is "sack" (for example, one Sack = 10 kg) and you can define this in the WM view of the material master so that one wire basket contains 5 sacks or 50 kilograms.

The SUT is an important factor for the automatic stock placement strategy. The quantity to be putaway is divided by the quantity that is defined to fit on one SUT and is distributed for storage based on the strategy and capacity of the storage bins in the warehouse.

See also:

Posting Changes [Page 326]

Converting Alternative Units of Measure

Since the MM system uses the base unit of measure for calculation purposes, the WM application requires that a conversion be defined for any alternative units of measure that have been assigned to a material.

When you create a new material in the system, for example, if you designate "piece" as the base unit of measure and "box" as an alternative unit of measure, the system will display a conversion window which asks you to define how many pieces are contained in a box.

Default Quantity Units

The **default** unit of measure is the unit of measure that is selected by the system when you enter only a material number and quantity into the system. When you define a warehouse number you can designate primary and secondary default units of measure. These are then used by the system if you do not specify a unit of measure during a transaction. You enter them in the *1st default UoM* field and the *2nd default UoM* field in the *Quantities/Weights* section of the warehouse number record screen. If the primary default quantity unit is not maintained for a material, the secondary default quantity unit is used. If the secondary default quantity unit is not maintained for the material, the base unit of measure is used.

Using Units of Measure in Transfer Order Processing

You confirm transfer orders using any unit of measure that is allowed for the material. The system converts this into the alternative unit of measure and stores it when the transfer order item is processed.

In the data fields *1st and 2nd default UoM* in the warehouse number record, you can change the unit of measure proposed as a default by the system (i.e., if users do not enter a UoM). Units of measure from preliminary documents such as transfer requirements and deliveries are usually taken over by the system. Using the characteristic **M**, it is also possible to edit these documents automatically based on the WM unit of measure.

Units of Weight

During the planning stage, the transfer of materials, and the subsequent display of warehouse stock, WM supports all related alternative units of measure for processing. For example, if the weight of a particular material is managed in kilograms, the system can make calculations based on the input of weight measures such as grams, ounces, pounds or tons.

> It is important to use units of weight that cause no field overflows once WM has become active.

Batch Management

What is a batch?

A batch in the Materials Management system is defined as a subset or partial quantity of a material that is managed separately from other subsets of the same material. Each batch is identified not only by its material identification but also by a separate batch number. Typical examples of batches include different production lots (such as paints, dyes, wallpapers, and pharmaceutical products), delivery lots, or quality grades of a material.

When is batch handling used?

In the logistics process, from procurement to sales, it is sometimes necessary for you to specify batches for individual business transactions. For goods receipt transactions, you can manually specify a batch number or you can use the internal number assignment function. For stock removals from WM, the system searches for stock with the batches specified in the sales order or delivery.

Logistics-wide batch handling is possible in the following core areas:

- Batch definition

- Batch status management

- Batch determination

How do you distinguish between various batches in WM?

The essential features in Warehouse Management include the following:

1. There are two statuses in batch status management: **unrestricted** and **restricted**. The status is stored centrally in the batch and is classified as a characteristic of the batch. The system then uses this status during batch determination.

   When you process transfer orders, you should avoid transmitting batches with the status **restricted** during certain movements. This is determined by the entries in the movement type table.

2. A universal solution covering the whole of logistics was created for the batch determination complex whereby different areas use a central batch determination module. This module is divided into several sub-functions. The following steps are of importance to WM:

   – **Strategy**

   If a "batch neutral" quantity is requested when you create a transfer order to remove stock from storage, a "search pattern" in the movement type or in the warehouse number record specifies whether the batch determination is carried out or not. Based on the determination pattern, the system determines access sequences which, in turn, are linked to a search sequence. The system then selects a valid strategy for the batch determination.

   – **Selection**

   Via the classification system, the system finds batches according to predefined search criteria. Examples of possible criteria include shelf life and batch status.

   – **Sorting**

The system sorts any batches found according to certain criteria (for example, shelf life expiration date or the production date) and sends them to the program that creates the transfer orders. Here, the system processes the selected batches based on the stock removal strategies.

To make the settings mentioned above, see *Logistics - General → Batch Management → Batch status management → Activate batch status checking in Warehouse Management* in the *Enterprise IMG* documentation.

Batch Determination

You can use batch determination in the following applications:

Application	Function / Document
Inventory Management (IM)	Goods movements
Warehouse Management (WM)	Transfer order
Production Planning (PP)	Run schedule header & Production order
Production Planning (PP-PI)	Process order
Sales and Distribution - Sales	Sales order
Sales and Distribution - Shipping	Delivery

For more information, see see Batch Determination [Ext.].

Active Ingredient Processing

Active ingredient processing is integrated into the batch determination process in WM. For this process, the conversion factors for the individual batches are taken into consideration.

When you create transfer orders, the system displays the active ingredient unit of measure, however, it does not become the alternative unit of measure since this would not be appropriate for working in the warehouse. Therefore, you cannot use the active ingredient unit of measure for confirming transfer orders nor for taking inventory.

Shelf Life Expiration Date

The shelf life expiration date (SLED) for warehouse stock is established when goods are received. This date is updated in the quant, where it can be viewed and changed if necessary.

> For materials that are managed in batches, the shelf life expiration date is kept in the batch and cannot be changed in Warehouse Management (WM).

When shelf life management is active for a particular material, you must enter the expiration date on the stock placement preparation screen when you create a transfer order. The system can then print the shelf life expiration date on pallet documents.

You enter the shelf life data into the **storage view** of the material master record. This data includes:

- Maximum time a material can be stored

- Minimum shelf life a material must have available to be accepted by the system

- Percentage of the total shelf life that must still be available if the goods are to be sent to another distribution point

- Time unit used for the shelf life data (days, weeks or years)

- Total number of days that the goods can be kept – from production to the shelf life expiration date

See also:

Displaying Materials with a Shelf Life Expiration Date (SLED)

You use this task to select and list materials in the warehouse that respond to a user-defined remaining time before a given expiration date. This is known as the shelf life expiration date (SLED) control list.

This function is only meaningful when SLED management is active.

To display the shelf life expiration date control list

1. Choose *Logistics → Logistics Execution → Information System → Warehouse → Stock → SLED Control List* from the SAP menu.

2. You must enter the warehouse number as a minimum. Additionally, you can enter material, plant and storage type data.

    As selection criteria, you must enter the remaining shelf life in days. The system selects all materials whose remaining shelf is less than or equal to the number of days entered.

3. Choose *Program → Execute*.

Storing Materials in the Warehouse

The WM system manages both homogeneous and mixed storage.

Homogeneous Storage

Homogeneous storage is the storage of only one material number in a storage bin. You can define a storage type so that only one material can be stored in each available storage bin.

> Bulk storage areas are set up so that one line or block contains only one material number. For example, materials such as cases filled with beverages, bottled gas and pallets of cement blocks and other construction materials are stored homogeneously in bulk storage areas.

This method is preferable when large quantities of the same material are stored in a warehouse.

See also:

Stock Placement Strategy B: Bulk storage [Page 370]

Mixed Storage

When you define **mixed storage** for a storage type in your warehousing complex, it is possible to store two or more materials (quants) in each storage bin. There is no standard strategy in WM that automatically would place material together with another material that is already stored in a storage bin.

> Mixed storage is particularly useful when you have smaller quantities of several material numbers that need to be stored in the same storage area. Often, slower moving items are stored in mixed storage areas. Homogeneous storage would not be useful here, because that would mean that only a few boxes might be stored in each storage bin.

WM Interface to Inventory Management (IM)

The most important system component that is linked to WM is the Inventory Management (IM) application component. Most activities that take place within WM are initiated in IM.

Interim Storage Areas

The Inventory Management component communicates with WM through interim storage types.

> When you process a **goods receipt** in IM that is posted to a WM-managed storage location, the quantity is automatically posted to an interim storage area (goods receipt area). When this happens, a quant is created in a storage bin in the interim storage area. Afterwards, WM posts the goods to a storage bin in the warehouse. This second step can take place automatically. This increases the total stock quantity in both IM and WM.
>
> When you process a **goods issue**, the system posts a quantity to an interim storage area (goods issue area or shipping zone). This time, however, a quant with a negative quantity is created since the IM posting reduces the total stock quantity (see Goods Issue Based on an IM Posting [Page 236]).

It is through the interim storage areas that the stock quantities remain constant in both IM and WM. The total sum of the stock of all the WM storage areas for a warehouse number, both physical and logical, should always be identical to the sum of the stock in the IM storage location (see Comparing Stock Quantities in WM and IM [Page 129]).

How many interim storage areas do I need?

You need to decide how many and the types of interim storage areas to define and use. Generally, you need at least four:

- Goods receipt area
- Goods issue area
- Interim storage area for differences
- Posting change area

The interim storage area for differences manages stock differences that occur during stock movements. Data pertaining to stock differences (such as overages, shortages, and damages) is kept in the interim storage area until the conditions that led to the differences are resolved. Stock differences are cleared with a difference posting from the WM interim storage area to the IM component. (See Stock Differences [Page 185])

Additional Interim Storage Areas

You can also set up several interim storage areas for goods receipt and goods issue, depending on the requirements in your company. For example, you could define the following additional interim storage areas:

- Goods receipt interim storage area for purchase orders
- Goods receipt interim storage area for production orders
- Goods issue interim storage area for delivery documents

WM Interface to Inventory Management (IM)

- Interim storage area for posting changes

- Goods issue interim storage area for cost centers

This would make it possible for you to keep a record of each of the different types of documents and compartments completely separate at the storage type level.

How do I define an interim storage area?

You define interim storage areas the same way you define any other storage type in WM. You use the Customizing application to set up the storage types for each warehouse. Then you define the characteristics for each storage type.

See also:
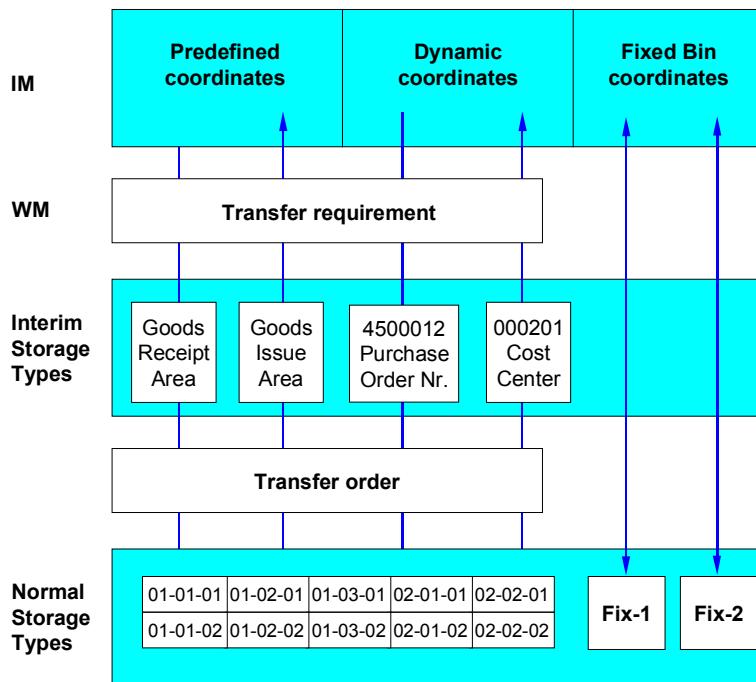
The Storage Type [Page 23]

Interim Storage Bins

When you define the interim storage area, you also specify the type of coordinate that will be used to identify the storage bins within the interim storage area. Storage bins for an interim storage area can have:

- Predefined coordinates

- Dynamic coordinates

- Fixed coordinates

The following graphic illustrates the use of all three types of interim storage bins.

IM	**Predefined coordinates**	**Dynamic coordinates**	**Fixed Bin coordinates**

| WM | **Transfer requirement** | | |

| **Interim Storage Types** | Goods Receipt Area | Goods Issue Area | 4500012 Purchase Order Nr. | 000201 Cost Center | |

| | **Transfer order** | | |

| **Normal Storage Types** | 01-01-01 01-02-01 01-03-01 02-01-01 02-02-01 | 01-01-02 01-02-02 01-03-02 02-01-02 02-02-02 | **Fix-1** **Fix-2** |

Predefined Coordinates

For each interim storage area, you can define one or several storage bins with fixed coordinates. For example, for the goods receipt area, you can create a fixed storage bin with the coordinates GR-AREA. You then assign a separate movement type to each storage bin in the interim storage area. You do this by entering the storage bin coordinates into the movement type record when you define the movement type.

> Before you can post stock movements using movement types containing storage bin coordinates, you must first create the corresponding interim storage bin in WM.

When you post a goods receipt in the IM component, the system uses the movement type to select which interim storage bin will receive the stock quantity in the interim storage area. On the other hand, when you post a goods issue, the system uses the movement type to determine from which storage bin in the interim storage area the stock will be removed.

Interim Storage Bins

See also:

Creating Interim Storage Bins with Predefined Coordinates [Page 125]

Dynamic Coordinates

When you define a movement type, you can set up the system to create dynamic storage bins in the assigned interim storage area. In this case, the system uses the document number which triggered the stock movement as the coordinates for the interim storage bin.

> For example, for a goods receipt, you can set up the system to use the purchase order number as the storage bin coordinates in the interim storage area for goods receipts.

These coordinates only exist as long as the quant is in the interim storage bin; afterwards, they are deleted.

Advantage of using Dynamic Coordinates

The advantage of using dynamic coordinates for goods receipts for purchase orders is that when several goods receipts are posted, these postings then create separate quants which can be differentiated using the purchase order numbers as coordinates.

If predefined coordinates are used, only the total quantity of the material in the interim storage area is visible.

Fixed Bin Coordinates

For a movement type, you can also assign a fixed storage bin that has been defined in the WM view of the material master record. You enter this storage bin coordinate in the *Storage bin* field in the storage bin stock section in the material master at the **storage type organizational level** (see Material Master Data [Page 98]). In this case, when you define the movement type you have to enter the storage type from the material master as an interim storage area in which the fixed bin has been defined. When the material is received in the warehouse, it is then posted directly to the assigned fixed bin. For the goods receipt posting, the system does not create a transfer requirement. In this case, none is required.

When should I use fixed bin coordinates?

You should use this procedure, for example, for fixed bin picking or in situations in which good system performance is important and when you can do without a return notification of the putaway.

Creating Interim Bins with Predefined Coordinates

Storage bins in interim storage areas must be created the same as bins in other storage types in Warehouse Management. Generally, interim storage bins are created when WM is installed (see *Generate interim storage bins* under *Interfaces → Inventory management* in the *Warehouse Management IMG* documentation). Later, when you define new movement types to which you want to assign interim storage bins, you can create these bins either manually (see Creating Storage Bins [Page 31]) or you can set up WM to create them automatically. In the latter case, carry out the following procedure.

1. Choose *Logistics → Logistics Execution → Master Data → Warehouse → Storage Bin → Create → For Interim Storage* from the SAP menu.

2. Enter a warehouse number and choose *Program → Execute*.

   The system checks all movement types in which you have defined an interim storage type and displays two lists. The first list contains storage bins that have not yet been created in WM. The second list contains storage bins that have already been created in WM.

3. Choose *Create bins*.

Order of Postings in Integrated WM

We can distinguish between two types of stock movements, depending upon the system that initiates the movement.

- The goods movement is posted first in IM and then carried out in WM.

- The goods movement is carried out in WM and subsequently posted in IM.

To accomplish these tasks, the system uses interim storage areas (see WM Interface to Inventory Management (IM) [Page 121] and Interim Storage Bins [Page 123]) for each interim storage area.

Sample Report

Report RLEXIP01 serves as an example to demonstrate how information that has been posted in the WM system can be completed by postings in the IM system. For detailed information about this report, see the online (extended help) documentation.

See also:

Posting First in IM [Page 127]

Posting First in WM [Page 128]

Comparing Stock Quantities in WM and IM [Page 129]

Posting First in IM

Example: Goods Receipt for a Purchase Order

Physical Process

When goods are received in a company, they are generally not transferred immediately to their final storage bin. Typically, goods are delivered to an interim (temporary) storage bin, such as a marked area on or near the receiving dock, where they are identified and sorted. They remain at that location until a suitable final storage bin can be found in the warehouse.

Process in the System

1. In the SAP System, you post the delivery of goods as a goods receipt in the IM system.

2. The system posts the stock to a storage location and creates a goods receipt document. This IM posting automatically updates the data about the location of the goods.

3. WM uses the goods receipt document to create a transfer requirement. This takes place automatically.

    The stock is noted in the system as being in a storage bin within an **interim storage area**. The quantity of stock recorded in WM is the same as the quantity of stock recorded in the IM system.

4. Subsequent to the goods receipt, you create a transfer order in WM using information from the transfer requirement.

    The transfer order initiates the physical stock movement. The goods are then transferred from the interim storage area to storage bins within the warehouse.

Posting First in WM

Example: Goods Receipt from Production

Physical Process

For this example, we use a manufacturer whose production department continuously produces materials on pallets. These are then transferred immediately from production to high rack storage shelves within the warehouse.

Process in the System

In this situation, the IM system is not informed each time a pallet is transferred from production to the warehouse. Instead, a posting that summarizes the goods receipt is made at regular intervals.

1. In WM you create a transfer order to transfer each individual pallet into the warehouse.

2. When you create a transfer order, the system posts a **negative** quantity to the interim storage area that is designated to receive material from production and a **positive** quantity to the destination storage bins in the warehouse, for example, in high rack storage.

3. Each time a pallet of the same material is received in the warehouse, the system increases the negative stock posting in the interim storage area (cumulative update).

4. Subsequently you start a batch program that reads the data from the interim storage area (for example, the quantities and material). This triggers the task for posting a goods receipt in the IM system.

5. When you post the goods receipt for the production order in the IM system, the system then updates the inventory data in IM and clears the negative quantities from the interim storage area.

Comparing Stock Quantities in WM and IM

The stock comparison function compares stock levels in the Warehouse Management (WM) application with stock levels in the Inventory Management component and searches for differences. To clear differences, you can create a batch input file.

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Physical Inventory → in Warehouse Management → Stock comparison* from the SAP menu.

2. In the first section of the initial screen, select data is to be compared for the stock comparison report. Permissible selections include:

   - Plant and storage location

   - Plant and warehouse number

   - Warehouse number only

3. In the output section of the screen, select one of the following additional fields to determine how the information is to be displayed or processed:

   With bin inventory

   If you select this option, the system lists the stock quantities at the bin level for Warehouse Management.

   All material data

   With this option you select all stock records for a material for which a difference is found. These records also include the material number, batch, special stock indicator and supplier combinations that have no differences and whose stock quantity is greater than zero.

   This detailed information helps in detecting exactly where the error occurred.

   Create batch input file

   If you select this output option, the system generates a batch input file. This batch input session adapts the stock figures in IM to those in WM.

   The prerequisite for this is that all goods movements to the corresponding warehouse number be blocked. If you only want to see a summary of the differences, we do not recommend using this option. It is best to clarify the causes of the differences first using the output list displayed on the screen before removing them using the batch input file.

4. Choose *Execute*.

Hazardous Materials Management

Although many materials that are classified as dangerous can be placed into storage along with other goods, some require special handling and placement into specially designed storage facilities. Some examples of these materials include:

- Explosives

- Petroleum fuels and oil

- Poisons

- Corrosive liquids

- Radioactive materials
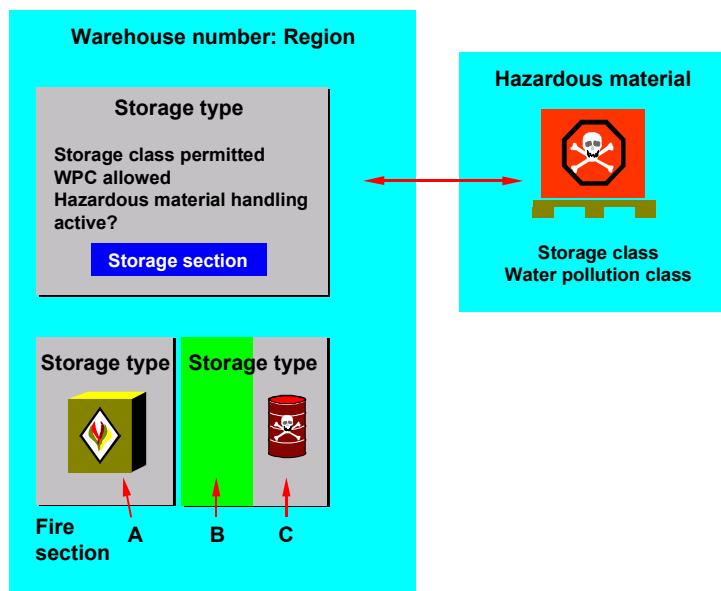
The SAP Warehouse Management (WM) application is designed to manage the handling and storage of hazardous material based on characteristics that are defined in the hazardous material record.

Hazardous Material Characteristics

Before you can use WM to manage dangerous goods, you need to maintain several hazardous material characteristics in the WM configuration tables. These include:

- Hazardous material warnings

- Handling instructions

- Aggregate stages

- Region codes

- Storage classes

Afterwards, you need to maintain tables that control how the system handles the placement of hazardous materials into the desired storage areas.

To maintain these characteristics and tables, see *Hazardous Materials* → *Master Data* in the *Warehouse Management IMG* documentation.

> Hazardous material characteristics and regulations that pertain to dangerous goods vary from country to country. Therefore, it may be necessary for you to modify the lists and data pertaining to hazardous materials available in the standard system to match the requirements of local and national regulations.

Hazardous Material Records

To designate a material in your warehouse as dangerous, you must first create a hazardous material record and then assign it to the material master record of the dangerous material. When a material master record is linked to a hazardous material record and the hazardous material storage checks have been activated, characteristics defined in the hazardous material record are then taken into consideration for storage type and storage section search.

Information about the hazards of handling and storing materials is generally the same for specific classes of material, for example, types of chemicals. The hazard features may also be similar. You store the general information about the material class in a single hazardous material record. You can then use one hazardous material record by all materials that share the same properties and characteristics.

See also:

Creating and Using Hazardous Material Records [Page 133]

Creating and Using Hazardous Material Records

The Warehouse Management (WM) system provides several tasks for displaying, implementing and maintaining information about hazardous materials. WM provides the following simple procedures for these tasks.

Creating a Hazardous Material Record

1. Choose *Logistics → Logistics Execution → Master data → Material → Hazardous material → Create* from the SAP menu.

2. Enter a number (or designator) and region code to identify the hazardous material and choose ENTER.

3. As a minimum, you must enter a descriptive text about the hazardous material. All other fields are optional.

4. To save the data to the database, choose *Hazardous material → Save* from the menu bar.

Assigning Material Master Records to Hazardous Material Records

You create the material master for a hazardous material using exactly the same steps as when you create any other material.

To link a material master record to a hazardous material record, you must enter the hazardous material record number in the *Haz.mat.no.* field of the Warehouse Management view.

See also:

Defining Warehouse Data in the Material Master Record [Page 99]

Displaying a Hazardous Material Record

1. Choose *Logistics → Logistics Execution → Master data → Material → Hazardous material → Display* from the SAP menu.

2. Enter the number and region for the hazardous material record and choose ENTER.

Displaying a List of Hazardous Material Records

1. Choose *Logistics → Logistics Execution → Information System → Warehouse → Stock → Hazardous material → List* from the SAP menu.

2. You can enter a range of hazardous material record numbers in the *Hazardous material* data field or you can leave it blank. If you leave it blank, all hazardous material records are retrieved for the region(s) selected.

    Choose ENTER.

3. To sort the records in the list by hazardous material record number, choose *Edit → Sort by haz.material* from the menu bar.

    To sort the records by region, choose *Edit → Sort by region* from the menu bar.

    To display the details of a hazardous material record, move the cursor to a hazardous material number and choose *Choose* from the application tool bar.

Creating and Using Hazardous Material Records

Modifying a Hazardous Material Record

1. Choose *Logistics* → *Logistics Execution* → *Master Data* → *Material* → *Hazardous material*
   →*Change* from the SAP menu.

2. Enter the number (or designator) and region code to identify the hazardous material record
   and choose ENTER.

3. Make changes to the desired fields.

4. To save the data to the database, choose *Hazardous material* → *Save*.

Deleting a Hazardous Material Record

You can delete a hazardous material record even if it is referenced by a material master record.
However, if you use a material that references a hazardous material record that has been
deleted, you will receive an error message when creating a transfer order. If you want to delete a
hazardous material record that is referenced, we recommend that you first determine which
material master records cite the hazardous material record and then delete or change the
reference in the material master record.

To delete a hazardous material record

1. Choose *Logistics* → *Logistics Execution* → *Master Data* → *Material* → *Hazardous material*
   → *Change* from the SAP menu.

2. Enter the number (or designator) and region indicator for the hazardous material record and
   choose ENTER.

3. Choose *Delete.*

Hazardous Material Evaluation Reports

To assist you in the management of hazardous materials, the Warehouse Management (WM) system provides several reports. You can display these reports online or you can print them as a list.

The following hazardous material reports are available in WM:

- Fire department inventory list [Page 136]

- Hazardous materials stored in the warehouse [Page 137]

- Hazardous substance list [Page 138]

Displaying the Fire Department Inventory List

This report displays a list containing information about hazardous materials in a specific warehouse number and/or storage type.

It is intended to be used by the local fire department and includes information about

- Storage class

- Water pollution class

- Water pollutants

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Hazardous material → Fire dept inv. list* from the SAP menu.

2. On the initial screen, you can select from options to retrieve a fire department inventory list for a range of fire containment sections and storage types within the warehouse or for the entire warehouse.

Checking for Proper Storage of Hazardous Material

To check whether the hazardous materials have been stored properly

1. Choose *Logistics → Logistics Execution → Information System → Warehouse → Stock → Hazardous material →Check Goods Storage* from the SAP menu.

2. Enter a warehouse number and choose *Program → Execute*.

For each storage type, this report lists the number of bins that were checked, the number of quants that were correctly stored and the number of quants that were stored improperly based on the hazardous materials storage parameters that were set up for your warehouse.

This report checks to see if hazardous materials are stored correctly. It identifies errors in the following situations:

*   When hazardous materials are stored in storage types managed specifically for non-hazardous materials

*   When a material cannot be stored in the desired storage type based on the water pollution class

*   When a material cannot be stored in the desired storage type based on storage class

*   When a material with a specified water pollution and storage class cannot be stored in the corresponding storage section based on the storage section search defined in the customizing application

Displaying Stock with Hazardous Substances

To display information about stock in the warehouse containing hazardous substances

1. Choose *Logistics → Logistics Execution → Information System → Warehouse → Stock → Hazardous Material → Haz.Substance List* from the SAP menu.

2. Enter the warehouse number. As an additional option you can also enter a specific storage type, range of storage bins and fire containment section. Choose *Program → Execute*.

The system displays a list of warehouse stock sorted according to storage type, fire section and material number.

Copying Hazardous Material Data from the Substance Database

You can also copy hazardous material data that is contained in the substance database into the WM hazardous material data table.

To do this, you need to determine which materials/real substances are to be copied into the WM table and how the data transfer is to take place into the fields.

If the field assignments between the substance database and the WM hazardous material table are incorrect, it could result in incorrect entries in the WM hazardous material data.

When you execute this program, a log provides information about the processing of the data transfer. This log includes information about any problems that might occur.

To customize the system for this function, see *Copy hazardous material from substance database* in the WM IMG.

You can only use this function when the substance database is active.

Warehouse Movements

Purpose

With the assignment of plant/storage locations in Inventory Management (IM) to the warehouse number in the Warehouse Management System (WM), the total stock balance between IM and WM remains the same when you post goods receipts and goods issues that result in stock quantity changes in the system. For these goods movements, two postings are normally required to complete the process – one in IM and one in WM. It is possible, however, to almost completely automate this process.

Several activities and key documents are included in the movement of goods in the warehouse. The most important of these activities and system documents are listed below. They are described in detail in other sections of this guide. They include:

- Goods receipt

- Goods issue

- Stock transfer

- Posting change

- Transfer requirement

- Transfer order

Features

Goods receipt

Goods receipts are inbound movements of stock that has been received as the result of a purchase order, production order and for other reasons. All goods receipts result in an **increase** in the total stock in IM and WM. The IM posting increases the total stock in IM and WM at the same time. In this case, WM has a "distribution" function to move the stock that was posted in IM from the goods receipt area to storage bins in the warehouse. For this purpose, a transfer order is created to determine the most appropriate storage bins. After the stock has been moved, the transfer order is confirmed.

Goods issue

For **goods issues**, the IM posting **decreases** the total stock in IM and WM. For example, the picking of goods for delivery to a customer is a goods issue in WM. In this case, WM has the function of finding the needed stock quantities in the individual storage bins in the warehouse and moving them to the goods issue area.

See also:

Goods Receipt [Page 193]

Stock transfer

The physical movement of materials from one plant or storage location to another, from one warehouse to another or from one storage bin to another in the warehouse is called a stock transfer in WM.

Warehouse Movements

Stock transfers within the warehouse (within the warehouse number) do not result in a change in the total stock and require only a posting in the WM system (for example, when moving stock from one storage bin to another). This process is not relevant to IM because the total stock in the system **remains the same**.

There is a difference, however, for stock transfers that involve the movement of goods from one warehouse to another, one storage location to another or from one plant to another. In IM you can post this kind of stock transfer either in one or two steps. However, you only need to make an additional posting in WM if the storage locations concerned are managed in WM.

> Consider a stock transfer from Plant 0001 Storage location 0001 (without WM) to Plant 0001 Storage location 0088 (with WM). In this case, WM must find storage bins for the stock that is transferred into the WM-managed storage location. For the removal of stock from storage location 0001, there is no WM activity. In this case, the total stock quantity in Plant 0001 does not change. The same applies to stock transfers from one plant to another: A second posting is required for WM managed storage locations.

See also:

WM Interface to Quality Management [Page 300]

Posting change

A posting change generally refers to a change in information about a particular material, for example when releasing stock from inspection. For most posting changes, the goods themselves remain in the same location and no physical stock transfer takes place.

See also:

Stock Transfers and Replenishment [Page 316]

Transfer requirement

Transfer requirements are used to plan and initiate stock movements. They represent an existing requirement that goods in the warehouse need to be moved.

Automatic creation of transfer requirements

Depending on the type of movement, transfer requirements are normally created automatically as a result of a transaction in another SAP component. The IM posting (for goods receipts, goods issues and stock transfers) generates most transfer requirements automatically. For material staging to production through the production planning (PP) interface, you can create transfer requirements by simply releasing the production order. You can also create transfer requirements manually using a transaction that was developed for that purpose.

> When a goods receipt for a purchase order is posted in IM, the system automatically generates a transfer requirement for the putaway. In this case, the goods are to be moved from the goods receipt area into the warehouse.

For a goods issue to a cost center, the transfer requirement contains an indicator for stock removal. In this case, the goods are to be moved from the warehouse into the goods issue area.

For the interface to Shipping (goods issue for a delivery), goods movements are not initiated by the transfer requirement, but rather by the delivery itself.

See also:

Transfer Requirements [Page 150]

Transfer order

The **transfer order** is the "trigger" for the actual physical putaway, pick or stock transfer in the warehouse. Transfer orders used in WM are "move orders" that contain all the information needed to carry out the physical movement of goods in the warehouse. WM can create transfer orders **automatically** for both transfer requirements and deliveries so that no intervention by warehouse managers is necessary.

Once the transfer order has been created, you can print it. The TO includes both the source and the destination bin of the movement, so that the physical stock transfer can take place. When an IM goods receipt posting takes place, the transfer requirement that is created as a result of that posting serves as a reference document for the creation of a transfer order. In this case, the goods receipt area is already known as the source storage bin and the system uses a putaway strategy (see Posting Changes [Page 326]) to search for a suitable storage bin in the warehouse. The system can also create a transfer order using a delivery as the reference document (see Goods Issues Based on a Delivery [Page 220]) or using a transfer requirement that was generated to supply materials to production (see Goods Issue for Production Supply [Page 242]).

You can also create transfer orders manually, for example, to move stock from one storage bin to another within the warehouse.

Negative stock

WM manages negative stock in interim storage areas. When movement transactions that require the use of interim storage areas take place, the stock balance between IM and WM must remain constant. The use of negative stock postings makes this possible.

For example, negative stock postings occur for a goods issue based on a transfer requirement (a negative quant is posted to the goods issue area) or when a goods receipt is posted in WM prior to the goods receipt posting in IM. For an explanation of these processes, see *Interim Storage Areas* under WM Interface to Inventory Management (IM) [Page 121],Goods Issue Based on an IM Posting [Page 236], Posting First in WM [Page 128] and Negative Stock Check [Page 211].

Movement types

As in IM, there are also WM movement types that influence the control of material flow. In WM the transfer order controls the movement and, therefore, contains information about the movement type. In WM, most movement types are determined automatically, either through the movement in IM (for example, goods receipt for a purchase order), or by a special transaction (such as, material staging in production). Usually, the movement types are automatically copied from the

Warehouse Movements

transfer requirement to the transfer order. It is only necessary to know and enter the movement type to manually create transfer orders for internal stock transfers.

Basics for Goods Movements

In the Warehouse Management system (WMS), there are two types of goods movements:

- Movements that affect only the warehouse, such as stock transfers within a warehouse

- Movements that affect not only the warehouse but also other departments, such as stock transfers to customers or to production

Goods movements in WMS are generally initiated by another system, such as Inventory Management (IM) or Sales and Distribution (SD).

Goods movement within the warehouse from one storage type to another

You use a transfer order [Page 159] to move materials from one storage type [Page 23] to another for each goods movement in WMS. You record all material information that is relevant for goods movements in the transfer order. The actual stock quantity and total stock quantity in the system do not change during goods movements within the WMS.

Goods movements involving interim storage areas

Goods movements involving inventory management (MM-IM) use **interim storage areas**. An interim storage area is a logical (and, in some cases, physical) storage area that is used to exchange quantity data between *Inventory Management* and *Warehouse Management*. Interim storage areas for goods receipts, goods issues, and differences are used to temporarily store data before it is posted to the storage areas in the warehouse.

For detailed information about interim storage areas, see WM Interface to Inventory Management (IM) [Page 121].

Movement Types in WM

Definition

The movement type is a classification key in the Warehouse Management system that describes a warehouse movement within a warehouse number.

Use
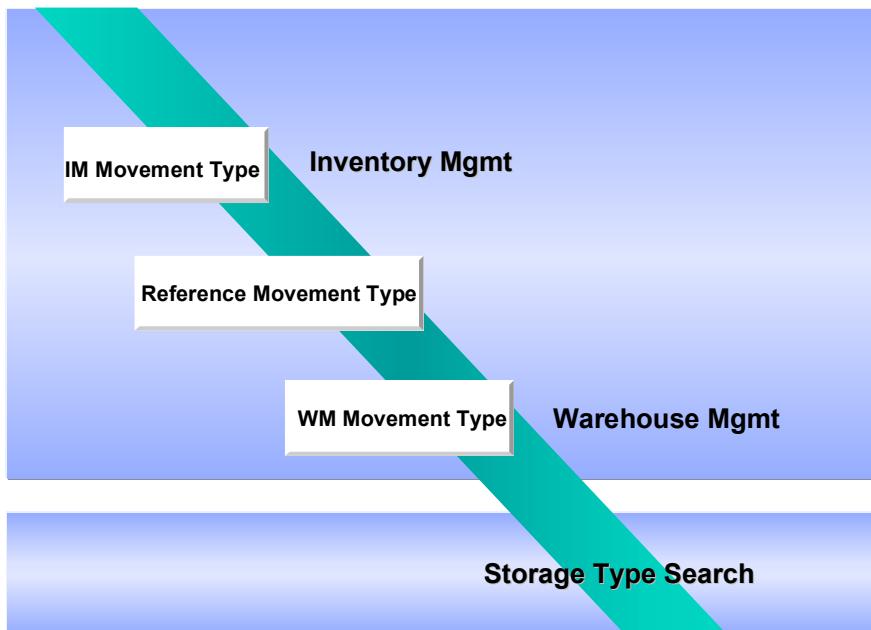
In Warehouse Management, goods movements are controlled through the movement type. Postings to inventory in IM are also identified by movement types. Together with other indicators, a movement type that is used for a goods movement in IM refers to a WM reference movement type.

The reference movement type provides the following information:

- Movement type for WM

- Stock category for the quants created by the movement

- Indicator controlling the creation of transfer requirements and posting change notice

WM movement types provide the following information that is needed to move stock into or out of the warehouse:

- Interim storage area

- Type of interim storage bin (predefined, dynamic, fixed)

- Control indicators for processing, confirming, and printing transfer orders

- Indicator for finding the storage type in the warehouse

Example

For example, in the standard system a goods receipt based on a purchase order is assigned movement type 101, while a goods issue to a cost center is coded as movement type 201.

Using the standard WM movement type 101, the system accesses the table in which the movement type is defined to determine how the goods receipt will be handled in WM.

> To display this movement type, choose the path *Activities → Transfers → Define Movement Types [Ext.]* in the Implementation Guide under *Warehouse Management*.

WM movement type 101 (Goods Receipt for Purchase Order) has the following characteristics and handles goods movements as follows:

- Since the goods are being transferred **from** the interim storage area, the source storage type is an interim storage area. In the standard system, it is defined as number 902 (Goods Receipt Area for External Receipts).

- The dynamic coordinate indicator (*Dyn*.) is set. This means that the system creates the interim storage bin coordinate using the same number of the document that triggered the move - in this case, the purchase order number.

- The type of document that is used to create the dynamic storage bin coordinates is defined in the *Requirement type* field as **B** (Purchase Order). This means that the system uses the purchase order number to build the coordinates.

When you post a goods receipt using movement type 101, WM will create an open transfer requirement with a positive quant in the interim storage area for goods receipts. Subsequently,

Movement Types in WM

when the transfer requirement is processed, WM creates a transfer order to move the goods from the interim storage area into a storage bin in the warehouse.

In the above example, the system uses the reference movement type 101 to access the table in which a reference movement type is assigned to a WM movement type.

> To assign an IM movement type to a reference movement type, choose the path *Interfaces* → *Inventory Management* → Define Movement Types [Ext.].in the Implementation Guide (IMG) under Warehouse Management.

In addition to the reference movement type, the system uses the settings for the warehouse number and the following indicators to determine the WM reference movement type:

- Stock special indicator

- Movement indicator

- Special stock indicator

- Special movement indicator [Page 147]

The entry of ******* in the *Warehouse number* column of the table indicates that the reference movement type is valid for all warehouses. The system finds that the movement type for WM (column *MTy*) is also 101. If the *TR* column is selected, it means that a transfer requirement will be created automatically by the IM component when the goods receipt is posted. This line also contains special indicators for stock and movements.

Using Special Movement Indicators

Use

It is possible to influence the movement of material within WM via the special movement indicators. You can assign another movement type in the Warehouse Management System (WMS) to a movement type from Inventory Management using this indicator.

Since you can specify interim storage areas and interim storage bins within the WM movement types, you can determine which interim storage areas and bins will be selected in WM for a goods movement depending upon the special movement indicator used. You can thereby actively influence the interface between Inventory Management (IM) and Warehouse Management (WM).

Prerequisites

In the Warehouse Management implementation guide (IMG), define the corresponding special movement indicators per warehouse number and assign these to a combination of warehouse number, reference movement type and Warehouse Management movement type.

1. For the definition of special movement indicators select the activity *Master Data → Material → *Defining special movement indicators [Ext.].

2. To assign special movement indicators (SpecMovementInd) to a movement type select the activity *Interfaces → Inventory Management →* Defining movement types [Ext.] → *LE-WM Inventory Management interface*.

You can still define a special movement indicator directly in the material master. You can thereby carry out particular goods movements via the IM-WM interface, for example, for a group of materials with similar characteristics (see example). You set the special movement indicator in the material master as follows:

1. In the SAP Menu, choose *Logistics → Logistics Execution → Master Data → Material → Change → Immediately*.

2. Enter the requested material for which you want to set a special movement indicator.

3. Choose *Goto → View Selection* and select the *Warehouse Management 1* view.

4. Enter the warehouse number (and the storage type if required) for which you wish to make the changes.

5. In the *storage strategies* area enter the corresponding special movement indicator.

Procedure

There are two ways to set the special movement indicators:

- Automatic retrieval from the material master

   If you have configured your system as described under *prerequisites*, this indicator is evaluated **automatically** and the corresponding activities carried out in the warehouse for a corresponding goods movement using the material for which the special movement indicator was defined.

- Manually

Using Special Movement Indicators

> If you have not set the indicator in the material master for a particular group of materials, which you want to post specifically in WMS for a specific goods movement, for example, you can set this indicator for an IM goods movement posting **manually** as follows:

1. On the access screen for goods movements choose *Goto → Warehouse Management → WM Parameters*.

2. Enter the special movement indicator in the following dialog box.

> If you manually set the special movement indicator when posting a goods movement in Inventory Management, the system ignores the indicator in the material master record and is valid for the total material document (that is, for all items).

Example

Moving stock directly to a fixed storage bin using a special movement indicator when posting goods receipts

Each time a goods receipt is posted for material ABC, you want to move the material directly to the fixed storage bin FIX-ABC in storage type 005 of warehouse number 001 without creating a transfer requirement or transfer order. To do this, you need to set up the system as follows:

1. Create the fixed storage bin FIX-ABC in storage type 005 that is defined in the standard system using the fixed bin search strategy. (See Stock Placement Strategy F: Fixed Storage Bin [Page 359])

2. Create a special movement indicator for your warehouse number.

3. Add the special movement indicator and the fixed storage bin FIX-ABC to the material master for material ABC. (Be sure to enter storage type 005 in the organizational level dialog box when creating the material master).

4. Create a new WM movement type to move materials directly into fixed storage bins without creating transfer orders or transfer requirements.

5. In the reference movement type table, create a new entry that links an appropriate IM movement type to the new movement type using the special movement indicator.

If you now post one goods receipt for material ABC in IM, the system neither creates a transfer requirement nor a transfer order. The posted quantity for the material is immediately increased in the fixed storage bin.
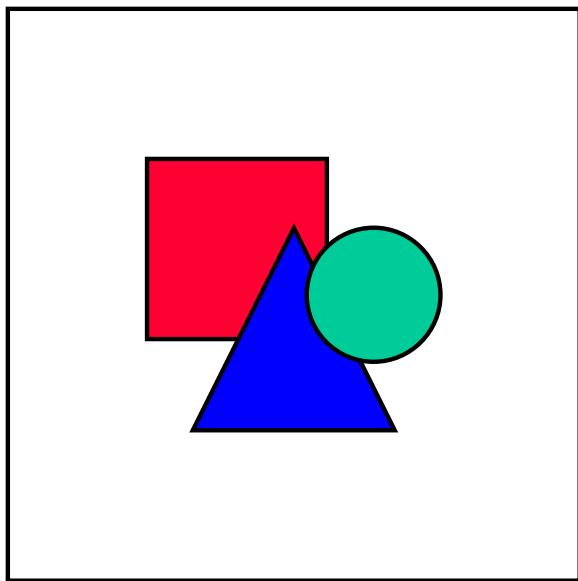
Moving stock directly to a production storage bin using a special movement indicator

When materials used in production are received, they are usually stored first in the reserve storage area and then retrieved when they are needed on the production line.

For a specific material or only for a particular goods receipt, it is also possible to enter a special movement indicator during the goods receipt posting (or retrieve it from the material master record).

For these exceptions, the transfer order uses a different movement type (based on the Customizing set up) than is normally used to find storage bins in the warehouse. This means that you can enter a special movement type to move a particular material directly to a production storage bin.

Transfer Requirement

Definition

This is a document that serves to plan goods movements using the *Warehouse Management System* (WMS).

By differentiating between the planning and execution of a goods movement, you can recognize immediately whether a goods movement needs to be still executed (transfer requirement is open), is currently being executed (transfer order is created), or is completed (transfer order [Page 159] is confirmed).

Use

On the one hand, transfer requirements are used to pass on information on goods movements that are posted in *Inventory Management* (MM-IM) to the *Warehouse Management System* (WMS). You can, however, also use transfer requirements for the following purposes:

- To initiate goods movements in WMS

- To initiate material replenishment for production storage bins in the production supply areas using the Production Planning (PP) component

- To call up transfer requirement reports in order to get an overview of all pending goods movements

On the basis of existing transfer requirements, the *Warehouse Management System* creates transfer orders, which, in turn, serve to execute the physical goods movements in the warehouse.

The system updates the transfer requirement:

- When you create, confirm or cancel a transfer order

- When you cancel a goods receipt or goods issue posting in Inventory Management (MM-IM) before the respective transfer order was generated in the *Warehouse Management System* (WMS).

    In this case, the system automatically reduces the transfer requirement quantity by the quantity to be canceled, or it deletes the transfer requirement altogether if the entire requirement quantity is to be canceled.

Structure

A transfer requirement consists of a transfer requirement header with general information and one or several transfer requirement items with material information (see the section Creating Transfer Requirements [Page 152]).

The transfer requirement contains all the necessary information on a planned goods movement.

- What should be moved?

- Which quantity should be moved?

- When should it be moved?

    The planning date is important for further automatic processing.

- Which transfer type is the basis of the goods movement?

    Each goods movement in the warehouse is classified by a transfer type indicator. This key differentiates between:

    - A stock putaway

    - A stock pick

    - A stock transfer

- Why is it to be moved?

    Was the transfer order created as a result of a purchase order or a production order, or was it created manually?

Creating Transfer Requirements

Use

Stock movements are planned and triggered via the transfer requirement. Transfer requirements form the basis for creation of transfer orders that are used to carry out physical goods movements.

Features

You can create transfer requirements

- **Automatically** by posting a goods movement in Inventory Management

- **Automatically** by requesting materials using the Production Planning system

- **Manually** using WM

You can create transfer requirements with or without reference to other system documents.

You can create a transfer requirement

With reference...	
to a material document	to move stock into or out of the warehouse
to a production order	to supply required materials to a production supply area
Without reference...	to move stock from one bin to another in the warehouse
	to request crate parts and release order parts to replenish their assigned storage bins in production supply areas
	to initiate the replenishment of fixed bins in WM

Transfer requirement updates

A transfer requirement is updated by the system

- When you create, confirm or cancel a transfer order

    Once you have confirmed the corresponding transfer order, the system updates the field for the open transfer order items in the transfer requirement.

    When the entire quantity of a transfer requirement has been processed by a transfer order, that is, all items have been processed, the system sets the *Header status* to E, meaning that the transfer requirement is completed.

- When you cancel a goods receipt posting or a goods issue posting in Inventory Management

    Sometimes when a goods receipt or goods issue posting is canceled in IM, an open transfer requirement exists for the quantity being canceled. This can happen if the goods have not yet been transferred in WM, that is, a transfer order has not been created. In this case, the system automatically determines if a corresponding transfer requirement exists. If it finds one, the system reduces the quantity in the transfer requirement by the quantity being canceled or deletes the transfer requirement if the entire quantity is to be canceled.

Example

Creating a transfer requirement in IM

A purchase order for material MATL1 is created in the Materials Management (MM) system. At a later time, the material MATL1 is received. When the material is received, you post goods receipt **in IM**. In this case, IM automatically creates a transfer requirement and updates both IM and WM data about the material. The quantity of the goods received is located at the goods receipt interim storage area, also known as the receiving area. Subsequently, the quantity of the goods is moved from the receiving area into the warehouse. The physical movement is carried out with a transfer order, which is created by the system using information contained in the transfer requirement.

Manual transfer requirement generation

A work center in the production department needs a quantity of an overhead costs material. In this case, the user manually creates a transfer requirement in WM. Subsequently, the quantity of the required material is moved from the warehouse to the goods issue interim storage area, also known as the distribution area. The physical movement is carried out with a transfer order, which is created by the system using information contained in the transfer requirement.

Creating Transfer Requirements

Use

Stock movements are planned and triggered via the transfer requirement. Transfer requirements form the basis for creation of transfer orders that are used to carry out physical goods movements.

Prerequisites

There are two ways of setting up the **automatic** creation of a transfer requirement:

1. Set the transfer requirement indicator (TR) in the table that links the reference movement types and the WM warehouse movement types. For more information, refer to the *Implementation Guide (IMG) for Warehouse Management*. (define movement types: Warehouse Management->Interfaces->Inventory Management->Define Movement Types)

2. Set the *Transfer requirement* indicator on the initial screen for posting goods receipts and goods issues in IM.

> It is not always necessary or useful to generate a transfer requirement for every posting in IM, for example, if the physical stock movement has already occurred. You can deactivate automatic transfer requirement creation by setting the *No transfer requirement* indicator.

Procedure

Normally, transfer requirements are created **automatically**. To set up this function, you will need to make the IMG customizing settings described above.

For goods movements such as internal movements you can also create transfer requirements within WM **manually**. The following cases, for example, allow for manual creation of transfer requirements:

- Goods issue for a cost center

- Manual supplies to production supply areas for pick parts

- Replenishment for fixed bins in WM

1. Choose *Logistics → Logistics Execution → Internal Warehouse Processes → Transfer Requirement → Create* from the SAP menu.

2. Enter a warehouse number and a movement type.

   Depending on the movement type, you may need to enter a requirement tracking number. The requirement tracking number is the number of the entity (document, cost center, ...) that caused the goods movement, such as a purchase order number or a cost center number. The system uses the number you enter to build the dynamic coordinate for the interim storage area, if a movement type has been defined for that purpose. (See Interim Storage Bins [Page 123])

3. From the initial screen, you have several options.

    – To enter general information about the transfer requirement, choose *Goto → Header*.

    – To enter information about an individual transfer requirement item, choose *Goto → New item*.

    – To enter information for several items in the transfer requirement, choose ENTER or *Goto → Input list*.

      The fields displayed, as well as their contents, depend on the movement type you entered on the initial screen.

      In the first section of the screen, the system displays the data that you entered on the initial screen. Based on the characteristics defined for the movement type, the system displays the source or destination storage type. Furthermore, the coordinates for the storage bin in the interim storage area have been predefined.

4. As a minimum, enter the material number and the amount of the material to be transferred. To save the data and create the transfer requirement, choose *Transfer requirement → Post*.

    The system returns to the initial screen with the message that the transfer requirement was created. The system also displays the transfer requirement number.

See also:

Processing Transfer Requirements

Use

On the basis of existing transfer requirements, the *Warehouse Management System* (WMS) creates transfer orders for executing the physical goods movements in the warehouse.

Procedure

Displaying a transfer requirement

1. Choose *Logistics → Logistics Execution → Internal Warehouse Processes → Transfer Requirement → Display* and one of the display types from the SAP menu.

2. Enter your selection criteria and choose ENTER.

   The system displays a list of all transfer requirements that meet the selection criteria.

   Choose *Processing status* for information about the transfer order.

Changing a transfer requirement

To change a transfer requirement or transfer requirement item:

1. Choose *Logistics → Logistics Execution → Internal Warehouse Processes → Transfer Requirement → Change* from the SAP menu.

2. Enter the warehouse number and the transfer requirement number.

   Select the appropriate menu functions to access the screen for changing information in either the transfer requirement header or in an item.

3. Save the changes.

Deleting a transfer requirement

You can delete a transfer requirement if

- no transfer order has been created (the status of the transfer requirement is "open")

   − OR −

- the transfer order created for the transfer requirement has been confirmed (the status of the transfer requirement is "completed")

After you have deleted all the items for a transfer requirement, the system automatically deletes the rest of the transfer requirement record.

You can also delete the entire transfer requirement from the header. The same conditions as those mentioned above apply for this action.

To delete a transfer requirement item or a transfer requirement:

1. Choose *Logistics → Logistics Execution → Internal Warehouse Processes → Transfer Requirement → Change* from the SAP menu.

2. Enter the warehouse number and the transfer requirement number. You can also enter the number of the item you want to delete.

   From the initial screen, you have several options.

   - To delete a transfer requirement, access the header screen by selecting *Header*. Then choose   *Transfer Requirement* → *Delete* from the *Change Header* menu bar.

   - To delete one or more transfer requirement items, choose *List of changes* to access the screen where all the items are listed.

3. Choose *Enter*.

   The system displays a list of all transfer requirement items.

   - Select the items that you want to delete in the *D* column. To delete the items, choose *Enter*.

   - You can also access a list of all transfer requirement items by choosing *Item overview*. Select the item to be deleted (for example, by moving the cursor to the item) from the list and choose *Edit* → *Delete item* from the menu bar.

   Regardless of the option you have chosen, the system displays a confirmation window.

4. To confirm the deletion, choose *Yes*.

   If you have selected several items, the system displays a confirmation window for each item.

   If the item is the only one in the transfer requirement, the system displays another window in which you confirm that you want to delete the transfer requirement.

Analyzing stock processed for TRs

There is an evaluation report available for transfer requirements. This evaluation report shows the percentage of quantities processed for each transfer requirement.

1. Choose *Logistics* → *Logistics Execution* → *Information System* → *Warehouse* → *Transfer Requirement* → *Document Overview* from the SAP menu.

2. As a minimum, you must enter the warehouse number on the selection screen. You can enter an individual transfer requirement number or a range of transfer requirement numbers or you can limit the selection to transfer requirements that are either open, partially transferred, or completed. After you have entered these additional selection criteria, choose *Program* → *Execute* to display the report online or *Program* → *Execute and Print* to both execute and print the report.

   The system displays or prints the list of selected transfer requirements.

Example

Creating transfer orders online

You may want to display all transfer requirements for materials in a specific storage type, such as the interim storage area for goods receipt, so that you can create transfer orders to transfer the goods into the warehouse.

For each transfer requirement that you select, the system goes to the overview screen for creating transfer orders for transfer requirements. To continue processing, choose *Transfer order* → *Post*. If you selected more than one transfer requirement, the system displays the next

Processing Transfer Requirements

transfer requirement for processing. Otherwise, the system returns to the list display screen. In both cases, the system displays a message that a transfer order was created. The system also displays the transfer order number. The system marks all transfer requirements that were successfully processed with an asterisk (*) on the list display screen.

Transfer Order

Definition

Document used for executing goods movements with the help of Warehouse Management (WM). Logical or physical goods movements or even stock changes can be the basis for a transfer order. These include:

- Picks

- Putaways

- Posting changes

- Repacking

- Inventory

Use

As a rule, you create the transfer order with reference to a source document from WMS or other SAP application components. A source document can be a:

- Delivery document

- Transfer requirement

- Material document

- Posting change notice

The transfer order contains all the required information order to execute the physical transfer of materials into the warehouse, out of the warehouse, or from one storage bin to another storage bin within the warehouse. In addition, it is also used for executing **logical** stock transfers. Logical transfers of stock occur, for example, when goods are released from inspection and made available for general use. These logical transfers are called posting changes in WM.

When you confirm a transfer order, you inform the system that it has been processed and that the goods have arrived at the intended destination (see the section on confirming transfer orders). If the planned quantity (target quantity) differs from the actual quantity of stock that is moved, a difference quantity exists. If you confirm a transfer order with a difference, the difference quantity is automatically posted to an interim storage type for differences (see the section on stock differences).

Once they have been carried out, transfer orders also have a control and monitoring function since they document movements in the warehouse (see Warehouse Controlling [Page 58]).

For certain inventory methods (for example, zero stock check, inventory based on putaway), transfer orders serve as inventory documents. In this case, when the actual quantity is confirmed (after the first putaway into a storage bin), it is updated in the system as the inventory quantity.

Structure

A transfer order contains all the necessary information on a planned goods movement.

- What should be moved?

- Which quantity should be moved?

Transfer Order

- From where (source storage bin) should the bin be moved, and whereto (destination storage bin)?

The transfer order consists of a transfer order header with general information and one or several transfer order items with material information (see the section on creating transfer orders).

Transfer Order Header

The transfer order header contains the transfer order number and the date that it was created and confirmed. It also identifies the transfer requirement or delivery on which it is based as well as the movement type.

Transfer Order Item

A transfer order can have one or several items. The number of items contained in a transfer order depends on how many storage bins the system accesses in order to reach the total quantity of goods needed for the picking requirement or how many bins are needed to store the goods (putaway).

A transfer order item contains subsections that specify the direction of the goods movement for each item.

- **Source storage bin**

  This subsection contains the source storage bin and the quantity of material that is being transferred. It indicates the storage bin from which goods are to be picked (goods issue) or an interim storage type (such as the goods receipt area) from which goods are taken to be put away in the warehouse.

- **Destination storage bin**

  This subsection contains the quantity of material that is being transferred and the storage bin into which the goods are to be put away. For example, it may contain a storage bin in a high-rack storage area that has been selected for a stock putaway, or an interim storage type (the goods issue area) for a stock pick.

- **Return storage bin**

  If, for example, you have the complete stock requirement set and you pick more stock than required from a storage bin, the system creates a subsection for the return storage bin. This can be the case, for example, when a complete pallet is removed from the shelf, but only a portion of the materials on the pallet is picked. In this case, the remaining quantity can either be returned to its original storage bin or transferred to another one.

Creating Transfer Orders

Use

To execute goods movements in the warehouse, you create transfer orders in the Warehouse Management System (WMS).

- You create a transfer order for an inbound delivery as soon as the supplier informs you of the scheduled delivery. The advantage of depicting the goods receipt process through the inbound delivery function is that you can execute many processes in advance even before the actual goods receipt posting takes place.

- You create a transfer order for an outbound delivery if you want to supply a delivery to a sales order for which you have previously created an outbound delivery in the system (see Goods Issue for Delivery [Page 220]).

- You create a transfer order for the transfer requirement whenever the transfer requirement has been created as a source document. This is the case, for example, if you post a goods receipt in Inventory Management (IM) or if a transfer requirement is created through the PP interface for production supply.

Prerequisites

One of the following source documents exists for a transfer order:

- Inbound delivery

- Outbound delivery

- Transfer requirement

- Posting change notice

- Material document

Features

When you create a transfer order (TO), the system determines all the bins in the warehouse that are affected by the goods movement (source storage bin, destination storage bin, and possibly also the return storage bin), and it automatically updates the storage bin data. The system also updates the respective fields in the document that was used to create the transfer order in the first place.

> In order to simplify the analysis of errors when searching for storage bins, it is possible to display a log of the internal processes that take place between the material master data and the storage bin search function. The system records a log of where it searched for the storage bins. To display the storage bin search log, choose *Environment* → *Stor.bin search log* from the preparation screen or the individual item screens when you create transfer orders for both stock picks and stock putaways.

You can create transfer orders (TOs) using different procedures.

Procedure	What You Should Know

Creating Transfer Orders

TO for inbound delivery	You can create transfer orders on the basis of inbound deliveries. For more information, refer to Creating a Transfer Order for an Inbound Delivery [Ext.].
TO for outbound delivery	You can create transfer orders either automatically or on the basis of outbound deliveries. For more information, refer to Automatic Creation of Transfer Orders for Outbound Deliveries [Page 230].
TO for transfer requirement	You can create transfer orders automatically on the basis of transfer requirements. For more information, refer to Automatic Creation of TOs for Transfer Requirements [Page 163].
TO for posting change notice	You can create transfer orders automatically on the basis of posting change notices. For more information, refer to Automatic Creation of TOs for Posting Change Notices [Page 329].
TO for material document	You can set up your system so that transfer orders are created immediately when you post material documents in the Inventory Management component. For more information, refer to Creating Transfer Orders Directly During IM Posting [Page 195].
Creating TOs using multiple processing function	The multiple processing task makes it possible for you to group several transfer requirements or deliveries together and process them all at once. Instead of processing each transfer requirement or delivery individually, you can select these documents from **a multiple processing list** and create transfer orders for them in a single transaction. For more information, refer to Multiple Processing [Page 273].
Creating TOs manually	You can also create transfer orders manually if you have a goods movement that only involves internal transfer of goods. Refer to the sections Creating Transfer Orders for Putaway Manually [Page 197] and Creating Transfer Orders for Picking Manually) [Page 241].

Automatic Creation of TOs for Transfer Requirement

Use

You can have transfer orders created automatically in the background by the system with reference to transfer requirements [Page 150]. The transfer orders are created independently of the deliveries.

Prerequisites

To have transfer orders created automatically in the background, you must first set the indicator *Automatic transfer order creation* for each respective movement type in the Customizing application for *Warehouse Management* under the path *Activities → Transfers →* Define Movement Types [Ext.]. The system automatically copies this indicator into the header item of the source document.

For more information on how to set up automatic transfer order creation for transfer requirements and posting change notices, refer to the IMG for Warehouse Management under the path *Activities → Transfers →* Set up Autom. TO Creation for TR/Posting Change Notices [Ext.].

Features

To activate the automatic creation of transfer orders for these **transfer requirements**, you must start the report **RLAUTA10** as a background job. For each occurrence of the indicator *Autom. TO Creation*, you must define a separate variant. This way, different starting times and repetition cycles can be defined for the different indicators. The following options are at your disposal:

*   The system creates a transfer order for each transfer requirement

*   The system creates transfer orders only for transfer requirements that meet certain criteria (for example, date or time). You enter these criteria individually into a user exit.

*   With the help of user exit criteria (see step 2) you can set up the system so that it groups transfer requirements under a group number and creates transfer orders for this group.

Using a Transfer Order as a Pick Order in Lean WM

Purpose

In Lean-WM [Page 44], you create transfer orders (TO) for deliveries to pick stock from fixed bins in the warehouse that are not managed by the WM system.

Transfer orders created with Lean WM instead of normal WM have the following characteristics:

- Confirmation of transfer orders is not required.

- Stock differences are reported to IM for processing. Handling differences is not possible in WM.

- You can transmit Lean WM transfer order data to external systems.

- Recording performance data, such as assignment to a picker, return confirmation of actual times or determining planned times is possible for this type of TO.

- If a transfer order has been created, subsequent changes to the delivery can be made in the *Pick Quantity* field. This is not possible in standard WM.

Prerequisites

You have set up Lean WM in your SAP System. For more information, refer to Setting up Lean WM [Page 46]. See *Logistics Execution → Shipping → Picking → Lean WM* in Customizing for a description of the different activities.

Process Flow

Generally, the processes used in Lean WM are similar to those in normal WM. There are deliveries and transfer orders are created for the deliveries. However, with Lean WM, it is much easier to create the transfer order.

1. Create a delivery as the prerequisite for the transfer order.

2. Create a transfer order for the delivery.

3. Post the goods issue.

Displaying Transfer Orders

Use

After you have created transfer orders, you can display them, either individually or grouped together according to various selection criteria. You can use the display tasks not only to display the data but also to select transfer orders in order to confirm them.

Procedure

The steps for displaying transfer orders are similar, regardless of how you want to select and group the transfer orders.

To display a transfer order, choose the following path under the SAP menu: . *Logistics → Logistics Execution → Internal Warehouse Processes → Stock Transfer → Display Transfer Order.*

Function	Menu Path	Procedure
Display a single document	→ *Single document*	Enter the transfer order number, warehouse number, and choose ENTER. You see the *item list* of the transfer order. Here you see the tab pages for *Source data, Destination data, General view.*
All other display types	→ *List* → *By storage type* → *By material* → *By storage bin* → *By storage unit*	Enter the required selection criteria and choose *Program → Execute.* The system displays a list of transfer orders that meet the selection criteria.

Details

To display details, choose a TO item.

To display an individual transfer order item from the list, move the cursor to an item and choose *Transfer order → Display item*. From the individual item screen, choose *Goto → Item → Item overview* to go to the *Item List* screen described above.

Print Transfer Orders and Labels

Use

Transfer orders and labels are printed for the purpose of identifying and moving stock from one location to another in the warehousing complex, picking stock and making preparations for shipping activities.

Depending on the settings in Customizing, the system normally prints transfer orders automatically when they are created. However, you can manually print out a single transfer order or a group of transfer orders in various formats. For example, a forklift operator can use the printout to identify pallets that are to be moved into the warehouse.

If a transfer order causes the storage bin to be inventoried (continuous inventory method), the system indicates this on the transfer order document. The transfer order can then be treated as an inventory document.

When the system prints the transfer order, it uses the default report that is defined for the warehouse. The reports RLVSDR40 "Print Transfer Orders" and RLKOMM40 "Print Combined Pick List" are delivered with the *Warehouse Management* (WM) application component.

Prerequisites

Controlling the printing process

To define the codes that control printing in WM, you need to maintain data in several tables in the Warehouse Management section of Customizing. The tables control where, when and how transfer orders are printed. To make settings for the objects (tables or table views) that control the printing process, see *Activities → Define Print Control* in the Warehouse Management section of the Implementation Guide (IMG).

Print code

The system branches to the print report when it creates transfer orders. In Customizing for Warehouse Management, you assign the standard print report that is to be used for each warehouse number. Each transfer order has a specific movement type. In Customizing you assign a print code to each WM movement type. Therefore, the system assigns a print code to each transfer order based on the movement type. When transfer orders are posted, the print code determines which and how many forms and/or labels will be printed and the spool code. As an additional function, for the combined list, the print code also determines the sort order of items within the printout.

> The sorting of TO items makes it possible to optimize the printing sequence. This pertains particularly to the TO items that can be sorted and picked from the same source bin. You can configure various sorting routines that exist in the standard system.
>
> Since the processing time for transfer orders (TO) is dependent on the sequence of the TO items, you can switch off the sorting function for TO printing, if desired.

Spool code

The **spool code** determines the spool parameters, such as the number of copies and when the transfer orders are to be printed.

Depending on the source and destination storage types for the stock movement, you can overwrite the form names and spool parameters for each transfer item.

Collective processing

The system determines how to print combined pick lists based on a table entry in Customizing. For this task, the system branches to the RLKOMM40 "Print Combined Pick List" report. You can also enter a printing status in a table that instructs the system to print individual transfer orders (TOs). In this case, the system prints transfer orders normally.

With report RLKOMM40, you can print both combined pick lists and individual items. The advantage of printing single items with RLKOMM40 instead of RLVSDR40 lies in the capability to sort transfer order items for release as a group at a particular time.

Features

Transfer order printing

Printed transfer orders contain all the information necessary for carrying out stock movements. Standard information includes the source and destination storage types and bins, material number and description, quantity, bar code, the date the transfer order was printed and the transfer order number.

Depending upon how you configure the system in Customizing, several options are available in addition to the standard information:

- You can print the personnel number and name for the entry of actual data in a transfer order.

- You can print shipping information such as the address of the goods recipient (see system tables VBLKK, VBLKB and VEKP).

- You can also print serial numbers if the transfer order is referenced to a delivery item that contains a serial number.

    ⚠️

    The system prints all serial numbers for a delivery item even when the delivery item is picked with several transfer order items.

- You can print production data as long as the transfer order is referenced to a production order. For this task, the system reads the corresponding reservations from table RESB.

- When you display transfer orders for groups, the sorting function of report RLKOMM40 dictates how pick lists are printed.

- For picking, you can configure single lists and combined lists to break them down into their individual requirement quantities. (This pertains to the totals line and corresponding individual requirements in deliveries and transfer requirements.) For example, you can print duplicates of lists as necessary.

- Additional requests from 2-step picking are taken into consideration.

- Customer exits allow you to access options in the standard system without having to modify existing programs for the printer search function.

Print Transfer Orders and Labels

- You can output printing information as an external sequential file.

Label printing

In addition to the transfer order documents, you can also print labels for individual transfer order items. The label-printing function is intended to support picking in the warehouse.

The following features for printing labels are available:

- From the printing transaction itself, you can use options to select how the system is to print the labels. These include following options:

    – Rounding quantity in alternative unit of measure

    – Rounding quantity in base unit of measure

    – Quantity in alternative unit of measure and the rest in the base unit of measure

    – One label per transfer order item (the quantity on the label is in the alternative unit of measure)

        You can also print individual transfer order items manually for large quantities. (See the example under field help for the *Large qty* field on the WM transfer order print screen.) This makes it possible for you to reduce the number of labels used for transferring large quantities of material.

        For example, many customers pick with label lists in which pickers label each package, pallet or unit to be moved. These are then sent through a sorting system that combines the various delivery items. This makes it necessary (depending on the settings in Customizing) to decide whether to print a label based on the unit of measure, transfer order item or the required quantity (for 2-step picking).

- Labels in the allocation step (2-step picking) also contain the group number.

- You can print labels for the picking step (if necessary).

- You can customize the printing of individual items, combined lists and labels.

Just as with the printing of transfer orders, before you print labels, you need to activate label printing in Customizing. See *Activities → Define Print Control* in the Implementation Guide (IMG) for Warehouse Management.

Printer determination

The system assigns a printer based on transfer order items (picked in a function module) according to the following hierarchy:

1. Manual entries always take precedence.

2. The printer is assigned based on the goods movement.

    a) The system checks first to see if a printer is assigned to a picking area.

    b) If there is no printer assigned to a picking area, the printer is copied from the source storage type table if it is selected in the goods movement.

3. If printer assignment information is not found, the printer in the user's master record is used.

4. If the printer in the user master record is not maintained, the system defaults to LP01.

5. For each warehouse number and selected printer, the system evaluates the printing of storage unit documents and labels from the printer-pool table. If no printers have been maintained in this table, the documents are printed on the transfer order printer (LP01).

The function module for printer determination is integrated in the transfer order creation function.

Storage unit documents

If Storage Unit Management is active in your system, you can also print storage unit documents. The SU documents that are available for automatic printing are listed in the Storage Unit Documents [Page 445] section.

Constraints

This function does not support any specific label printer. In other words, there are no printer-specific control codes for label printers. The system either prints in SAPScript format or issues output as a file.

Any additional print information that is not available in the standard system must be read in (or input using a scanner) using a customer exit.

You cannot print a separate document for a return item using the standard software. This can be done using a customer exit.

See also:

Printing Transfer Orders and Labels [Page 170]

Printing Transfer Orders and Labels

Printing a Single Transfer Order

1. In the SAP Menu, choose *Logistics → Logistics Execution → Internal Whse Processes → Stock Transfer → Print Transfer Order→ Single Print Transfer Order ...* or .... *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Inbound Delivery → Putaway → Print and Communication → Single Print Transfer Order.*

2. As a minimum, you must enter the warehouse number and the transfer order you want to print. If the system does not propose a default print code, you must enter a code in the *Print ID for condition lines* field.

3. To start the print process, choose *Transfer order → Print.*

Printing Labels

To print labels, select the field *Labels* on the initial print report screen.

The additional fields for large quantities make it possible for you to print labels for more than one unit at a time.

See the example under F1 field help for the field *Large qty.*

Using Groups to Print Several Transfer Orders

If you created transfer orders for multiple processing as a group, you can use the group number to print out all the transfer orders in a single list.

To print a group of transfer orders by a single group number or for a range of group numbers:

1. In the SAP menu, choose the path *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Communication / Printing → Reprint Picklist.*

2. As a minimum, you must enter the warehouse number and a group number or range of group numbers. If the system does not propose a default print code, you must enter a code in the *Print ID for condition lines* field. To display a list of print codes available for the warehouse, position the cursor in the *Print ID for condition lines* field and view the *Possible entries*.

3. From the selection screen you have several options, depending on the setting of the *Print list (otherwise display)* indicator and the function you select.

   a) To display a list of the group numbers that meet the selection criteria:

   – Select the *Print list (otherwise display)* field.

   – Choose *Execute.*

   Choose *Display details* or *Display summary* to display the transfer orders assigned to the group numbers. You can do this only if the report has been sent to the printer.

   b) To see the format of transfer order print out before you print it:

   – Deselect the *Print list (otherwise display)* field.

   – Choose *Execute.*

  c) To print the transfer orders or labels

  – Select the *Print list (otherwise display)* field.

  – Choose *Program* → *Execute + print.*

   The system displays a screen with default values for printing, such as the printer, number of copies, spool request name, and spool control parameters. You can change the default values in most of these fields.

4. To continue, choose *Execute + print.*

 The system displays information about the spool request. You cannot change any of the data on this screen.

Totals Line

When you print multiple processing pick lists, you can print a totals line for materials that need to be picked from the same storage bin.

Since it is only possible to pick several times from the same storage bin using the multiple processing task, this function is only active for printing multiple processing pick lists (report RLKOMM40 and function module (L_PRINT_TO_MULTIPLE_REF).

Instead of changing settings in customizing, you decide whether the totals line will be printed based on the print form you select.

The technical process is as follows:

1. In the program, the system analyzes the form based on the element "SUM" in the window "MAIN".

2. If this exists, the system internally adds the quantities together and the source item of the transfer orders is printed together with the totals line.

3. Afterwards, the system prints the individual destination items. You print the list using the form "LVSPICKLIST".

Evaluating Transfer Orders

Use

Warehouse Management provides several reports that enable you to summarize the data from a number of transfer orders and display or print the information in a report format. The steps for using the reports are similar for each report.

Procedure

1. In the SAP Menu, choose *Logistics → Logistics Execution → Information System → Warehouse → Transfer Order* and one of the menu items.

2. Enter values in the selection criteria. Choose *Execute* if you want to display the report; choose *Execute and print* if you want to print the report.

   If the report you select displays individual transfer orders or transfer order items, you can access the display task for transfer orders by moving the cursor to the individual item and choosing *Display transfer order*.

The following reports (evaluations) are available.

- To display the number of movements from one storage type to another, choose *Movements/storage type*.

- To display transfer orders choose *Document overview* or *Detailed overview*.

- To display differences summarized by storage type and transfer type, choose *Differences for TO*.

- To display the number of times material moves to or from a storage type, choose *Material movement frequency*. This report is useful for determining whether a material should be in a fast-moving or slow-moving storage area.

Confirming Transfer Orders

Use

When you confirm a transfer order or a transfer order item, you are verifying that the required quantity of material has actually been transferred from one location to another and that the processing of the transfer order or item has been completed.

> If confirmation is required, the quantity of material transferred into or out of the warehouse is not available for use until the transfer order or item has been confirmed.

Prerequisites

1. You can set the **confirmation requirement for a storage type** by choosing the following settings in the Implementation Guide (IMG) for *Warehouse Management*:

    −   To set the confirmation requirement for putaway, select the *stock placement requires confirmation* indicator.

    −   To set the confirmation requirement for picking, select the *stock removal requires confirmation* indicator.

        You can set these indicators by choosing *Master Data* → Define Storage Type [Ext.] and selecting the relevant storage type. We recommend that you set the confirmation indicators for most of the storage types in your warehouse.

        After you set these two indicators, warehouse workers must confirm every physical transfer of material to or from the storage type. Although confirmation requires the warehouse worker to take additional steps, it provides a high degree of security and accuracy for data about the goods in the warehouse.

2. You can set the **confirmation requirement for a movement type** by choosing *Activities* → *Transfers* → Define Movement Types [Ext.] and selecting the relevant movement type.

    −   To set the confirmation requirement for foreground processing, select the indicator for *TO item can be confirmed immediately*.

    −   To set the confirmation requirement for background processing you will also need to select the *Propose confirmation* indicator.

Features

You can confirm transfer orders

*   manually

*   automatically

*   using a scanner

You can use one of several tasks to confirm transfer orders manually. Normally you would call up the confirmation task directly. However you can also use the display tasks for transfer orders to access the confirmation task. You can use a scanner to read the information into the initial

Confirming Transfer Orders

confirmation screen. For instructions on how to confirm transfer orders, see <u>Confirming Transfer</u>
<u>Orders [Page 175]</u>.

Differences

You process differences when confirming a transfer order. This results in the update of the stock
levels in WM. Afterwards, you need to clear the WM differences in IM.

Processing Options

You can specify that you want to monitor the confirmation process on your terminal or that you
want the confirmation process to run in the background. If you use the confirmation task for
individual transfer orders or items (the first option described above), you set the
Foreground/Backgrnd field to **H** (foreground). If you use display tasks, you select the desired
option from the menu bar for the task. Usually these options are identified as *Confirm in foregrnd*
(foreground) and *Confirm in backgrnd* (background).

Confirming Transfer Orders

Procedure

Confirming the TO manually

1. To confirm a transfer order (TO) manually, choose *Logistics → Logistics Execution → Internal Warehouse Processes → Stock Transfer → Confirm Transfer Order → Single Document → In One Step* from the SAP menu*.*

   To confirm a single transfer order **item**, choose *Logistics → Logistics Execution → Internal Warehouse Processes → Stock Transfer → Confirm Transfer Order → Single Item → In One Step* from the SAP menu*.*

2. Enter data as required.

   You can specify whether the transfer order is to be processed in the foreground (H) or in the background (D). For more information, see Foreground/Background Processing [Page 51].

   If the *Close TR* indicator is selected, the system regards the underlying transfer requirement as closed when the TO is confirmed and sets the header status to **delivery completed**. This prevents transfer requirements from remaining open when you want to close them. If you do **not** select this indicator the transfer requirement will remain open if the processed quantity is less than the required quantity.

3. Choose *Enter*.

   Depending on the processing option you selected, the system will either report that the transfer order has been confirmed (background processing) or display an overview of all TO items (foreground processing).

   If your system settings require entering actual data [Page 183], a dialog box appears for this purpose.

   If you choose *Input List* on the initial screen, the system displays the following tab pages:

   * *Active work list*

   * *Inactive items*

   * *Items confirmed internally*

     The system transfers each item that has been processed to the *Confirmed internally* tab page*.*

     The status **confirmed internally** means that the confirmation has not yet been posted. If you exit the transaction before saving the transfer order, the internal confirmation will be lost and the items will be returned to the *active work list*.

   * *Confirmed items*

     The system transfers all items for which confirmation has been saved to this tab page.

4. To confirm the items that are in the active work list, choose *Edit → Confirm internally*.

5. For final confirmation of the transfer order choose *Transfer order → Post.*

Confirming Transfer Orders

If you set the indicator for *Destination bin change during confirmation* for the desired storage type in Customizing for Warehouse Management under *Logistics Execution → Warehouse Management → Master Data →* Define Storage Type [Ext.], you will be able to change the destination bin when confirming a transfer order if, for example, the destination bin proposed by the system is damaged.

No destination bin can be entered during confirmation for

−   dynamic coordinates

−   return items

−   Lean WM (if the destination bin is defined in the movement type)

−   posting change TOs

−   inventory based on putaway

−   additions to existing stock in storage units

−   transaction *Confirm single item*

Confirming the TO from the display list

1. Choose Displaying Transfer Orders [Page 165] to confirm transfer orders with the TO display task.

2. Choose *Confirm → Transfer Order* to confirm all items of a transfer order.

    To confirm individual transfer order items, select the relevant items and choose *Confirm → Item*.

    This is useful if you do not remember a specific transfer order or when you want to confirm several transfer order items within the same task.

Confirming the TO using a scanner

When you confirm transfer order items with bar codes, you can either enter the items manually or use a bar code reader. The system automatically copies the transfer order number into the initial screen of the *Confirm transfer orders* transaction.

Packaging Notification to Shipping

For transfer order processing, Warehouse Management (WM) is linked to the packaging functions in shipping.

Creating a transfer order – packing proposal

When you create a transfer order (TO) for a delivery, you can call up a customer exit using a shipping routine. This customer exit then finds a packing proposal for the TO items. The system then suggests what is known as free packaging with reference to the TO header.

Free packaging means handling units (HUs) without contents. This means you are not assigning specific transfer order items to the handling units. You can print the handling unit information on the transfer order documents. Pickers can then use this information to decide which and how many shipping containers (pick HUs) they need to organize for picking.

Confirming a transfer order – packaging notification

When you confirm a transfer order for a delivery, you can branch to the data entry screen for packaging:

1. From the TO item overview screen, choose *Edit → Pack ship.unit*.

   This takes you directly to the packing screen in the shipping system for this delivery.

2. Enter the appropriate data in the packing information fields.

   When you make an entry in these fields, you are simply saying, for example, "I used two standard pallets for these materials".

   If you are working with the packing proposal described above, the system suggests the handling units described in that proposal.

   Otherwise, you can enter handling units without reference to transfer order items.

3. Once you have created handling units for a TO item, you can return to the item overview list in Warehouse Management (WM).

Result

When you post the transfer order confirmation, the system updates both the handling units and the quantities in the delivery. Here, too, these are what we refer to as free packaging (without contents). Now you can assign delivery items to the handling unit in shipping.

Cancelling Transfer Orders

Use

If, for example, you decide to cancel a delivery for which the transfer orders have not been confirmed yet, you first need to cancel the transfer order related to this delivery. This step is always necessary for cancelling a delivery. You cannot cancel transfer orders created from posting change notices.

If a transfer order has already been confirmed, the only way to change a goods movement to restore the original stock situation is to create a new transfer order. For an exception to this rule, see Creating a TO for a Cancelled Delivery [Page 235].

When you cancel a transfer order, inventory activities associated with such transfers (such as continuous inventory during stock placement or zero stock checks) are reversed. Additionally, the system removes all updates in the relevant reference documents and storage bins.

Procedure

To cancel transfer orders

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Stock Transfer → Cancel Transfer Order→ Single Document* from the SAP menu.

2. Enter the transfer order number and the warehouse number on the initial screen and choose *Enter.*

    The next screen features three tab pages:

    – *Active work list*

    – *Inactive items*

    – *Confirmed items*

    Depending on the setup made in customizing for the confirmation screen and the movement type, the system may not display all three tab pages. For example, when you move a complete storage unit within the warehouse, the system only displays the active work list and the internal confirmation list. Since you are moving the entire storage unit, there is no selection column for individual items.

3. You can select items that you do not want to cancel in the active worklist and send them to the inactive items list by selecting the *Inactive* button. To cancel the transfer order items in the active work list, choose *Transfer order → Post*.

Transfer Order Split

Use

Sometimes, it is useful to divide the tasks of putaway and picking into smaller jobs. On the one hand, it is important to distribute the work evenly among warehouse workers, while, at the same time, making sure that these tasks are completed in a timely manner. The transfer order (pick list for goods issues or the goods receipt list) determines the actual quantity of work that needs to be accomplished.

By splitting large quantities of stock items that are available for picking or putaway into several transfer orders, as opposed to one very large transfer order, it is possible to distribute the workload evenly among warehouse workers and optimize the stock handling functions. This way, each worker periodically receives only one list for his or her responsibilities (goods receipts, goods issues or stock transfers).

It is important to understand that, although the term "split" is used here, an **individual item** within a transfer order **is not split** into smaller items, regardless of the quantity in that item. The items are not changed. Instead, the items within a single transfer order are distributed (spread out) among two or more transfer orders.

Prerequisites

In the Customizing application, you can define whether a transfer order split is to take place and select a mix of detailed criteria that affect the split. A customer exit is also available to define your own criteria for this task. For instructions on how to set up your system for the TO split, see *Activities → Transfers → Processing performance data / TO split → Define profiles* in the *Warehouse Management IMG* documentation.

Features

The following transfer order split capabilities are available.

- *Split according to movement unit* is viewed as a separate function that is processed independently from the other split criteria.

    For each movement unit (SUT in an item) a split is planned. The TO contains an item with exactly one movement unit. The split is necessary when the actual data is recorded and plays a role in the calculation of the planned times. Based on the Customizing definition, you can switch off the split function and decide to use the standard process.

- Sorting items in the transfer order.

    The items in the TO are sequenced so that the document created for the TO lists the storage bins from which materials are to be picked in an optimal sort order for processing. The routes are minimized and, consequently, the planned and actual processing times. An additional field in the storage bin defines a sequence for all bins in the warehouse. The customer maintains this field.

- Transfer orders can also be split according to the following criteria:

    – Storage type/section

    – Planned transfer order processing time

Transfer Order Split

- – Quantity of containers / weight / volume

- – Mix (combination of named criteria)

It is also possible to assign a separate printer for each work area. That way, all materials that need to be processed in a specific area can be combined and printed in a single list on the assigned printer.

> Note that the volume is calculated based upon the alternative unit of measure. A box with 10 bottles, for example, can have a different volume than 10 times the volume of one bottle. IF the volume for the alternative unit of measure has not been defined in the material master record, the system uses the volume from the base unit of measure for its calculation.

Performance Data

Performance data used in the Warehouse Management (WM) system is contained in the transfer order header and includes both planned and actual data.

Terminology that is used in conjunction with SAP's Warehouse Management system includes the following:

Planned data

Planned data is previously calculated target data that pertains to the processing of a WM transfer order. This data includes:

- Volume

- Weight

- Transfer order processing time

    The planned TO processing time is the target time or the time that is expected (planned) for a worker to process an entire transfer order containing one or more items.

Actual data

Actual data is the actual information about how a transfer order was processed. This data includes:

- Worker (personnel number)

- Duration (actual time required to process the transfer order)

- Start date and time and end date and time

- TO processing comment code

Planned Data

Planned workload data with respect to a transfer order refers to the calculation of the expected or target time that is required to carry out a movement in the warehouse. This is referred to as the **planned processing time** for a transfer order.

Use

This task can be used for the following purposes:

- Basis for controlling the internal workload

    When combined with the actual data, the planned processing data provides a basis for the evaluation of the overall workload in the warehouse.

- Calculation of incentive wages

    Together with the actual data (which includes the worker who processes the transfer order) the planned workload can be transferred to Human Resources (HR) through an interface. In that component, the system can use this information to calculate incentive wages (for pickers, for example).

Prerequisites

Settings in Customizing make the calculation of planned processing times for transfer orders very flexible. When transfer orders are created, the system uses two formulas for this calculation – one for transfer order items and one for the transfer order as a whole. These formulas take the material, the stock quantity, the unit to be moved and the geographical location in the warehouse into consideration.

For information on how to set up your system to implement this task, see the appropriate section under *Activities → Transfers → Processing Performance Data* in the Warehouse Management section of the Implementation Guide (IMG).

Entering of Actual Data

Use

You can use this function to assign transfer orders to a worker in the warehouse and enter the actual time that was required to process them.

You can use actual data for the following purposes:

- Controlling the processing of transfer orders

    You can assign transfer orders to a worker (personnel number) for processing.

- As split criteria

- Entry of processing times as statistic information

    The actual processing data can be compared with the planned data.

- Basis for determining incentive wages

Integration

If you use the actual data as a basis for determining incentive wages (for pickers, for example), the actual data is transferred to the Human Resources (HR) component along with the planned data. The system transmits this data using report RLT1HR00. The worker and the target time (planned time) are mandatory input for incentive wage calculation in HR.

We recommend that you run this report as a background job at regular intervals (once daily, for example).

You can also transmit this data **manually** by choosing *Environment → External systems → Performance data to HR*.

> If data errors occurred during the last batch run, you can start this function manually to transfer the corrected data to HR.

Prerequisites

Before you can use the actual data, you must make several settings in Customizing. For more information, see *Activities → Transfers →* Processing Performance Data/TO Split [Ext.] in the Warehouse Management section of the Implementation Guide (IMG).

Features

You can enter the following **actual data** in the transfer order header.

- Worker (HR personnel number)

- Start date and time and end date and time

- Actual duration

    The actual duration is the net duration of time that is required to process a transfer order.

Entering of Actual Data

You can enter the start and end time points or the actual duration into the system. You can also omit these entirely.

- TO processing comment code

  This code provides information entered by the worker about the processing of a transfer order. This code is linked to a long text. It can be used to explain why the processing of a transfer order took longer than expected. It **must** be entered if the actual time required to process a transfer order exceeds a predefined limit.

  Examples that could be used in the TO processing comment code fields may include:

- SHBR   Broken shelf

- NRA   No replenishment available

- LB   Lunch break

- LDEQ   Loading equipment failure

Handling Differences

Use

It is possible that you discover stock differences in your warehouse, for example, during inventory or when you are executing a stock transfer.

- In a stock transfer, you confirm more goods or less goods than provided for in the transfer order.

- Goods turn up at an expected location.

- A storage bin is discovered to be empty although there should actually be material in it.

Prerequisites

You have assigned the difference indicator for storage bins in Customizing for *Warehouse Management* under the path *Activities* → Confirmation [Ext.]. Here you define to which storage type and storage bin the stock difference is to be posted. There are three different ways to specify storage bins for a difference indicator:

- You assign a pre-defined bin coordinate.

  The system debits the specified storage bin with the difference in the column *Diff.SB*.

- You assign a dynamic bin coordinate.

  If you set the indicator TO, the system generates the storage bin coordinate on the basis of the transfer order number, should a difference occur during confirmation.

- You assign the source storage bin as a bin coordinate to the transfer order item.

  If you set the indicator *Srce bin*, the system debits the source storage bin of the movement type with the stock difference.

  If the source storage type does not allow negative stock balances, the system checks whether the stock balance is going to be negative (see Negative Stock Check [Page 211]).

  If you use this type of difference indicator, the transfer order item cannot contain a return quantity. Furthermore, you cannot use this difference indicator for stock picks from bulk storage areas.
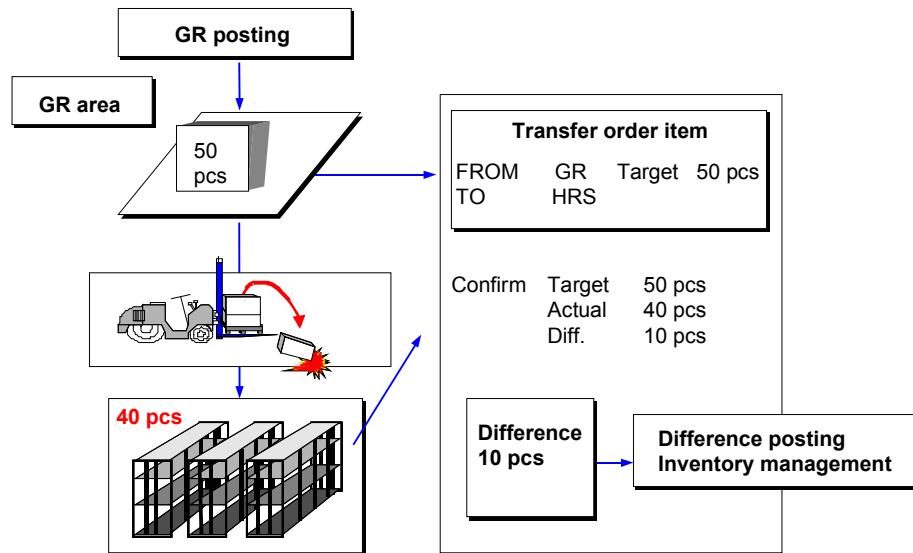
Features

In the *Warehouse Management System* (WMS), you can classify stock differences by cause (for example, breakage, theft) using the difference indicator.

If you determine discrepancies during the confirmation process, you post the difference quantity to a **logical** interim storage type. The interim storage type is **not** a physical location since it does not occupy space in a warehouse; it serves merely as a type of clearing account.

In order to ensure that you have the same stock levels in Inventory Management (IM) and Warehouse Management (WM), you must pass on to Inventory Management all the stock differences that you determine in WM and subsequently correct them using the difference storage type (see also Clearing Differences [Page 187]).

Handling Differences

In the standard version of the *Warehouse Management System* (WMS), the following two movement types are defined for handling differences:

- For differences where the quantity does not exist in the storage bin but is recorded in the books, use movement type **711**. In this case, the difference must be cleared from the warehouse and posted to the interim storage type for differences.

- For differences where the quantity does exist in the storage bin but is not recorded in the books, use movement type **712**. In this case the difference must be cleared from the interim storage type for differences and posted to the warehouse.

As soon as you have confirmed the transfer order item, the system posts the difference to the storage bin that has been specified for the respective difference indicator.

Activities

You create a transfer order with a movement type that is provided for handling differences. The system posts the respective quant to the interim storage type for differences.

After you have posted the difference quantity to the interim storage type for differences, you can clear it from there as an inventory difference and then post the quantity to inventory management.

Clearing Differences

Use

You must clear all the stock differences [Page 185] that you have corrected in the Warehouse Management system (WMS) from the WMS and then report them to inventory management (MM-IM).

Procedure

To clear stock differences between inventory management and WM:

1. In the SAP Menu, choose *Logistics → Logistics Execution → Internal Whse Processes → Physical Inventory → In Warehouse Management → Clear Differences → Inventory Management.*

2. At the very least, you must enter the warehouse number and the storage type for the interim storage area.

   There are also several other indicators and selection criteria available to limit the number of items displayed.

3. Choose *Program → Execute.*

   The system displays a list of stock differences. All differences are marked (**X**) by default in the *S* column, meaning that they are ready to be cleared. You can deselect items in the list and select only those differences that you want to process. The selection functions are available in the *Edit* menu.

4. Select *Clear* to clear the differences.

   If no errors occur, the system returns to the initial screen once the clearing is finished and the number of quants that were cleared appears.

   If processing errors occurred, the system displays a screen that lists error messages. The system displays a message that specifies how many quants were cleared. Choose *Back* to return to the initial screen.

Storage of Pre-Picked Handling Units

Purpose

You can use this process to put away, pick and transfer non-inventory-managed handling units (HUs) [Ext.] within Warehouse Management (WM). Non-inventory-managed HUs are materials that have already been picked and packed.

For instance, you specify that some of the items of a delivery are to be packed in one packaging material (box). The packaging material and the materials it contains form a handling unit that is assigned to a delivery and can be moved within the warehouse. The content of the handling unit is not significant for Warehouse Management. In fact, the contents can only be determined by referring to the delivery.

Prerequisites

Assign the special stock indicator **Y** to the movement types for putaway (91) and picking (92) in the Implementation Guide (IMG) for Warehouse Management.

To assign special movement indicators to movement types, select *Interfaces → Inventory Management → Define Movement Types [Ext.] → LE-WM Interface Inventory Management*.

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> Note that the delivery for which the handling units were already put away must not be posted goods issue.

Process flow

1. Specify whether you want to put away, pick or transfer handling units.

2. In all three cases, define the selection criteria for the handling units to be stored. The following selection criteria are available:

   – Warehouse number (picks and transfers only)

   – Storage type (picks and transfers only) optional

   – Goods issue date

   – Customer (optional)

   – Delivery (optional)

   – Handling unit (optional)

3. In all three cases, you define standard values for the stock movement. The following standard values are possible:

   – Plant (putaway only)

   – Warehouse number (putaway only)

   – Storage location (putaway only)
   (optional if you have set a standard storage location in the IMG)
   See also: Define Storage Location Control [Ext.]

   – Storage unit type (putaway only) optional

−   Storage type (picks and transfers only) optional

In all three cases, the movement type is determined by the system.

4. If the stock movement is either a putaway or a pick, decide whether it is to be processed in the foreground or the background.

5. Background processing:

a. Putaway

The system lists the handling units to be placed into stock (if errors occur, an error log is created) and also generates the putaway transfer orders.

b. Picking

The system lists the handling units to be picked (if errors occur, an error log is created) and also generates the picking transfer orders.

6. Foreground processing:

a. Putaway

- The system lists the handling units that were selected and generates an error log if errors occur.

- You select the handling units to be put away and specify the destination storage bin manually, if necessary.

- You create the putaway transfer order.

b. Picking

- The system lists the handling units that were selected and generates an error log if errors occur.

- You select the handling units that are to be picked.

- You then create the pick transfer order.

c. Stock transfer

- The system lists the handling units that were selected and generates an error log if errors occur.

- You select the handling units to be transferred and specify the destination storage bin manually, if necessary.

- You then create the transfer order for stock transfer.

7. In all three cases, you confirm the transfer order that has been generated.

a. Putaway

The system posts the handling unit to the destination storage bin, effectively completing the putaway process.

b. Picking

The system removes the handling unit from its storage bin, effectively completing the picking process.

c. Stock transfer

Storage of Pre-Picked Handling Units

The system removes the handling unit from its storage bin and posts it to the destination storage bin, effectively completing the transfer.

You can cancel transfer orders that have not yet been confirmed by using the function.

Putting Away, Picking, and Transferring Pre-Packed HUs

1. In the SAP Menu, select *Logistics → Logistics Execution → Internal Whse Processes → Stock Transfer → Create Transfer Order→ Delivery-Related Handling Units → Non-Stock-Controlled Handling Units*.

2. Depending on your activity, choose one of the following:

   − *→ Put Away Handling Units*

   − *→ Pick Handling Units*

   − *→ Transfer Handling Units*

3. Enter the selection criteria on the initial screen and choose *Program → Execute.*

4. In the *Sel* column, select the handling units and choose *Environment → Generate transfer order.*

   − Stock putaway

     In the *Destination storage bin* column you see the storage bin in which the shipping unit is to be placed. In the *Open transfer order number* column, you see the number of the transfer order that has been generated. In the *HU status* column, the status of the handling unit is set (*Being put away)*.

   − Stock pick

     In the *Open transfer order number* column, you see the number of the transfer order that has been generated. In the *HU status* column, the status of the handling unit is set (*Being picked)*.

   − Stock transfer

     In the *Destination storage bin* column, you see the storage bin to which the handling unit is to be transferred. In the *Open transfer order number* column, you see the number of the transfer order that has been generated. In the *HU status* column, the status of the handling unit is set (*Being transferred)*.

5. Place the cursor on the respective data line and choose *Environment → Confirm in the background.*

   − Once the transfer order is confirmed, it is no longer open, so it disappears from the *Open transfer order number* column.

   − In the *HU status* column, the status of the handling unit is set by the system.

     • During putaway to *put away*

     • During picking to *not in the warehouse*

     • During stock transfer to *put away*

     You can display more detailed information on the storage bin, quant, delivery, transfer order, and HU stock of pre-packed handling units at any time through the menu option *Goto*.

Putting Away, Picking, and Transferring Pre-Packed HUs

Goods Receipt

Purpose

A **goods receipt** is the physical inbound movement of goods or materials into the warehouse. It is a goods movement that is used to post goods received from external vendors or from in-plant production. All goods receipts result in an increase of stock in the warehouse.

The following kinds of goods receipts are considered in the SAP System:

- Goods receipt with reference to a purchase order

- Goods receipt with reference to a production order

- Goods receipt with reference to a delivery

- Other goods receipts (without reference)

The Goods Receipt Process

When goods are received in the warehouse, the processes that take place in the Warehouse Management (WM) system are generally automatic and transparent to the user. From the time a dock worker scans a bar code on the container slip until the goods are placed into a storage slot within the warehouse, WM keeps a record of all the transactions that take place that are associated with each piece of stock. Each of the steps that are concerned – from posting the receipt of the goods in the Inventory Management (IM) component to confirming that the movement has taken place – can be carried out **automatically** by the system. Since they can also be carried out manually if desired, the following description explains each of these steps in detail.

1. To initiate the receipt of goods into WM, you generally post a goods receipt in IM.

2. With the IM posting, the system assigns a quantity of material to a storage bin in an interim storage area for goods receipts and creates a transfer requirement in WM.

   (For more information about interim storage areas, see WM Interface to Inventory Management (IM) [Page 121].)

3. Subsequently a transfer order is created, usually automatically by the system, based on the information in the transfer requirement.

4. Using a predetermined search strategy, the system determines where in the warehouse the goods should be placed and palletizes the goods.

5. The transfer order is used to transfer the goods from the interim storage bin in the receiving zone to one or several storage bins in the warehouse.

6. The warehouse worker confirms that the goods have been transferred. This can be entered manually into the system or automatically by using RF equipment to scan a bar code on a container.
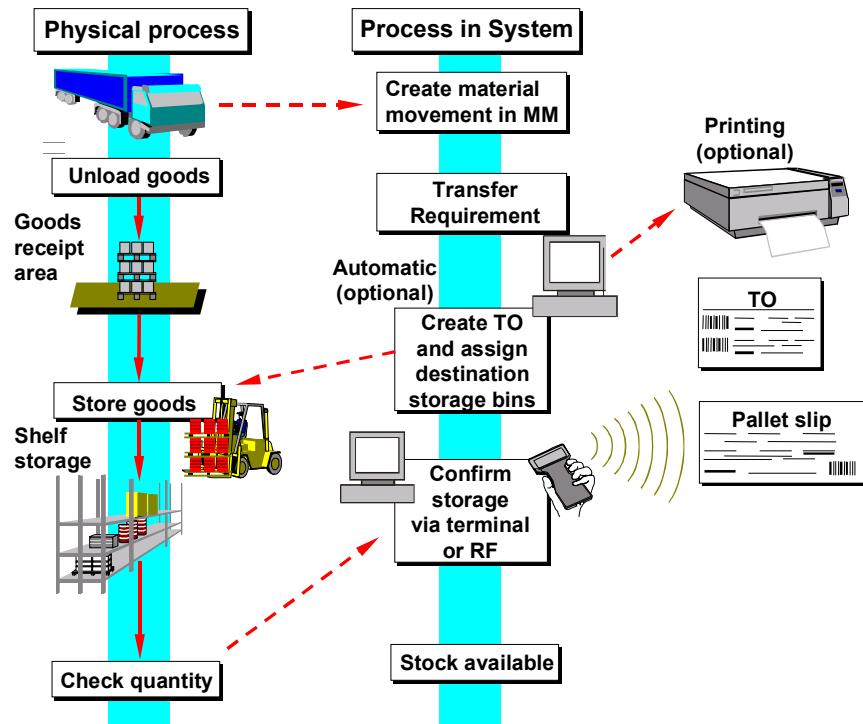
   Any discrepancies between the quantity requested and the quantity transferred into the warehouse are recorded in WM. These differences must be cleared later in the IM component.

   At this point, the goods receipt process is completed.

Goods Receipt

What happens in WM when goods are received in the warehouse?

The following figure shows a possible scenario for an inbound movement (goods receipt) in connection with a transfer order (TO). This example shows what happens in the warehouse and in WM when goods are received.

Creating a Transfer Order without an IM Posting

You can also post goods receipts first in WM by creating a transfer order manually. (No transfer requirement is needed.) IM initially has no information about this goods receipt. Subsequently you record this goods receipt in the IM component.

Creating Transfer Orders Immediately at the IM Posting

Use

You can set up your system so that transfer orders are created immediately in the background when you post material documents in the Inventory Management component.

Prerequisites

You have set up automatic transfer order creation in the system. You have assigned mail message recipients separately for each movement type.
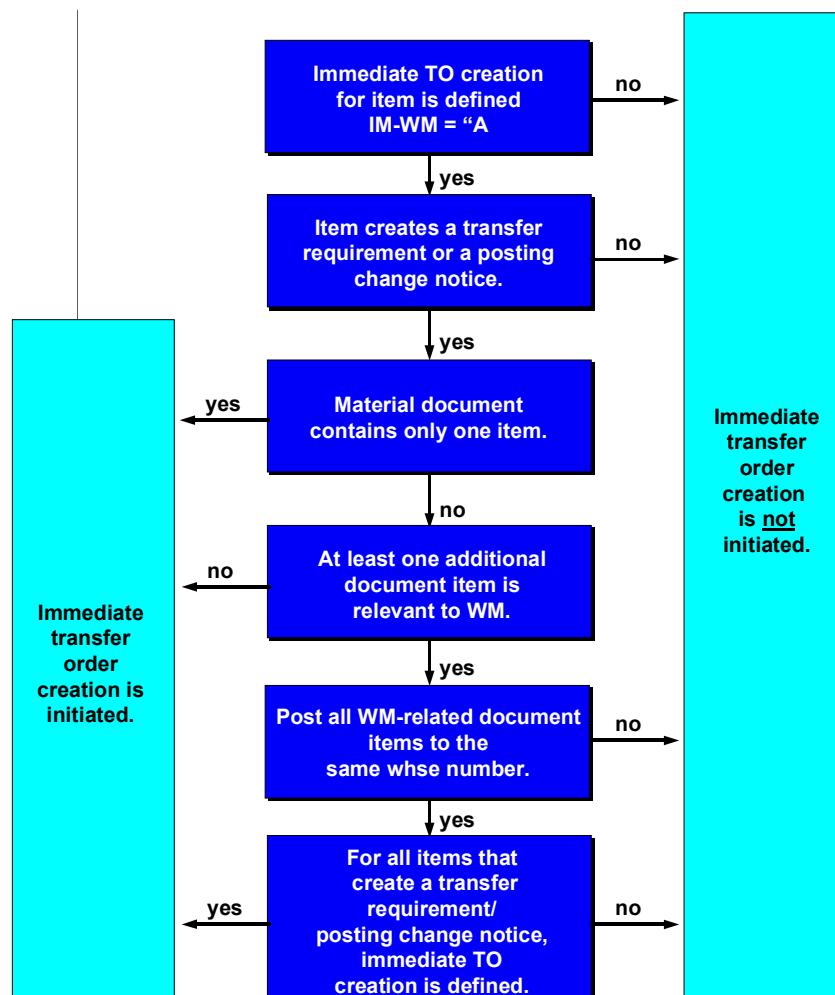
You can define these settings in Customizing for *Warehouse Management* in *Activities* → Transfers [Ext.].

Features

You create material documents in *Inventory Management* (IM) as usual. The Warehouse Management System (WMS) then creates the relevant transfer requirements and posting change notices automatically if this function is included in the relevant WM movement type.

If the following conditions are met, the system immediately creates a transfer order für a material posting in *Inventory Management* (MM-IM)

Creating Transfer Orders Immediately at the IM Posting

```
                                                                    ┌──────────┐
                                                                    │          │
                   ┌──────────────────────┐                        │ Immediate│
                   │  Immediate TO creation│     no                 │ transfer │
                   │  for item is defined  │ ─────────────────────► │  order   │
                   │  IM-WM = "A           │                        │ creation │
                   └──────────────────────┘                        │  is not  │
                            │ yes                                   │ initiated│
                            ▼                                       │          │
                   ┌──────────────────────┐                        │          │
                   │  Item creates a       │     no                 │          │
                   │ transfer requirement  │ ─────────────────────► │          │
                   │  or a posting change  │                        │          │
                   │       notice.         │                        │          │
                   └──────────────────────┘                        │          │
                            │ yes                                   │          │
    ┌──────────┐            ▼                                       │          │
    │          │   ┌──────────────────────┐                        │          │
    │          │yes│  Material document    │                        │          │
    │          │◄──│  contains only one    │                        │          │
    │          │   │        item.          │                        │          │
    │          │   └──────────────────────┘                        │          │
    │          │            │ no                                    │          │
    │          │            ▼                                       │          │
    │          │   ┌──────────────────────┐                        │          │
    │ Immediate│ no│  At least one         │                        │          │
    │ transfer │◄──│  additional document  │                        │          │
    │  order   │   │  item is relevant     │                        │          │
    │ creation │   │        to WM.         │                        │          │
    │    is    │   └──────────────────────┘                        │          │
    │ initiated│            │ yes                                   │          │
    │          │            ▼                                       │          │
    │          │   ┌──────────────────────┐                        │          │
    │          │   │  Post all WM-related  │     no                 │          │
    │          │   │  document items to    │ ─────────────────────► │          │
    │          │   │  the same whse number.│                        │          │
    │          │   └──────────────────────┘                        │          │
    │          │            │ yes                                   │          │
    │          │            ▼                                       │          │
    │          │   ┌──────────────────────┐                        │          │
    │          │   │  For all items that   │                        │          │
    │          │yes│  create a transfer    │     no                 │          │
    │          │◄──│  requirement/posting  │ ─────────────────────► │          │
    │          │   │  change notice,       │                        │          │
    │          │   │  immediate TO creation│                        │          │
    │          │   │  is defined.          │                        │          │
    └──────────┘   └──────────────────────┘                        └──────────┘
```

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> If the system does not create a transfer order automatically even though the indicator for *Automatic TO creation* in the transport requirements header has been activated, you should set up your system so that it sends a mail message to a user in cases like these. The user can then process the error from within the message.

When you post a material document in IM, and movement types both "with" and "without" automatic transfer order creation exist in that document, the system does **not** start the automatic transfer order creation program. Instead, it goes directly to the screen for creating a transfer order for a material document.

Activities

If direct transfer order creation is not possible, you have to create the transfer order for the material document manually.

Manual Creation of Transfer Orders for Putaway

Use

You can also create transfer orders manually if you have a goods movement that only involves internal transfer of goods.

Prerequisites

A transfer requirement, a material document, or an inbound delivery already exists as a basis for the transfer order.

Procedure

1. If you wish to manually create a transfer order for a **transfer requirement**, choose from the SAP menu *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Create Transfer Order → By Transfer Requirement*.

   If you wish to manually create a transfer order for a **material document**, choose from the SAP menu *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Create Transfer Order → By Material Document*.

   If you wish to manually create a transfer order for an **inbound delivery**, choose from the SAP menu *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Create Transfer Order → By Inbound Delivery*.

2. Enter the required data and choose *Continue*.

   You can

   − Enter palletization data to have the goods ready for being set to storage status.

   − Enter the destination bin manually.

   − Add the material to stock in storage bins where there are already quants of the same material. Choose *Add to Existing Stock*.

   If you choose *Putaway background*, the system will create the destination storage bin.

   If you process the transfer requirement in the foreground, you can change the destination storage bin proposed by the system.

   You receive a list of all bins where this material is already stored and where you can add to the existing stock there. Here you can select bins for calculation of the respective additional stock quantity, or you can enter the open quantity to be added to the existing stock.

   If the capacity check is not active for the storage bin, the column *Available capacity* remains empty.

   If you select bins and choose *Max.quantity to be added to stock*, the system adds the open quantity to the Column *Qty to be added* from top to bottom based on the available capacity for the bins.

Manual Creation of Transfer Orders for Putaway

> If the quantity shown in the *Available capacity* column is displayed as a decimal number, you may need to manually adjust the quantity calculated by the system in the *Qty to be added* field. If the open quantity to be added is 200 pieces, for example, and the available capacity is shown as 123,648 pieces, you need to correct the quantity in the *Qty to be added* column to 123 pieces.

Required Function	Procedure
Create transfer order for all transfer requirement items	In the field *Process* enter a **d** (for background processing) and choose *Continue*. The system creates a transfer order for all the items in the transfer requirement in the background and automatically assigns destination storage bins.
Change the selection of processed transfer requirement items	In the field *Process*, enter **h** (for foreground processing) and choose *Continue*. You see the following tabstrips: • *Active work list* Here you see all the items of the transfer requirement if you set the indicator *Activate items* in the initial screen. • *Inactive items* Here you see all the items of the transfer requirement if you do **not** set the indicator *Activate items* in the initial screen. Items in this tabstrip will not be processed for transfer order creation. • *Processed items* You can • Create a storage unit • Add materials to a storage unit • Create transfer order items directly for transfer requirement items in the active worklist You can accept the default quantities in the *Selected quantity* column or change them. To create a transfer order for the selected items, choose *Generate TO Item*. The system creates transfer order items from the active worklist. As soon as the last item has been processed, the system moves all the processed items from the active worklist into the tabstrip *Processed items*.

3. To post the transfer order to the database, choose *Transfer order → Post.*

Posting a Goods Receipt Based on a Purchase Order

This goods receipt is a delivery of goods based on a purchase order. The following procedure explains how the goods are posted with the Inventory Management (IM) component into the Warehouse Management (WM) system.

Tasks in Inventory Management

1. Choose *Logistics → Materials Management → Inventory Management → Goods Movement → Goods Receipt → For Purchase Order → PO Number Known* from the SAP menu.

2. On the initial screen, you must enter at least the appropriate movement type (101) and a purchase order number.

    Choose ENTER.

3. Post the data to the database.

    The system returns to the initial screen and confirms the goods receipt posting. The system automatically generates a transfer requirement and posts the quant(s) to the interim storage area for goods receipts in WM.

    The goods are now in the goods receipt area.

See also:

Transfer Requirements [Page 150]

For complete information about posting a goods receipt in the IM system, refer to the documentation under *Materials Management → Inventory Management*.

Posting Returns for Deliveries

As opposed to normal delivery processing in Warehouse Management, you **do not** create a transfer order for the delivery.

To post a return, you should use the following procedure:

1. Post a goods issue for the return delivery in the SD Shipping component.

    This results in a goods receipt posting in IM and, at the same time, creates a transfer requirement in WM.

2. You then use the transfer requirement to create a transfer order for the stock placement in WM.

Goods Receipt for Inspection

Purpose

Goods that are delivered from an external supplier or from the company's own production department can be posted first into stock that is scheduled for inspection. Goods that are first posted into inspection stock are not available for use.

Prerequisites

The goods receipt for an inspection is identical to a goods receipt based on a purchase order, with one difference. On the IM item overview screen, you must make sure that the inspection indicator for the stock type (the *T* column) is set. When the indicator is set, the quant that is posted to the interim storage area **and** the transfer requirement that is created both have the value **Q** in the *Stock Category* field.

To ensure that the inspection indicator is always set on the item screen, set the inspection indicator

- in the material master record

- when you create a purchase order

Process Flow

Receiving Material into Inspection Stock

1. You process inspection stock initially in the Inventory Management component by creating a goods receipt for a purchase order.

2. In the standard system, with movement type 101 the goods are moved to the interim storage type 902 (GR Area). The goods are assigned to a storage bin that has a dynamic coordinate, which can be the purchase order number or another document number.

3. In addition to posting the stock to the goods receipt area, the system generates a transfer requirement.

4. The system sets the stock category for the quant and the transfer requirement to Q (Quality Inspection).

5. In WM, you use the transfer requirement to create a transfer order to place the goods into the warehouse. For this procedure, see steps 4 through 8 in the section Posting a Goods Receipt Based on a Purchase Order [Page 200].

> Although the material is in the warehouse, it cannot be removed from stock for a goods issue. Because the material has a stock category of Q, it does not belong to the available stock.

For complete information about posting a goods receipt in the IM component, see the *MM Inventory Management* documentation.

See also:

Releasing Material from Inspection Stock [Page 204]

Releasing Material from Inspection Stock

Purpose

After a material in the warehouse has been inspected, it should be released from inspection stock and made available for general use.

There are two different scenarios.

- The material has been moved from the interim storage area for goods receipts into the warehouse, that is, a transfer order has been created to transfer the quant to a storage bin.

  For example, 100 pieces of material L3-001 (a quant) have been moved from the interim storage area for goods receipts to storage bin 01-03-32 in high rack storage. The quant, which can be identified by a goods receipt number, has the stock category of Q.

- Some of the material has been moved from the interim storage area into the warehouse, that is, a transfer order has been created to transfer the quant to a storage bin. The rest of the material stays in the goods receipt interim storage area.

  For example, 50 pieces of material L3-001 (a quant) have been moved from the interim storage area for goods receipt to storage bin 01-03-32 in high rack storage. The remaining 50 pieces stay on the interim storage area. Both quants, which can be identified by a goods receipt number, have the stock category of Q.

Process Flow

For the following example we discuss only the first scenario, that is releasing stock from inspection that is already in the warehouse.

Tasks in IM

Releasing Stock from Inspection in IM [Page 205]

Tasks in WM

Once stock has been released from inspection in Inventory Management, you create a transfer order in WM using a posting change notice as the basis for the transfer order. (For stock in which no QM components are active, it is also possible to release stock from inspection entirely within WM.)

For a description of this process, see Processing Inspection Stock [Page 333].

Releasing Stock in IM from Inspection

To release stock from inspection that is already in the warehouse

1. In the SAP menu, select *Logistics → Materials Management → Inventory Management → Goods Movement → Transfer Posting*.

2. On the initial screen, you need to enter the movement type and a plant.

   For the movement type, choose *Movement type → Transfer posting → Stock to stock → QI to unrestricted*.

   Select ENTER.

   The system displays the screen on which you enter the material number, quantity, and the IM storage location of the material that you want to release from inspection.

   If the release should be carried out for a specific goods receipt, the system displays a window in which you can enter a goods receipt number after you choose ENTER.

   Quants from various goods receipts can be differentiated from one another by a goods receipt number, which is stored in the quant.

3. To save the transfer posting to the database, choose *Transfer posting → Post*.

What Happens in the System?

When you post the release of the material in IM, the system takes the following actions:

- A posting change notice is created in WM.

- Two quantities are posted to the interim storage area for posting changes:

    - a negative quant with a stock category of Q

    - a positive quant with a blank stock category

See also:
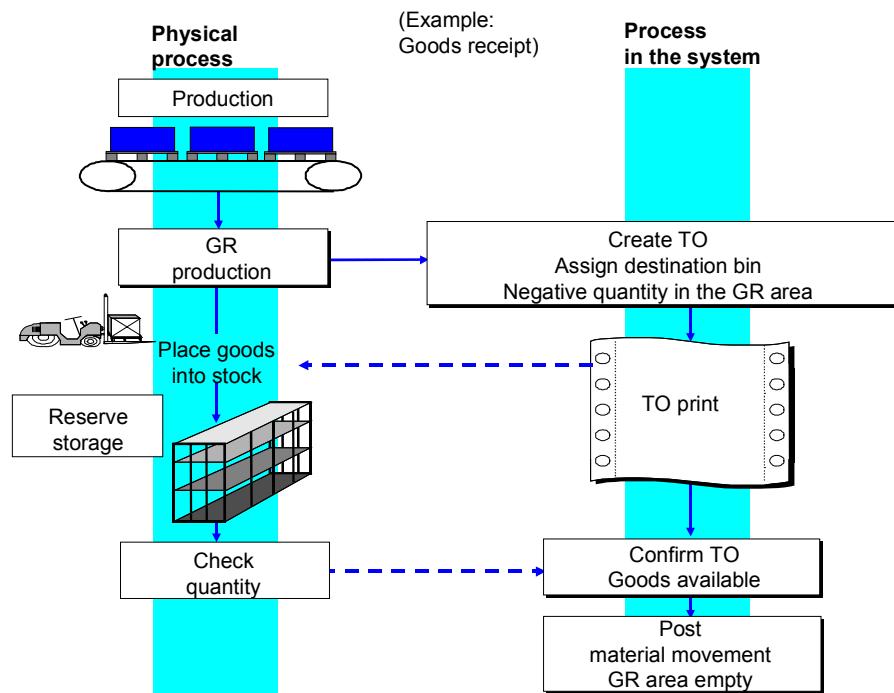
Releasing Stock from Inspection [Page 335]

Goods Receipt Without a Previous Posting in IM

For this type of goods receipt, you put goods away by first creating a transfer order in the Warehouse Management (WM) component. This means that the goods are not posted initially in the Inventory Management (IM) component and a transfer requirement is not created.

When goods are first placed into stock using the WM component, the quantity of material is not yet available in the IM component. The material becomes available only when the goods receipt posting is carried out in IM. For the subsequent goods receipt posting in IM, the system does not generate a transfer requirement since the material has already been put away in the warehouse with a transfer order. This process is illustrated in the graphic below.

These postings result in a negative quantity in the interim storage type for goods receipt. Therefore you must ensure that negative quantities are allowed for this interim storage type. To do this, select the field *Allow negative stock* in the storage type record. (See *Define storage type* in the *Master data* section of the *Warehouse Management IMG*.) (See also Negative Stock Check [Page 211].)

Creating a Transfer Order in WM without a Previous Posting in IM [Page 209]

The Role of the Movement Type

Normally all movement types for goods receipts have an indicator that triggers the creation of a transfer requirement when a goods receipt is posted in IM. For goods receipts that are posted first in WM, no transfer requirement is needed, nor should one be created in this case. You have to change the way the system handles the IM-WM interface so that a transfer requirement is not created.

Change the Movement Type

If most of the goods movements processed with movement type 521 are posted first in WM, then you should change this movement type. In the table for the WM reference movement type, the *TR* column (for the automatic creation of a transfer requirement) must be blank.

Use a Special Movement Indicator

For those few instances when you need a transfer requirement, you can use a special movement indicator. To do this, create a new movement type in the table for the WM reference movement type by copying the entry for movement type 521. For the new movement type assign a special movement indicator and set the indicator for the automatic creation of a transfer requirement (the *TR* indicator). Do not change any of the other fields.

Dynamically Modify the Special Movement Indicator

For postings in IM that have not yet taken place in WM, you can dynamically modify the WM parameters. When you choose *WM Parameters* on the initial screen of the IM goods receipt posting task, the system displays a window in which you enter the special movement indicator. This indicator is valid only for the current single task.

See also:

Movement Special Indicators [Page 147]

Automatic Posting in IM

If the majority of the goods receipts postings that use movement type 521 are posted first in WM, this could result in a large number of postings that have to be made at a later time in Inventory Management. It may be useful to partially automate these subsequent postings by using a batch report that clears the negative stock postings from the interim storage area. You could easily develop such a report for your own system by using report RLLI2100 as a basis. (RLLI2100 clears inventory differences from WM and posts them in IM.) With this report, you eliminate the need to execute individual manual postings to IM.

Sample ABAP for Executing Postings Subsequently in WM [Page 208]

Example: Sample ABAP to Follow-up Postings in IM

Report RLEXIP01 serves as an example as to how information that has been posted in WM can be completed in IM. Since it is intended to be used for customer-specific development, this report was intentionally kept easy to read and is well documented online. For this reason it is restricted to movement type 501 (Goods receipts without purchase orders into unrestricted stock).

To run this sample ABAP

1. Run the report **RLEXIP01**.

2. On the initial screen, specify the warehouse number, storage type (902 in the standard system) and the storage bin (for example, GR-AREA) depending upon the language.

3. To retrieve a list of goods receipts postings, choose *Program → Execute*.

    The system retrieves a list of the existing negative quants that were posted in IM. From the list you can select the quants that are to be cleared.

When clearing the quants, the transaction for processing goods movements is called up with a list of the selected materials and the appropriate postings can be carried out.

Creating a TO in WM without a Previous Posting in IM

This process is explained using the transfer of a pallet from production into the warehouse as an example. The goods are brought to the identification area of the high rack storage warehouse with a conveyor belt and should be placed into stock.

1. To create the transfer order, choose *TransOrder* → *Create* → *Without reference* from the WM menu bar.

2. On the initial screen, enter the warehouse number, WM movement type (521), quantity, material number, and plant. If you enter a storage unit type (in the *Stor.unit type* field), the system uses the unit type you enter instead of the storage unit type in the material master record, if available.

    If you have a single storage unit type, choose *Goto* → *Single item* to go to the item generation screen. If you are creating a transfer order for more than one storage unit type, choose ENTER or *Goto* → *Preparation* to go to the preparation screen where the storage unit types and quantities are proposed.

3. If you selected the item generation screen (for a single storage unit type), the system proposes the destination storage bin and type, as well as the quantity of material that will be placed in the storage bin. The proposed values are based on the storage unit type and stock placement strategy for the storage type, among other things. To create a transfer order that consists of only one item choose ENTER. The system returns to the initial screen with a message that the transfer order was created.

    If you are creating a transfer order for moving more than one storage unit type into the warehouse, you go to the preparation screen. The system proposes the palletization information, if available, from the material master record. You can accept the proposed values or overtype them. Choose either *Goto* → *Generate TO item* → *Foreground process* or *Goto* → *Generate TO item* → *Background process* to create the transfer order items, which are displayed on the preparation screen.

    To save the transfer order, choose *Transfer order* → *Post*. The system returns to the initial screen with a message that the transfer order was created.

With this transfer order the system posts the quantity in WM. A negative quantity is posted to the goods receipt interim storage area while a positive quantity is posted to the destination storage area. These individual quantities zero each other out and leaves the WM total stock balance at zero.

Displaying the Stock Balance

There are several ways to display the stock balance. For example, you can choose *Master data* → *Material* → *Stock* → *Stock overview* from the WM menu bar. This task displays the summarized stock balances by storage type for a specific material.

Posting the Goods Receipt in IM

You complete this type of goods receipt by posting it in IM.

1. Choose *Goods movement* → *Goods receipt* → *Other* from the IM menu bar.

2. On the initial screen, enter at least the movement type 521 and the plant.

Creating a TO in WM without a Previous Posting in IM

With this task the stock in IM is increased. Additionally a positive quantity is posted to the goods receipt interim storage area in WM. This means that the negative quantity in the interim storage area is removed, resulting in a positive quantity in the storage bin.

Negative Stock Check

For IM postings, it is possible to prevent stock in a storage type from becoming negative. To do this, in the appropriate storage type records you must leave the field *Allow negative stock* blank (deselected). If this field is not selected, you can prevent negative quants from existing in the storage type depending on the settings in table 160M.

Setting Error or Warning Messages for Negative Stock Check

In table 160M, you can control whether the system issues an error message, a warning message, or no message at all when negative stock is posted. You can influence the type of message by using the parameter MSV in the user master record.

You create the key for Table 160M as follows:

- *Version*   = Parameter ID MSV from the user master

- *Applicat*.*area*   = L9

- *Message*   = 040

- *Category*   = E, W or blank

  The field *Cat* in Table 160M the system controls whether an error message, a warning message, or no message at all is to be issued.

If the parameter ID MSV in the user master is not maintained, the system   accesses the table using version 00.

Stock Placement Using Storage Unit Types

The Warehouse Management (WM) system allows you to use a number of different storage unit types when you transfer and store materials in the warehouse. For example, you can transfer materials on pallets of various sizes, such as European pallets or industrial pallets. Crates or pallets of materials that must be stored in different locations because of height or weight limits can be stored without unnecessary loss of space.

How are Storage Unit Types Used?

In order to use storage unit types you can

- Define storage unit types in the material master record

- Enter a storage unit type on the initial screen to create a transfer order without an originating document

- Enter a storage unit type on the preparation screen for a transfer order

When creating transfer orders, if you enter the storage unit type on either the initial screen or the preparation screen, the system uses the value you enter instead of the storage unit type in the material master record, if one is available. If you do not enter a storage type on the initial screen and you go to the preparation screen, the system uses the storage unit type defined in the material master record. If you do not enter a storage type on the initial screen and you go to the item screen, the system does not propose a storage unit type, even if one has been defined in the material master. You must enter the storage unit type and then choose ENTER before the system will propose a storage type and bin.

Example: Using Storage Unit Types [Page 213]

Entering Palletization Data When Posting Goods Receipts

You can enter palletization data in IM when posting goods receipts. Depending upon the movement type, a dialog box appears for each line item. The system proposes palletization data from the material master record in this box. You can change the data in the dialog box if necessary. The palletization data is transferred to the transfer requirements and is, subsequently, taken into account when transfer orders are generated. We recommend that you use this new functionality, particularly in conjunction with automatic transfer order creation.

You activate this function for each movement type using the Customizing application. See the section on setting up automatic transfer order creation under *Activities → Transfers* in the *Warehouse Management IMG* documentation.

This function is only useful when activated for goods receipt postings in which transfer requirements are created.

Example: Using Storage Unit Types

For the following example, which demonstrates palletization for a putaway, the situation is as follows: Material O2 can be delivered on European pallets (storage unit type EP) or on industrial pallets (storage unit type IP). Each industrial pallet holds 40 canisters; a European pallet holds 20 canisters. This information has been entered in the material master record for the material.

You receive a delivery of 200 canisters of the material O2. After the goods receipt has been posted in IM and a transfer requirement has been created, you want to transfer the material from the goods receipt interim storage area into the warehouse.

1. Use one of the tasks to display transfer requirements (for example, display transfer requirements for the specific material).

2. From the list of transfer requirements that are displayed, select the transfer requirement from which you want to create a transfer order.

3. In the palletization section of the preparation screen for the transfer order the system automatically proposes 5 industrial pallets each containing 40 canisters, based on the storage unit type defined in the material master record, as shown below:

Palletization

SU		Qty per Storage Unit	SUT	Type	Sec
5	X	40.000	I P		
	X	20.000			

4. If you choose to continue the process in the foreground, you go to the item screen where the system proposes storage bins that are in storage area 004 (bulk storage).

   When the system has assigned the 5 pallets to storage bins, it returns to the preparation screen. From this screen you choose *Transfer order* → *Post* to post the transfer order to the database.

Cross-Docking

Reserve storage areas are generally used to supply materials for goods issue. When you bypass the warehouse, the material is not removed from a reserve storage area. Instead, the material for a goods issue is taken directly from the goods receipt interim storage area. In this way you avoid transferring material from the goods receipt area into the warehouse and then from the warehouse to the goods issue interim storage area. As a result, the material reaches the goods issue area sooner.

Within WM, pre-allocated stock is typically material that is required for goods issue, for example backordered stock, material needed in production or material requested by a customer, which is not in the warehouse. When you create a transfer order to place material into stock, the system checks to see if the material is designated as "pre-allocated". If so, the system displays a message identifying the goods as pre-allocated stock.

See also:

Stock Placement with Active Bypass

The system activates the active bypass, when it identifies a "pre-allocated" material in a stock placement transfer order. The material is not placed in reserve storage but is routed directly from the goods receipt interim storage area to the destination that you have specified in the stock-out table.

1. When you create the transfer order for stock placement, the system looks at the movement type record to determine if it should check the material for pre-allocated stock.

2. If the pre-allocated stock indicator is set for the movement type, the system then checks the stock-out table. Data about stock that has already been allocated to fill an order is stored in this table.

3. If the material is listed in the stock-out table, the system activates the active bypass and displays a message on the *Transfer Order Preparation* screen to inform you that the material is pre-allocated stock.

Procedure

1. From the preparation screen for creating a transfer order choose *Pre-allocated stock.*

   The system displays the information in the stock-out table for the material. The pushbuttons on this screen allow you to select, deselect and delete entries and adopt open quantities that are to be processed.

2. On the pre-allocated stock screen you can enter a quantity in the *Selected qty* field or mark a line and choose the *Calculate selected quantity* icon.

   If you select the *Calculate* icon, the system copies the open quantity in the stock-out table into the *Selected qty* field. However, if the quantity needed for the TO is **less than** the quantity in the stock-out table, the system enters the smaller quantity into the *Selected qty* field and reduces the stock-out table quantity accordingly when you post the data to the database.

3. To create the transfer order item, choose either *Edit* → *For stock placement* → *Foreground*   or *Edit* → *For stock placement* → *Background*.

4. Once you have finished creating the transfer order items, save the transfer order to the database.

   If the quantity is equal to or more than the quantity entered in the stock-out table, the system removes the entry from the table when you confirm the transfer order.

Setting up Active Bypass for Putaway

For the relevant movement types for goods receipt, you set the pre-allocated stock indicator. If a material is needed for production or for a customer order but it is not in stock in the warehouse, you enter it into the stock-out table.

To set up the relevant movement type for active bypass

1. Choose *Logistics Execution* → *Warehouse Management* → *Activities* → *Transfers* → *Define movement types* in *Customizing* for *Warehouse Management.*

2. After you select the movement type, select *Consider Pre-alloc.* (in the *Control* area of the screen).

To enter material into the stock-out table:

3. Choose *Logistics* → *Logistics Execution* → *Outbound Process* → *Goods Issue for Other Transactions* → *Picking* → *Maintain Missing Stock.* from the SAP menu.

   The system displays a list of entries in the stock-out table.

4. To enter new pre-allocated stock, choose *Edit* → *New entries*.

   The system displays a screen on which you enter information about the pre-allocated stock. On this screen you must enter the warehouse number, material, plant, storage location, current number, storage type and storage bin where the material is needed, and the required quantity. The system uses the current number to differentiate entries for the same material. You can enter any number for the current number.

Adding Goods to Existing Stock

When addition to existing stock has been defined for a storage type, the system places goods in storage bins that already contain the same material. When you create the transfer order for putaway, the system looks at the storage type record to determine if the strategy or the indicator allows additional stock.

1. If additions to existing stock are allowed, choose *Goto* → *Add to existing stock* from the transfer order preparation screen to display the information about the storage bins in which the material is already being stored. This screen shows the storage type and bin, total stock in the storage bin and the remaining bin capacity.

2. On the addition to existing stock screen you can select the storage bin or bins in which you want to place the stock by selecting the *S* column.

   To create the transfer order item, choose either *Edit* → *Putaway* → *Foreground* or *Edit* → *Putaway* → *Background*.

   If the strategy for the storage type is set for additional stock, the system automatically selects the appropriate storage bin.

3. Once you have completed creating the transfer order item, choose *Transfer order* → *Post* from the preparation screen to save the transfer order to the database.

Goods Issue

Purpose

A goods issue is defined in WM as a physical **outbound** movement of goods or materials from the warehouse.

A goods issue is a **goods movement** that is used to post the internal use of material, the issuing of material and the shipment of goods to a customer. A goods issue results in a decrease of stock in the warehouse.

- Issues to a cost center or project

- Material staging for production

- Delivery of goods to customers

Integration

As shown in the following table, various application components in the SAP System initiate the transfer of goods from the Warehouse Management system (WMS) by producing a document on which the goods movement is based. These systems also carry out the necessary checks to determine if the material is available in the warehouse.

Overview of Goods Issue

SAP Application Component	Relevant WM Document
Inventory Management (IM)	Transfer requirement
Production Planning (PP-SFC)	Transfer requirement
Shipping (LE-SHP)	Delivery

Features

Goods issues in WMS can be based on

- Deliveries

    In this case, you pick goods for deliveries that are created in Shipping.

- IM Postings

    When you post a goods issue in IM, the system generates transfer requirements that are used as a basis for creating transfer orders.

- Two-step Picking

    For 2-step picking, the picking process is divided into 2 separate steps. In the first step, you pick the entire quantity of materials need to fill requests (for example, several deliveries or transfer requirements). During the second step, you divide up the materials and allocate them to match the corresponding requirements.

Automatic Processing

Depending upon entries in the material master record and the way you configure the movement types and picking strategies in the WM system, you can streamline and optimize picking in your warehouse. In conjunction with the configuration of other SAP application components that are interfaced to WMS, there are several options that can initiate automatic processing for goods issues in WMS.

The Shipping (LE-SHP) system, for example, can initiate the picking of goods in WMS when a delivery is created. In randomly organized warehouses, the system creates one or more transfer order items for each delivery item. Information about the picking process and its status are automatically transferred into the delivery to provide up-to-date information. The picked quantities are then reflected in the delivery items in Shipping when the transfer order is confirmed in WMS.

See also:

Goods Issues Based Upon a Delivery

Usage

You use the Sales and Distribution (SD) component of the SAP System to process all sales activities with customers and plants. In SD Shipping you create a delivery based on sales orders or scheduling agreements. The delivery is the basis for shipping and is generally used to start picking operations.

Features

In general,

- The delivery takes on the role of the transfer requirement.

- The system generally creates one transfer order for each delivery. If the transfer order split function is active, the system may also create several transfer orders for one delivery.

- At the item level at the storage location, the system recognizes that items are relevant for Warehouse Management (WM).

Using SD without WM

If you are using SD without WM, you generally use information from the picking lists to retrieve material from the warehouse. Information about the storage location from the material master can be printed on the picking list. However, not all the required information is provided by the picking list, since material in randomly organized warehouses can be stored in many different storage bins.
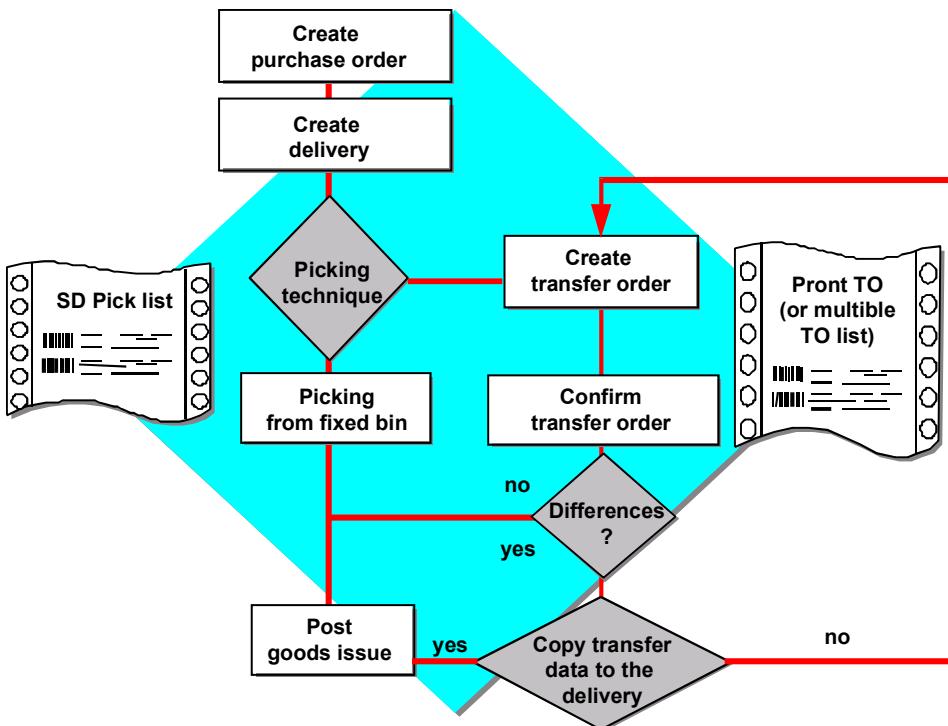
For complete information about using SD without WM, see the *SD Shipping* documentation.

When you use SD and WM, the following techniques are available in WM:

- Random Picking Using Transfer Orders [Page 222]

- Picking from a Fixed Bin without a Transfer Order [Page 226]

- Picking Quantities Based on Size [Page 227]

The following graphic shows how picking is carried out in conjunction with the SD application:

Depending upon the picking technique, materials are picked from the fixed bin (with a picking list from SD) or a transfer order for a delivery is created.

If picking takes place with a transfer order, the WM status in the delivery is set to "A" (relevant for Warehouse Management). The WM status is updated after each step during transfer order processing.

If picking takes place without a transfer order, the WM status in the delivery is set to "N" (not relevant for Warehouse Management).

Random Picking Using Transfer Orders

Implementation Options

You use this picking technique when the picking is carried out from a randomly organized warehouse using transfer orders.

This technique has the following characteristics:

- The document used to remove the material from the warehouse is a transfer order (TO), which is created in the WMS.

- When material is transferred from the warehouse, it can be transferred from reserve storage as well as a picking area.

- The source storage bins for the material are determined by the stock removal strategy defined for the corresponding storage type.
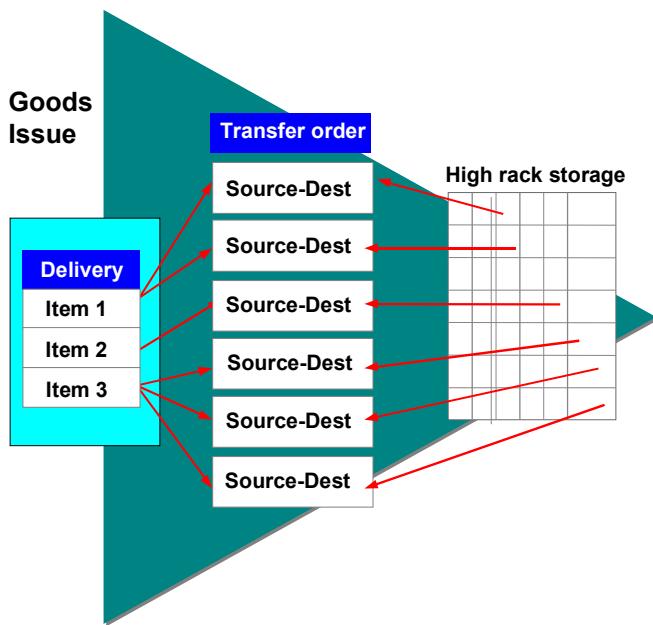
You can use this picking technique if you require verification of the picked materials. Unlike the situation with fixed bin picking, the printed transfer order serves as a pick list for picking the materials required. The confirmation of the physical goods removal depends upon the confirmation of the transfer order. If you confirm the transfer order, the picked quantity is deducted from the storage bin and posted to the stock quantity in the interim storage type.

The stock pick can take place from various storage types (for example, from the main storage area for replenishment stock **and** from the fixed-bin storage area). The WMS selects the storage types and individual storage bins from which to pick the stock in accordance with the pick strategies defined for these.

Procedure

The delivery is a request to WM to make goods available. You create a TO based on the delivery. The transfer order is then used as a pick list.

The figure below shows the relationship between the delivery document, the WM transfer order, and the storage bins in the high rack storage area from which the material is removed. During TO generation, the system creates a transfer order with different material numbers in which two TO items are needed for the material from item 1 of the delivery, one TO item is needed for the material from the second delivery item, and three TO items are needed for the material from the third delivery item.

When can you use this picking technique?

You use this picking technique when you need a return verification of the materials picked. In contrast to fixed bin picking, the printed transfer order serves as the picking list for the removal of material from storage. The verification of the physical stock removal is based on the confirmation of the transfer order. When you confirm the transfer order, the system subtracts the quantity picked from the storage bin and posts it to the stock quantity in the interim storage area. The stock removal can take place from several different storage types in the warehouse (for example, reserve storage **and** fixed bin storage). WM selects the storage types and individual storage bins from which the stock is to be picked based on the stock removal strategies you define for this purpose.

Posting a Goods Issue for a Delivery

See also:

Posting Changes in WM

Pick-and-Pack During Picking

Use

You can generate pick HUs into which materials are packed during picking. The pick HU is assigned to a transfer order in WM. All the pick HUs are then copied into the delivery and further packing is normally no longer necessary in the delivery.

If you are using Handling Unit Management [Ext.], you will normally use handling units [Ext.] during picking from storage locations managed for handling units. Here, the complete HU can be picked or the stock can be repacked onto a pick HU. If you still wish to use pick HUs for picking, even though you do not have storage locations with HU management, you can set this function in the Implementation Guide (IMG).

As of Release 4.0, you have the possibility to determine a packing proposal in the transfer order using a customer exit, and you can then confirm the handling units that were created to the delivery. If you wish to continue to use this functionality, you need to make the appropriate changes in the Implementation Guide (IMG).

Prerequisites

If you wish to determine a packing proposal in the transfer order using a customer exit, you must configure the following setting in Customizing for *Handling Unit Management*:

- Create an entry for the warehouse number being used, enter *** for the source destination type and the destination storage type, and set the indicator `User-Exit`. You do not need to make any specifications for the movement type, the packaging material, and automatic creation of a pick HU. Use the workstep Control for Automatic Pick-HU Creation [Ext.].

If you wish to use the pick-and-pack functions for a storage location without HU management, you must configure the following setting in Customizing for *Warehouse Management*.

- Set the indicator `pick/pack` for the respective warehouse number in which you wish to work with pick HUs. Use the workstep *Interfaces* → *Shipping* → Define Shipping Control [Ext.] → *Shipping Control per Warehouse Number*.

If you are working with Handling Unit Management, you do not need to set the indicator for pick/pack. If you wish to automatically create pick HUs during TO creation, you must configure the following setting in Customizing for *Handling Unit Management*:

Create an entry for any combination of warehouse number, source storage type, destination storage type, and movement type, enter a packaging material, and set the indicator for `Automatic Creation of a Pick HU`. Use the workstep Control for Automatic Pick-HU Creation [Ext.].

Features

In the Implementation Guide (IMG), you can set for the creation of pick HUs which packaging material [Ext.] the system should propose for picking. You can set the following packing proposals for any combination of warehouse number, source storage type, destination storage type, and movement type:

- Automatic creation of pick HUs for creation of a transfer order

   The system automatically creates a pick HU with the specified packaging material during creation of a transfer order and assigns the pick HU to this transfer order.

- Automatic determination of packaging materials during creation of a transfer order

  The system does not create any pick HUs, but uses the specified packaging material as information and copies this, for example to an IDoc, for the creation of a transfer order. If this IDoc is sent to another system, the receiving system can create a pick HU using this proposal. This ensures for the verification that the picked materials can also be packed into this handling unit.

- Manual creation of pick HUs and assignment to a transfer order

  The system does not create any pick HUs, nor does it determine a packaging material. You can create the pick HUs manually and assign these then to a transfer order.

  You wish to define that in a certain storage type (for example, fixed bin warehouse) Europallets will always be used for picking. In Customizing, you then set automatic creation of pick HUs and the use of the packaging material Europallet for this storage type. In another storage type, for example, the packaging changes frequently, and you decide there that the pick HU is to be created manually.

TO Item Split for Pick HUs

If you determine during picking of the TO items that the pick HU is too small for the entire item quantity, you can split the TO item and execute picking for the newly created pick HU.

Picking from a Fixed Bin without a Transfer Order

You use this picking technique when you want to pick the quantities directly from fixed storage bins without using a transfer order.

This technique has the following characteristics:

- The document used to remove the material from the warehouse is a picking list, which is created in the Sales and Delivery (SD) Shipping component.

- The source storage bins for the material are determined by the picking area storage type and storage bin defined in the material master record.

To use this technique, you need to create a fixed storage bin in the picking area (fixed bin storage type) for each material that is to be picked. You assign the fixed storage bin to the material in the material master record field *Storage bin*.

When you create the delivery document in SD, the information about the location of the material is provided by WM. This information, which includes the warehouse number, the storage type, and the fixed storage bin for the material, is stored in the delivery item.

When can you use this picking technique?

You can only use this picking technique if you have assigned a fixed storage bin to all materials that are to be picked. You assign this bin in the WM view of the material master record. When you use this picking technique, the material is picked directly from the fixed bin that has been assigned in the material master. For fixed bin picking, WM does not create a transfer order. Therefore, a verification of the pick is not possible when you use this picking technique. The fixed storage bin is also the interim storage bin, that is to say, when you post the goods issue in the SD application component, the quantity picked is cleared directly from the material stock of the fixed bin. The removal of the materials takes place using the picking list that was created in SD.

You should only use this picking technique if you are willing to do without a return verification of the pick.

When you post the goods issue in SD, the fixed storage bin is used simultaneously as an interface between IM and WM.

Picking Quantities Based on Size

This picking technique is a combination of the fixed bin picking technique [Page 226] and the random picking technique [Page 222]. Depending on the quantity of material that is to be picked for each item in the delivery, the system determines which of the two techniques will be used for picking. As the criteria for this quantity check, the system uses the control quantity defined in the *Control quantity* field in the WM view of the material master record for each material that is to be picked. If the quantity to be picked is larger than the control quantity, the system uses the **random picking** technique. If the quantity to be picked is the same or less than the control quantity, the system uses the **fixed bin picking** technique to pick the required materials.

When should you use this picking technique?

You use this picking procedure when both techniques are necessary within a warehouse, that is, picking from a fixed bin location and random picking. For this procedure, you remove material from the reserve storage area or from fixed storage bins in the picking area.

The following applies to this picking technique:

- Two documents can be used to remove the material from the warehouse: a picking list for small quantities, which is created in SD or a transfer order for large quantities, which is created in WM.

- When small amounts of material are transferred from the picking area, the material is transferred directly out of the warehouse. However, when large quantities are removed from reserve storage, the material goes first to an interim storage area for goods issues.

- The source storage bin for small quantities of a material are determined by the storage bin defined in the material master record.

- For all materials that are to be picked, you need to create a fixed storage bin in the picking area (picking storage type). You must enter the fixed storage bin to the material in the material master record (*Storage bin* field). In addition, you need to enter a maximum transfer quantity in the *Control quantity* field for the material master record (at the warehouse-storage type level).

- For each delivery item the system checks the quantity being picked against this quantity to determine if the picked quantity is "large" or "small". If the quantity of the item is small (less than or equal to the quantity in the *Control quantity* field), then it is picked from the fixed bin location. Otherwise the quantity is randomly picked from another storage type using a transfer order and then transferred to the interim storage area for goods issues.

Goods Issue for a Delivery

The following describes picking using transfer orders. For this process description, the sales order already exists and the delivery based on the sales order must be processed. The following steps must be carried out for the goods issue:

1. Creating Deliveries [Page 229]

2. Creating a Transfer Order [Page 230]

3. Confirm Transfer Orders [Page 232]

See also:

Automatic/Immediate Transfer Order Creation [Page 161]

Processing Differences for a Delivery [Page 233]

Partial Picking [Page 234]

Transfer Order Split [Page 179]

Creating a Delivery

In SD, you now create a delivery based on a sales order.

1. Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Outbound Delivery → Create → Single Document → With Reference to Sales Order* from the SAP menu.

2. You must enter the order number and shipping point on the initial screen.

3. To post the delivery to the database, choose *Outbound Delivery → Save*.

What Has Happened in the System?

After the delivery has been saved, the following data has been set in the delivery document:

- The SD picking status is set to A, which means that the material must be picked.

- The WM activity status is set to A, which means that a transfer order is required for further processing.
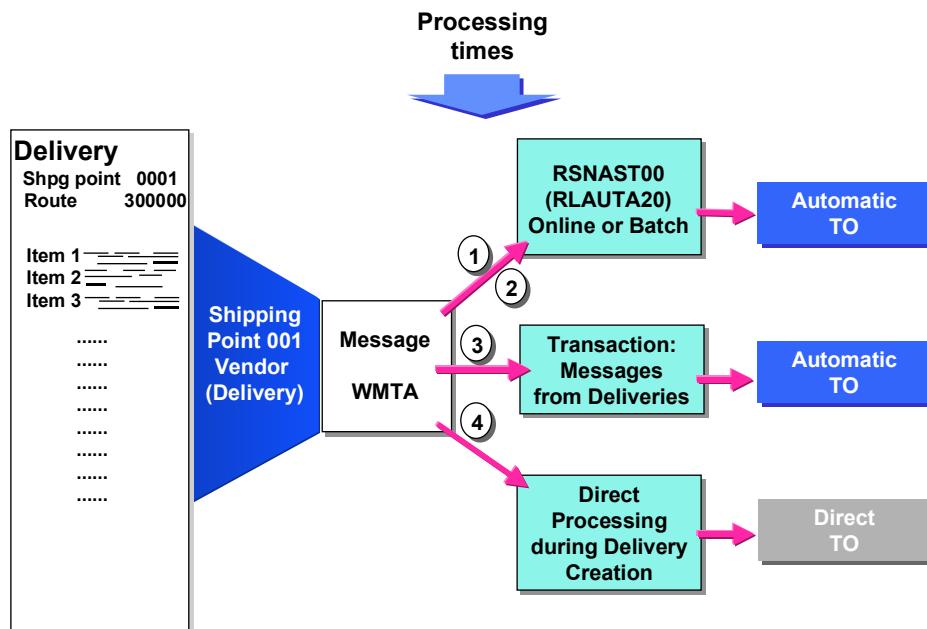
Automatic Creation of Transfer Orders for Outbound Delivery

Use

You can create transfer orders on the basis of outbound deliveries either automatically or directly from the system.

Features

To create transfer orders directly or automatically for outbound deliveries, you trigger the message type **WMTA** using the SD message control. Only WM-relevant delivery items are processed. Different forms of processing result, depending on the processing time of the message type **WMTA**:

- Processing time **1**, **2** and **3** (processing later)

  In this case, the message is processed either via a program in the background (processing times 1 and 2) or manually via the transaction *Messages for delivery* (processing time 3).

  If the *automatic TO creation* indicator is set for the reference documents and a report is carried out regularly, this is known as **automatic transfer order creation.**

- Processing time 4 (processing immediately)

  Here message processing is initiated immediately after the delivery has been created. Therefore, we call this **immediate transfer order creation**.

If you want the system to generate transfer orders in the background without any additional activity necessary by the user, we recommend that you use processing times **1** or **2**. You can then plan to periodically execute the report RSNAST00 (Selection Program for Issuing Output) with a corresponding repetition time for the message type WMTA.

> During creation of transfer orders we recommend that you process later, in order to improve performance for processing time 4. If you choose an appropriately small repetition time period when you set up the system to use report RSNAST00, the time required to create transfer orders is nearly the same as when using time period "4" for immediate transfer order generation.

For further information on how you set up message determination for deliveries see the implementation guide (IMG) for *Shipping* under *Basics → Message Control → Message Determination → Maintaining Message Determination for Output Deliveries →* Maintaining Condition Tables [Ext.].

> For the creation of "batch-neutral" delivery items, via the WM transfer order, the system searches for specific batches in WM and updates the delivery.
>
> If you create transfer orders for "batch-neutral" deliveries in the background, depending on the batch determination strategy, the system automatically selects the oldest batches in the warehouse first. If you prefer to do so, it is still possible to select specific batches in WM when you create transfer orders in the foreground.
>
> If you create a transfer order for outbound deliveries for materials subject to valuation and materials to be handled in batches, a valuation type that is predefined in the outbound delivery can only be taken into consideration if you use *General batch determination*.
>
> For more information, see Batch Determination [Ext.].

Confirming a Transfer Order for a Delivery

After the goods have been picked from the warehouse, you confirm the transfer order in WM. When you remove stock from the warehouse you typically confirm the entire transfer order at one time.

To perform this task, choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Confirm Transfer Order → Single Document → In One Step* from the SAP menu. You can also access the confirmation task from the display tasks for transfer orders.

See also:

Transfer Order Confirmation [Page 173]

What Has Happened in the System?

After the transfer order has been confirmed, the following data has been set in the delivery document:

- The SD picking status is still C, which means that the material has been picked.

- The WM activity status is set to C, which means that the transfer order has been confirmed.

See also:

Processing Differences for a Delivery [Page 233]

Processing Differences for a Delivery

During the confirmation of a transfer order, a difference between the required quantity and the available quantity can occur.

For example, a transfer order for a delivery states that 50 pieces of LLD-300 are to be picked from storage bin 02-03-44. However, the warehouse worker finds only 45 pieces in the storage bin and confirms the transfer order with a difference of 5 pieces.

What Has Happened in the System?

After the difference in the transfer order item has been confirmed, the following data has been set in the delivery document:

- The system updates the quantity to be picked.

- The SD picking status is B, which means that the item has been partially picked.

- The WM activity status is set to C, which means that the transfer order has been confirmed.

Now the decision has to be made whether another picking is to be carried out for the missing quantity or whether the customer receives a partial delivery.

Another Picking

If the remaining open quantity of 5 pieces in the above example is to be picked, you can create a second transfer order from the delivery document. In this case you process the transfer order as described above in "Creating a Transfer Order." You confirm the new transfer order for 5 pieces after they are picked. In this case the system sets the SD picking status in the delivery document to C after the remaining quantity of 5 pieces from the second transfer order has been picked and confirmed.

Afterwards, you can post the goods issue.

Partial Picking

Partial picking can occur in the following situation. When you create the sales order or delivery, the system determines that the goods are available in the warehouse to fill the delivery. However, when you try to create transfer order based on the delivery, the system determines that the quantity in the warehouse is not sufficient to meet the quantity for the delivery. Normally, in this situation, the system would not continue with the transfer order creation. You can create a transfer order only if the items can be fully satisfied. However, there is a way to allow partial picking so that a transfer order can be created in spite of reduced stock.

> A delivery with two items of 50 pieces each was created. After the delivery document was created, 10 pieces of the material in the second item were issued from the warehouse so that only 40 pieces remain. When you create the transfer order for the delivery, the system issues a message that the picking quantity could not be completely filled.

To allow partial picking for goods issue for deliveries, you must change one of the default values for the warehouse. To change the warehouse data, see *Interfaces → Shipping → Define shipping control* in the *Warehouse Management IMG* documentation.

Procedure

Sometimes, it is not possible to pick goods at a later date due to organizational or technical reasons. In this case, the customer can make a partial delivery. If the customer is to receive a partial delivery, you need to change the quantity in the delivery.

1. Choose *Delivery → Change* from the SD Shipping menu bar.

2. On the initial screen enter the required information and choose *Overview → Picking*.

3. On the overview screen for picking, change the value in the *Delivery quantity* field to match the value in the *Pick quantity* field manually or choose *Edit → Copy the picked qty* from the menu bar.

4. To post the change choose *Delivery → Save*.

The system sets the SD picking status in the delivery document to C. Once the SD picking status and the WM activity status are set to C, you can post the goods issue to IM using the task in SD, as described above in "Posting a Goods Issue."

Picking Batches

If more than one batch is to be picked for a delivery item, this must also be confirmed in the delivery. In this case, it is considered to be a batch split. This means that for each batch, the system creates a new item in the delivery.

Creating a TO for a Cancelled Delivery

This procedure describes how to place deliveries that have already been picked in WM back into the warehouse. This is sometimes necessary if a delivery has been picked incorrectly.

For this function, you can return complete deliveries (delivery view) or individual transfer order items from a delivery (TO item view) to the warehouse.

Prerequisites

You can only return deliveries that are relevant to WM that have been fully picked (WM picking status = C). This means that transfer orders must have been created for the deliveries and they must have already been confirmed.

Procedure

1. Choose *TransOrder → Create → Cancel picking* from the WM menu bar.

2. On the initial screen you enter a warehouse number, a movement type and at least one delivery.

    The system displays movement type 999 as a default, however, you can define your own movement type for this pupose.

3. From the display screen, you can select the deliveries or TO items for materials that you want to place back into the warehouse.

    There are three options:

    –   **Return to stock:**

            The system attempts to return the quants back to the bin from which they were picked.

    –   **Putaway in the foreground:**

            The system displays a dialog box where you can specify where the quant is to be stored.

    –   **Putaway in the background:**

            The system finds a storage bin based on the putaway strategies defined in the system.

4. The system resets the picking status of the delivery accordingly.

Goods Issue Based on an IM Posting

Use

When you post a goods issue in IM, the system generates transfer requirements that are used as a basis for creating transfer orders.

Features

When you use the Inventory Management (IM) component to pick goods from the warehouse, the system posts a negative quantity to the goods issue interim storage type. For this task the system can **automatically** create a transfer requirement. Subsequently you create a transfer order based on the information in the transfer requirement. Using a predetermined search strategy, the system searches for storage bins from which the material will be picked. The transfer order is printed and the warehouse worker transfers the goods from the storage bins in the warehouse to the goods issue area. The warehouse worker confirms that the goods have been transferred and records any discrepancies between the required amount and the delivered amount.

Movement Types

Each time you have a goods issue posting for IM, you must use a respective movement type (see also: Movement Types in WM [Page 144]). All IM postings that result in a stock pick from the warehouse (that is, a physical transfer of goods out of the warehouse) are relevant for WM. The movement type determines whether the movement is relevant for WM and also provides the necessary information for further processing.
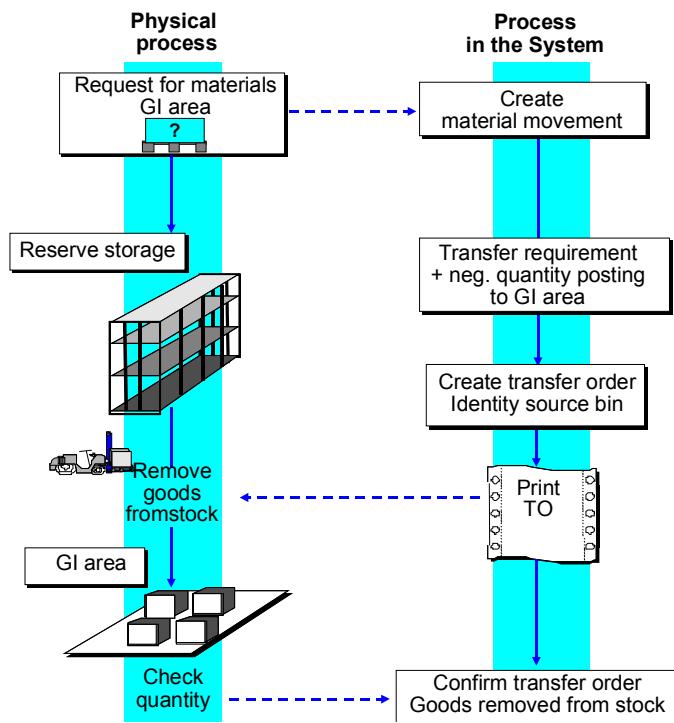
Shelf Life Expiration Date

When you create transfer orders for materials with a shelf life expiration date, you must enter the expiration date on the preparation screen. For more information about handling and evaluating materials in the warehouse with an expiration date, see Shelf Life Expiration Date [Page 118].

Example

This example illustrates what happens in the warehouse and in the IM and WM components when goods are issued.

**Physical
process**

**Process
in the System**

Request for materials
GI area

?

Create
material movement

Reserve storage

Transfer requirement
+ neg. quantity posting
to GI area

Create transfer order
Identity source bin

Remove
goods
fromstock

Print
TO

GI area

Check
quantity

Confirm transfer order
Goods removed from stock

Goods Issue to a Cost Center

To issue material to a cost center, you carry out the following tasks in the IM and WM components:

Tasks in Inventory Management

- Post a goods issue to a cost center.

Tasks in Warehouse Management

- Create a transfer order

- Confirm the transfer order after it has been created

To carry out these tasks, see

Posting a Goods Issue to a Cost Center [Page 239]

Creating a Transfer Order for a Material Document [Page 240]

Posting a Goods Issue to a Cost Center

To post a goods issue to a cost center:

1. Choose *Logistics → Materials Management → Inventory Management → Goods Movement → Goods Issue* from the SAP menu.

2. As a minimum, you must enter the appropriate movement type (201 in the standard system), the plant, and the storage location within IM. To continue the process choose `ENTER`.

3. On the item screen enter the cost center, material, and the quantity.

4. To post the goods issue, choose *Goods issue → Post* from the menu bar.

   The system returns to the initial screen confirming the creation of the goods issue.

   The system has automatically created a **transfer requirement** and has posted the quant to the goods issue interim storage area.

See also:

Movement Types [Page 144]

Overview: Transfer Requirements [Page 150]

Creating a Transfer Order for a Material Document

You can create a transfer order with reference to a number of different source documents. Immediately after posting a goods issue to a cost center in IM, you create the transfer order with reference to the material document that was just created.

Procedure

To create a transfer order based on a material document

1. Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order, Other Transactions → Putaway → Create Transfer Order → By Material Document* from the SAP menu.

2. Enter the number and year of the material document. Choose ENTER.

    The system displays the overview screen for the transfer requirement. Materials displayed on this screen will be removed from the storage bins and transferred to the goods issue interim storage area (910 in the standard system). The storage bin in the interim storage area is dynamically created from the cost center.

    From this point on, the processing of the transfer order is basically the same as creating a transfer order for a transfer requirement for picking (see Creating Transfer Orders for Putaway Manually [Page 197] and Creating Transfer Orders for Picking Manually [Page 241]).

Manual Creation of Transfer Orders for Picking

Use

You can also create transfer orders manually if you have a goods movement that only involves internal transfer of goods.

Prerequisites

A transfer requirement, a material document, or an outbound delivery already exists as a basis for the transfer order.

Procedure

1. If you wish to manually create a transfer order for a **transfer requirement**, choose from the SAP menu *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions → Picking → Create Transfer Order → By Transfer Requirement.*

   If you wish to manually create a transfer order for a **material document**, choose from the SAP menu *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions → Picking → Create Transfer Order → By Material Document.*

   If you wish to manually create a transfer order for an **outbound delivery**, choose from the SAP menu *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions → Picking → Create Transfer Order → Via Outbound Delivery Monitor.*

2. Proceed in the same manner as described under the section Automatic Creation of Transfer Orders for Putaway [Page 197].

   In the section *Stor.Type Search Seq.* you can define up to 30 storage types for the search sequence in the field *All storage types.* The system searches, row by row, for suitable storage types.

   If you select stocks, you can manually enter the quantities to be picked in the column *Selected quantity*, or you can have the system automatically calculate the quantity. For storage bins that are marked in the first tab (*Stock that can be picked*), when you select the *Calculate* button, the system calculates entries on the screen from **top to bottom** and selects the required quantity from the available stock.

   The system also accepts a smaller quantity as the open quantity. In this case, you will be notified by the system.

Goods Issue for Production Supply

Use

The Warehouse Management (WM) application component is interfaced to the Production Planning Shop Floor Control (PP-SFC) application component to assist in providing materials to supply areas in production. The significant advantage for customers using this WM-PP interface is that it provides pinpoint accuracy in timing the supply of materials to production storage bins in production supply areas.

The basic concept is for workers in production to be able to order needed materials themselves, which, in turn initiates the creation of transfer requirements in WM. Warehouse Management component, then, is responsible for supplying needed materials to the storage bins in production. It does so by creating a transfer order for each respective transfer requirement. This is part of the standard WM procedure.

The subsequent goods issue posting reduces the stock quantity of materials that have been removed from "production" storage bins and no additional activities are required in WM.

Material Staging

For each material and production supply area in a plant, you must clearly define the storage bins to which the necessary materials will be supplied and the type of material staging that will be implemented. This is known as a **control cycle**.

The system supports the following types of material staging:

- Picking Directly for a Production Order [Page 245]

- Crate Parts [Page 246]

- Release Order Parts [Page 247]

- Kanban Replenishment [Page 264]

Advantages

You can request material staging in advance so that the required materials are supplied using WM (transfer requirement / transfer order) at the correct time. Also, no further activity is required for the consumption posting.

Prerequisites

When you use the WM component the assignment of plant and storage location to a warehouse number and from plant and warehouse number to storage location must be clearly established. Within a plant, you can manage one or several storage locations per warehouse number. (See Storage Locations in TRs, TOs and Posting Changes [Page 345])

⚠️

> Using WM for material staging requires care and strict discipline in system handling. Materials may only be used for production by removing them from production storage bins that were defined for that purpose. If the needed stock is located in another location, it must be moved from that location to the production storage bin, because it is from that bin that the consumption posting will take place. If this practice is not

consistently adhered to, the efficient use of the system will be significantly hindered by the increase in unnecessary stock differences.

Features

Automatic Changes

The following changes in the production order affect the WM-PP interface:

- Changes in product quantities

- Changes in assembly part quantities

- Material changes

- Changes in work center

- Technical completion of production order

- Canceling technical completion

- Change in storage location or plant

- Batch changes (see below)

Whatever the case, the bin coordinates listed in the production order for the consumption posting are updated. Also, any existing superfluous transfer requirements for pick parts are canceled and missing quantities are requested, if necessary (only in the case of automatic requests). If a transfer order has already been created for a material supply request, it cannot be canceled. However, the additional/new material requirement is issued.

Confirmation of Batches in Fixed Storage Bins

The return confirmation of batches issued in WM for a production order can only take place for pick parts. When dynamic production storage bins are used, this confirmation takes place automatically since in this case the system carries out the assignment of batches and production orders. If pick parts are supplied to a fixed production storage bin that was defined in the control cycle during WM staging, there is no definitive assignment between the production order and the batches that are found because such bins are used for several production orders. In this case, if a notification is to take place, it must be explicitly configured as such in Customizing. (See the WM Customizing documentation under *Interfaces   Define production*.)

⚠️

> The confirmation of batches is not supported for <u>quantity reduction [Page 256]</u>.

Quantity Reduction in the Case of Surplus Quantities

When you create transfer orders for transfer requirements that include the picking requirements for a production order, the quantity can reduced if you determine that there is a surplus quantity (available stock) in the storage bin.

The reserved quantity is the quantity that was requested in orders for a particular production storage bin, minus the quantities already removed from this bin. The system only calculates positive quantities.

The reserved quantity is deducted from the total of the available stock and stock to be placed into the bin as well as the open transfer requirement quantities. The positive difference is the

Goods Issue for Production Supply

available stock that is deducted from the transfer order quantity with respect to the transfer requirement quantity.

This means that the individual tasks are clearly defined. In the production department, the WM material staging process is initiated for all released orders and the warehouse is responsible for processing all open transfer orders. During TO creation, only those quantities are transferred that have not been moved to production for other reasons.

See also:

Pick Part

Definition

A material that is made available in the quantity required in the production order.

Use

This object can be provided in a physical storage bin or in the dynamic storage bin entitled "Production Order". For this type of material staging, you can create transfer requirements in two different ways:

- Automatically or manually from a specific production order:

    You can set up the system for this to take place automatically when the production order is released.

    — or —

    You can create transfer requirements for each component manually once the production order has been released.

    Transfer requirements that are created in this manner are always based on the quantity required in the production order and the production deadlines.

- Manually using a separate transaction:

    In both PP and WM, you can use a separate transaction to create transfer requirements for parts that are needed in various quantities and at different times for a specific production order.

    The requirement number in the transfer requirement is the same as the order number. If the order number is longer than 10 digits, it is shortened accordingly.

Crate Part

Definition

Material that is stored in crates or other standard containers and is requested -- independent of existing production orders -- as the quantity defined in the control cycle. With this material staging method, you use a separate transaction to order another full crate.

Use

In the standard system, this object is always ordered manually. When a worker on the shop floor notices that a container or particular production storage bin is becoming empty, the worker uses the Warehouse Management (WM) or Production Planning Shop Floor Control (PP-SFC) component to replenish the bin using this transaction. You define the quantities required in the control cycle.

The request for the provision of these parts can be processed in the background as soon as you have entered the material, the production supply area, and the plant.

> The transfer requirement uses the production supply area as the requirement number; dynamic bin coordinates are not supported.

Release Order Part

Definition

Material that is requested, independent of the order. The requesting individual in the production department determines the amount of materials to be supplied.

Use

The amount of this object to be supplied is supported by the following information:

- Requirement quantity according to the released orders

- Stock in the production storage bin and quantity to be placed into stock (transfer orders not confirmed)

- Open transfer requirements for the production storage bin

- Warehouse stock in the replenishment storage types

In addition, you can display information on the standard pallet quantity as well as the stock in quality inspection. On the basis of this information, you determine the required quantity manually.

Depending on your selection, the data includes:

- All control cycles that define release order parts

- All reservations (components from the production orders)

- Storage bin stock in the production storage bins

- Open transfer requirements with the production storage bin as the destination bin

- All quants of the materials for determining the replenishment quantity

If you have large volumes of data, it is appropriate for performance reasons to limit the selection. In addition to the required entry of the plant and the production supply area, you limit your selection further by specifying the material, the requirements date, and/or the order number.

The transfer requirement lists the production supply area as the requirement number; dynamic coordinates are not supported.

Release order parts are scheduled manually based on the requirements of production orders, the stock levels at supply areas in the production department and available quantities in replenishment storage types.

Production workers can display an overview of all purchase orders that have been released and estimate their requirements for a particular time period. To determine the quantity to request, they can display figures on the stock levels in the production bins and in the WM storage types that are used to supply the replenishment quantities.

Setting up the Interface between PP and WM

To set up the interface between Warehouse Management and the Production Planning application components, you must carry out the following steps:

1. Define the WM movement type for material staging. WM movement type 319 has been defined in the standard SAP system for this purpose.

   To assign the movement type to replenish production storage bins, see *Interfaces* → *Define production data* in the *Warehouse Management IMG* documentation. For more information about movement types in general, see Movement Types [Page 144].

2. Define at least one storage type for material staging. Storage type 100 has been defined in the standard system for this purpose (see The Storage Type [Page 23]).

   You must define the replenishment movement type for this storage type. Do not active SU-management and do not define a putaway or pick strategy.

3. Create the Production Supply Areas [Page 249].

4. You must define and manage physical production storage bins [Page 251] using WM.

5. Define the control cycle records [Page 250] within a plant to establish how and to where a material is to be supplied within a production supply area.

6. If you want the material staging for production orders to take place automatically, you must set the *WM request* flag at the production control level. See Automatic Staging for WM [Page 256].

7. Activate the PP interface in the warehouse number record. For more information about this topic, see *Logistics Execution* → *Warehouse Management* → *Interfaces* → *Define production* in the *Implementation Guide (IMG) for Warehouse Management*.

8. If you want to use automatic staging, it is essential that the materials used in connection with this interface are assigned to a production storage location and contain a production scheduler.

   Implementing the Material Staging Process [Page 252]

Production Supply Areas

Production supply areas (PSAs) are used for material replenishment and are situated directly on the shop floor in the production department. The supply area groups work centers near production storage bins based on the material staging methods. You need to enter the PSA in the work center master data.

To create production supply areas in *Customizing for Warehouse Management* in your system, choose *Logistics Execution* → *Warehouse Management* → *Interfaces* → *Define Production*.

Creating a Control Cycle

The control cycle record is made up of the plant, production supply area and material and determines for the WM-PP interface the production storage bin and the type of material staging that is used. The production storage bin is defined by the whole key: warehouse number, storage type and bin.

You create control cycles by choosing *Logistics → Logistics Execution → Master Data → Warehouse → Production Supply → Control Cycle Production Supply → Create* from the SAP menu.

> You can also define a control cycle without specifying the material. This general entry is valid for all materials in the supply area for which no control cycle has been defined.

Displaying Control Cycles

To display a list of existing control cycles, choose *Logistics → Logistics Execution → **Information System** → Warehouse → Production Supply → List of Ctrl Cycles* from the SAP menu.

> Control cycles are managed using number ranges that are established in PP. Therefore, you should ensure that number ranges have been created for control cycles before using this interface. To create number ranges for control cycles, see *Kanban → Define number range for control cycle* in Customizing for Production.

Production Storage Bins

Production storage bins that are used for material staging are determined by the system based on the control cycle.

> ⚠️
>
> Production workers must pick parts for production **only** from production storage bins. Otherwise, discrepancies in stock quantities in WM will result.

The storage bin can be defined as a

- Physical storage bin
- Dynamic storage bin (only for pick parts – production order number)

To create the necessary physical production storage bins, choose *Master data* → *Storage bin* → *Create* from the WM menu bar..

The Material Staging Process

There are several tasks involved in the implementation of the material staging process. So that you can understand how this process takes place in the system, we describe how you can carry out the following tasks in the SAP system **manually**.

To implement the material staging process using WM, perform the following tasks in the order listed below:

Creating a Production Order [Page 253]

Displaying a Production Order [Page 254]

Releasing a Production Order [Page 255]

Displaying Transfer Requirements for Material Staging [Page 258]

Creating Transfer Requirements Manually for Material Staging [Page 259]

Processing Transfer Requirements for Material Staging [Page 261]

Posting a Goods Issue for Material Usage [Page 263]

Creating a Production Order

Before you can carry out any actions in WM to transfer materials to a production storage bin using the WM–PP interface, you must first create a production order.

To create a production order see the PP component documentation on *Production Orders*.

Displaying a Production Order

To display a production order, choose *Logistics* → *Production* → *Production Control* → *Order* → *Display* from the SAP menu.

The component overview lists all components needed to assemble the final product.

When you created the production order, several tasks were carried out. The following features are relevant for the WM-PP interface:

If you choose...	then...
Goto → *WM Pick list*	The system displays the production bin, the type of material staging, and the quantity that was already requested.
Order → *Functions* → *WM mat. provision* → *Proceed*	The system carries out material staging in the background. You can display errors by choosing *Goto* → *Logs* → *WM mat. provision* (from the *Change production order* mode.)

Releasing a Production Order

When you release a production order, the system determines the type of material staging and to which production bins the components must be moved.

If you have activated automatic staging, the system creates transfer requirements automatically in WM.

(See Automatic Staging for WM [Page 256].)

To release the production order

1. From the SAP menu, choose *Logistics* → *Production* → *Production Control* → *Order* → *Change.*

2. Enter the production order number and choose `ENTER`.

3. Choose *Order* → *Functions* → *Release*.

    Without automatic staging, you may request the pick parts normally by choosing *Order* → *Functions* → *WM mat. provision* → *Proceed* or by choosing *Goto* → *WM Pick list* in the place of Step 3.

4. Choose *Goto* → *WM pick list.*

5. Choose *Proceed* to carry out the staging of materials in WM.

Once you have released the production order, you should create and confirm transfer orders from the transfer requirements that you created to supply materials to production. This actually moves the materials to the production storage bins in the supply areas that will then be used to assemble the product requested in the production order.

Automatic Staging for WM

Use

If you have activated automatic staging, the system will request all pick parts in a production order automatically when it is released.

> The decision whether automatic staging will take place is made at the production level, not for each component.

Customer Exit for Automated TR Generation

When you use this exit, you can automate the generation of transfer requirements during WM staging for production orders. More detailed information is available in the report documentation (MWMPP001).

Prerequisites

For information on how to activate automatic staging for WM, see *Interfaces → Define production data* in the *Warehouse Management IMG* documentation.

Completeness

For automatic WM staging, you need to ensure that each transfer requirement created by the system contains all components that are relevant for WM staging. You can make a setting in Customizing that prevents the generation of incomplete transfer orders. With this setting, the system will not create transfer requirements unless it contains all relevant components. Additionally, a message is entered in the log that references this error. You define this function in the warehouse number control section in *Customizing*.

> This completeness check does not refer to the entire production order, instead, it refers only to the process concerned.

When the system creates transfer requirements, the required quantity of the components is copied over as the requested quantity as a default entry. Even when the material is not available or is only partially available, the total required quantity of the components is carried over into the transfer requirement quantity. This could result in the creation of transfer orders for production orders for which there are insufficient materials available. On the other hand, materials may only be partially supplied or not supplied at all for production orders for which the available quantity was actually confirmed.

You can define in *Customizing* that the confirmed quantity of a component is to be carried over as the requested quantity.

> This type of staging has only been implemented for pick parts since these parts are staged based on a production order.

Features

Quantity Reduction in the Case of Surplus Quantities

When you create transfer orders for transfer requirements that include the picking requirements for a production order, the quantity can reduced if you determine that there is a surplus quantity (available stock) in the (fixed) storage bin in production.

> The determination of the available quantity in the production storage bins affects system performance significantly and takes place even if it is not necessary (for example, when the requested quantity is staged in the exact amount without overdeliveries.
>
> In *Customizing*, you can switch off quantity reduction for each storage type separately if this is desirable.

Calculating the Available Quantity

The reserved quantity is the quantity that was requested in orders for a particular production storage bin, minus the quantities already removed from this bin. The system only calculates positive quantities. Transfer requirements that are created manually are **not** taken into consideration. All transfer requirements that refer to a production order are taken into consideration. In these transfer requirements, items that do not refer to open reservations (for example, transfer requirements that refer to deleted reservations or to a production order that has been technically completed) are not taken into consideration.

The reserved quantity is deducted from the total of the available stock and stock to be placed into the bin as well as the open transfer requirement quantities. The positive difference is the available stock that is deducted from the transfer order quantity with respect to the transfer requirement quantity.

The individual tasks are clearly defined. In production, the WM material staging process is initiated for all released orders and the warehouse is responsible for processing all open transfer orders. During TO creation, only those quantities are transferred that have not been moved to production for other reasons.

Optimized Database Access to Transfer Requirements

As a rule, the system accesses transfer requirements during quantity reduction via the destination storage type index. This can lead to performance problems for some combinations. As alternatives, the system can also access the transfer requirements via the material number or via a DATABASE-TABLE-JOIN. You can select this access in *Customizing* in the storage type controls under *Interface → Define production*.

Displaying TRs for Material Staging

When you release a production order, the system may generate more than one transfer requirement (TR). This happens, for example, when the production order requires picking from several production bins in the production department.

To display transfer requirements

1. Choose *Logistics → Logistics Execution → Internal Warehouse Processes → Bins and Stock → Block → Stock Figures.*

2. Enter **P** (requirement type for production supply) and the production order number on the initial screen.

> The TR number in transfer requirements created for a production order consists of two parts:

- The requirement type P

- The requirement number itself

   For pick parts, the system uses P plus the production order number as the requirement number.

   For crate parts and release order parts the requirement number is P plus the supply area designator.

Additional information in the TR header indicates that this is a special kind of transfer requirement. For example, the description indicates that the transfer requirement was generated via the WM-PP interface.

See also:

Creating Transfer Requirements for Material Staging Manually [Page 259]

Creating TRs for Material Staging Manually

To initiate the supply of materials to storage bins at production supply areas, you must create transfer requirements that are based on production orders or on material requirements in the production bins.

Transfer requirements are created on the basis of the material staging types listed below:

Pick Parts [Page 245]

To create material staging transfer requirements for a production order manually, choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions→ Prepare Production Supply → For Order* from the SAP menu.

This material staging method using a separate transaction is more flexible than creating transfer requirements from the production order because it allows you to process smaller quantities and percentages of a production order based on individual workstation requirements. To use this method, you need to deactivate automatic staging (see Automatic Staging for WM [Page 256].)

Crate Parts [Page 246]

To create transfer requirements for crate parts, choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions→ Prepare Production Supply → For Crate Part* from the SAP menu.

Release Order Parts [Page 247]

To create transfer requirements for release order parts, choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions→ Prepare Production Supply → For Release Order Part* from the SAP menu.

When creating transfer requirements for release order parts, you can display all the production orders that use the material requested in the selected supply area.

How you process subsequent screens for all three methods of material staging is generally self-explanatory and is described in the online documentation for individual data fields.

Units of Measure

It is possible for you to select a specific unit of measure for the supply of **pick parts** and **release order parts** to production. You specify the unit of measure while carrying out material staging.

When you create transfer requirements for production supply in WM (or in PP), you can select the unit of measure to be used for displaying the material staging list. Choose *Edit → Unit of Measure* on the material staging overview screen. The system displays a dialog box in which you can enter the desired unit of measure. When you select one of the options, the system displays the quantity fields in the material staging list with the unit of measure of your choice. The transfer requirements created for this material staging list will then be generated using the selected unit of measure.

The unit of measure you choose is stored in the Parameter ID "LMB", so that the next time you carry out the material staging task, the unit of measure you selected previously is automatically suggested as a default.

Setting a Default Unit of Measure for Material Staging

To set a default unit of measure for material staging, choose *Tools* → *Administration* → *User Maintenance* → *Users.* In *Parameters*, enter one of the following parameters for parameter ID "LMB":

- Blank   =   base unit of measure

- 1   =   unit of issue

- 2   =   WM unit of measure

> When you define the control cycle [Page 250] for **crate parts**, you can define any unit of measure for container quantities. The system then uses the unit of measure defined in the control cycle record when calling up material staging for crate parts.

Processing TRs for Material Staging

Once the transfer requirements for production supply have been created, you process them in the same manner as all other transfer requirements in WM. You create transfer orders based on transfer requirements and confirm them (see Transfer Orders [Page 159]).

The transfer orders created from transfer requirements

- Determine the source and destination storage bins

- represent the actual instruction to carry out the physical movement of the materials

- Move the material quantities in the system

> The system does not create incomplete transfer orders for transfer requirements. If one item (the total quantity of material in a transfer requirement item) cannot be converted, the system will not create a transfer order for the rest of the items.

Creating Transfer Orders for Material Staging Automatically

When using the WM-PP interface, you can activate immediate transfer order creation from within the material staging process.

Immediate transfer order creation means that the transfer requirement created for material staging is automatically converted into a transfer order. Immediately after the transfer requirement for material staging has been created, the system creates a transfer order in the background for this transfer requirement. If an error occurs, a corresponding error message can be sent to a particular user via the general mail control function.

You can request immediate transfer order creation manually for all material staging functions. For this purpose, users require the WM authorization "Special functions in Warehouse Management" with the setting "1".

Customizing

If material staging of pick parts is requested automatically (rather than manually) when production orders are released, you need to define the *Production control profile* to activate immediate transfer order creation.

Maintain the mail control function in the replenishment storage type or in the production storage type using the *Define storage type* task.

In the Warehouse Management movement type, you can set a switch (*Automatic TO*) that causes the system to create transfer orders automatically. To make changes to the movement types in WM, choose *Logistics Execution* → *Warehouse Management* → *Activities* → *Transfers* → *Define Movement Types* in *Customizing* for *Warehouse Management*.

See also:

Automatic/Immediate Transfer Order Creation [Page 161]

Transfer Requirements [Page 150]

Transfer Orders [Page 159]

Posting a Goods Issue for Material Usage

The final step in the material staging process is to post a goods issue for consumption. When a production order is completed, the materials have been removed from the production storage bins in the warehouse and the final product has been fully assembled, it is still necessary to balance the stock quantities in IM and WM.

You post the use of materials to the database either by "backflushing" with the completion confirmation or directly in Inventory Management. This posting is necessary to reduce the stock quantities in the production storage bins of the WM and IM components.

To post the goods issue for material usage

1. To process the goods issue in IM, choose *Logistics → Materials management → Inventory Management → Goods movement → Goods Issue* from the SAP menu.

    To process the goods issue in the PP component, choose *Logistics → Production- process → Process order → Environment → Material movement → Withdraw material* from the SAP menu.

2. Choose *To order* from the application toolbar.

    The system displays a dialog box in which you must enter the production order number as a minimum.

    When you post the goods issue, it is important that you enter the production order number. The system will only reduce the quantities in the production storage bins if you enter the production order number on this screen. Otherwise, it will post the material to the general interface and create transfer requirements.

3. Post the goods issue.

Since the transfer requirement for the production order was created far in advance of this goods issue posting, the materials are delivered in a timely manner to the production storage bins. You post the actual goods issue in IM (or in PP) **after** the product has been assembled in production. Since the production storage bin was noted in the production order when it was released, the material usage posting reduces the quantity in the production bins and no further action is required in WM.

At this point, the finished product is located in production. Follow-on functions exist in PP for further processing. If you want to store the finished product in the warehouse, settings can be made in the PP IMG to trigger a goods receipt in IM. In turn, the goods receipt in IM triggers the creation of a transfer requirement or transfer order to putaway the finished product to the warehouse. See Automatic/Immediate Transfer Order Creation [Page 161].

Kanban Replenishment

Use
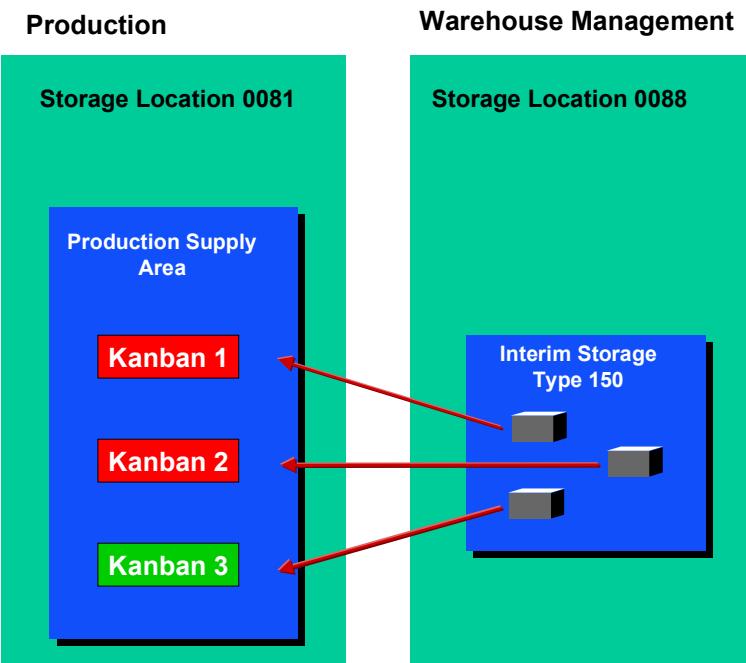
The Warehouse Management (WM) system is interfaced to the SAP Production Planning (PP) application component to replenish kanban stock to production supply areas.

Prerequisites

To activate kanban in WM, you need to take the following into consideration in the kanban control cycle:

- You need to specify replenishment strategy 0006, which is specifically defined for kanban replenishment from WM.

- For the replenishment storage location, you need to enter a WM-relevant storage location. This way, the system knows that it is dealing with a WM-relevant replenishment. In addition to the storage location, you need to enter the WM data to include the warehouse number, storage type as a kanban interface (storage type 150 in the standard system) and the storage bin.

- Kanbans are managed in their own kanban storage location that is not WM-relevant. The kanban storage location **must be different** from the WM storage location from which the replenishment materials are taken. See the figure below.

You define the strategy for the kanban replenishment under *Production* → *Kanban* → *Replenishment strategy* → *Define stock transfer strategy* in the SAP Implementation Guide.

Activities

To provide kanban replenishment from a WM warehouse to production you

- **Request the kanban replenishment**

  Workers must explicitly request kanban replenishment either manually using the PP system or by scanning a bar code.

  The system generates 1 transfer requirement with 1 item for each kanban container.

  The WM transfer requirement number is noted in the kanban itself. From the kanban, you can display the corresponding transfer requirement (TR). The WM data (storage type, storage bin) defined in the control cycle are copied into the TR.

- **Process the transfer requirement**

  You process the TR like any normal TR in WM by creating and confirming a transfer order for it.

- **Confirm the transfer order**

  Once you confirm the transfer order (TO), the system updates the kanban in PP by setting the status to "full".

Option: TO Confirmation in Production

As an alternative to confirming the TO, the confirmation of the replenishment can take place in the kanban. If you set the status of the kanban to "full", the system confirms the corresponding TO automatically.

If the TO **cannot** be processed in the background in WM (for example, zero stock check is required), the system displays an error message and the kanban is marked accordingly in the system. If this occurs, you must confirm the TO manually in WM and correct the kanban in PP.

This kind of discrepancy can be prevented by organizing working procedures in such a manner that it does not occur.

- **Carry out a stock transfer**

  After the replenishment has been processed in WM, a stock transfer results between the WM storage location and the kanban storage location. The system can process this stock transfer automatically when the TO is confirmed or you can process it manually by selecting *PostChange* → *Inventory management* → Stor.loc. to stor.loc. from the WM menu bar.

The Transfer Requirement Header

When you display the transfer requirement header, the following information is of significance:

Kanban Replenishment

- The **requirement number** (not to be confused with the transfer requirement number) in the *Movement data* section consists of the requirement type and a number. The requirement type is J (Kanban/JIT) and the requirement number is the same as the kanban number.

- If the **kanban indicator** is selected, it means that this TR is planned for kanban replenishment.

- **Destination (interim) storage type:** This is taken from the control cycle.

- **Automatic TO creation:** If this indicator is selected, automatic transfer order generation is active. When this transfer requirement is created, the system immediately creates a transfer order for it. (See the field help documentation for this indicator.)

Handling Cancelled Kanbans

If you cancel a request for kanban replenishment in production, there are several possible conditions and appropriate actions that may be necessary in PP and/or WM depending on the circumstances. The following procedure table provides the information on what you should do when a kanban is cancelled in PP.

Procedure

Handling Cancelled Kanbans

If you cancel the kanban in PP and…	Action
The transfer requirement (TR) is still open…	The system sets the header status in the TR header to "processing complete" and the kanban indicator is removed, thus cancelling the transfer requirement.
A transfer order (TO) has been generated for the TR but has not been confirmed…	In each TO item, the system makes a notation that this replenishment process was cancelled. When the TO item is confirmed, the user is informed of the cancellation process in the kanban.
• The physical movement of goods has not yet taken place…	• Cancel the TO and set the TR to "processing completed". When the "processing completed" indicator is set, the system deletes the reference in the TR and in the kanban.
• The goods have already been moved to production…	• Decide whether to leave the goods in production or move them back into the warehouse…

– If you leave the goods in production…	– Adjust the kanban quantity in the container in PP and take that into consideration when you trigger the next kanban signal for the same material.
	
	  – Confirm the TO in WM.
	
	  – Set the TR to "processing completed".

Handling Cancelled Kanbans

– If you move the goods back into the warehouse…	– If you move the goods to the source storage bin, cancel the TO and set the corresponding TR to "processing completed".
	– If you cannot move the goods back to the source storage bin, confirm the TO with the actual quantity "0" and post it using its own difference indicator to another storage bin.
	– From this storage bin, you can either place the goods back into the warehouse or use them for the next kanban replenishment.
	– Set the TR to "processing completed".

If you cancel a transfer requirement for which no transfer order has been generated, the system deletes the reference to the kanban. The kanban indicator in the transfer requirement is deleted.

In the kanban, the transfer requirement number and the status of the kanban container is reset. Also, when you delete the transfer requirement, the reference to the requested replenishment is removed from the kanban.

Material Staging for Repetitive Manufacturing

Direct, operation-based picking using pick parts and crate parts has the following disadvantages in a repetitive manufacturing environment:

- If a run schedule quantity for which material has already been staged is changed, the information about the quantity requested may be lost (for example, after a new MRP run or after any changes in the planning table) and this material may be unintentionally staged again.

- Material is always staged with reference to the dependent requirements of the planned order as saved in the database. Here, changes to the bill of materials (BOM) are not taken into account. Since the BOM is usually re-exploded in the backflush, discrepancies occur between the staged material and the quantity to be backflushed.

- Due to possible discrepancies between the planned order BOM and the current BOM, WM material staging is only possible in the pull list if dependent requirements are read from the database and are not determined by the BOM explosion.

- Staging based on quantity is not possible (for example, the provision of partial quantities cannot be carried out).

Due to the disadvantages of staging materials using pick parts, it is necessary to also support material staging using release order parts.

Advantages of staging release order parts:

- Release order parts can be supplied based on quantity. All dependent requirements calculated in the pull list (this can also occur based on the current BOM) are displayed as a total quantity for each material and supply area. In this case, you can request partial quantities and you can also change the date and time of the material provision.

- Material staging is flexible and takes place based on changes in production planning and in the BOM.

For release order parts, material staging takes place within a WM warehouse from the pull list at the inventory management level (with storage locations).

Various Views of the Pull List

In the initial view of the pull list, the system examines the individual components from the Inventory Management view, that is, at the storage location level. When calculating the missing parts quantity for the individual components, the total requirements of the selected dependent requirements are checked against storage location stock.

From the WM view, it is not precise enough to examine a production area at warehouse level since the warehouse usually also contains several other production areas, storage areas for reserved stock / central replenishment locations.

A detailed view of the stocks in individual supply areas is not necessary for the pick items since the request is always made for the complete production quantity - independent of stock already at the production line.

Material Staging for Repetitive Manufacturing

The situation for the release order parts, that is for quantity-dependent staging, is quite different. Here, quantities to be provided are planned depending on the quantity actually available at the supply area. This stock is compared with the requirement quantities.

Another view was integrated into the pull list to allow a detailed display of the stock and requirement situation within the WM warehouse and thus make it possible to selectively carry out WM staging for release order parts.

The following information is included in this display:

- Total requirements

- Stock at the production storage bin level

- Required quantity for which provision has already been organized (transfer requirement)

- Available quantity in reserved storage

- The resulting quantity still to be staged

Depending on these values, you can then initiate WM material staging.

Selection

The choice of the selection type influences which types of WM material staging are supported in the pull list. However, the pick parts can be staged via RS headers/planned orders but not with the current BOM explosion. The release order parts, on the other hand, can also be staged if the current BOM is used for calculating the dependent requirements.

WM material staging via production orders is not possible from the pull list.

Note the following in the subsequent selection screen for selection according to RS headers/planned orders:

In the pull list, the system simply compares current stocks with the requirements determined via the selection to calculate the missing parts quantity. No dynamic availability check is carried out. This is valid at storage location level in the main view as well as at supply area level (storage bin stock) in the release order part view.

Therefore, for a correct display of the missing parts situation of a component at the storage location or supply area, you must process all requirements that exist here simultaneously.

Example which would produce misleading results

- The first request is triggered for a particular production line and a period up to 10 November. All dependent requirements for this selection result in a total requirement of 100 pieces for a particular component. As no stock was found at the supply area, the complete requirement is requested, that is, the system creates a transfer requirement for 100 pieces.

- A second request for the same production line is triggered by a selection with the production period from 11–20 November. Here, the system

calculates a total requirements of 50 pieces. As a transfer requirement for 100 pieces has already been created for this material, the system creates no new request. Therefore, this selection for material staging leads to incorrect results.

The following selection is correct:

When accessing the pull list the second time, the second request should leave the beginning of the production period open so selecting all requirements up to 20 November. Now, the total requirement is 150. As a transfer requirement for 100 pieces already exists, the system should created a new request for 50 pieces.

See also:

Staging Release Order Parts for Repetitive Manufacturing

To describe changes in procedure and explain how to supply release order parts to production, we will start from the screen *"Pull List for RS Header / Planned Order"* in the PP system.

1. Choose *Logistics* → *Production* → *Repetitive Manufacturing* → *Material staging* → *Pull list* → *Trigger replenishment* from the SAP menu.

2. Select the staging type *WM rel.ord.parts* and set the respective selection criteria. Then choose *Program* → *Execute*.

   The system displays the pull list collective overview with the total quantity of materials required (at the storage location level) next to the missing quantity that is still needed for manufacturing. On this screen, the materials that are relevant to material staging in WM are listed with a staging indicator.

3. To display the release order parts for processing, select materials with staging indicator 3 and choose *Edit* → *WM material staging* from the menu bar.

   The system displays the WM Material Staging dialog box.

   From this dialog box, you can carry out material staging for pick parts and release order parts. You have three options:

   - Display

   - Online (Execute in Foreground)

   - Background (Execute in Background)

   If you choose *Online* and more than one production supply area (PSA) is involved, the system displays a second dialog box from which you can select one or more PSA.

   After you have selected the PSAs, the system displays an overview screen for WM material staging of release order parts. On this screen, for each production supply area (PSA), the system displays the requested quantities, the quantities for which a transfer requirement has already been created, the available quantity in the production storage bin and the quantity in reserve storage for the individual material components. You can manually change the quantity to be supplied and additional information for the creation of the transfer requirement, such as the time and date for material staging.

4. As soon as you have modified the requirement quantity to meet your requirements, choose *WM material staging* to initiate material staging for the PSA. To process additional PSAs, choose *Edit* → *Next PSA.*

   When you choose *Save*, all previously initiated material staging transactions are saved and the system returns you to the WM Material Staging dialog box.

Multiple Processing

Use

The multiple processing task makes it possible for you to group several transfer requirements or deliveries together and process them at one time. Instead of processing each transfer requirement or delivery individually, you can select these documents from a **multiple processing list** and create transfer orders for them in a single transaction.

There are two possibilities to implement multiple processing:

1. You can select deliveries or transfer requirements from a display list and create transfer orders directly from the selection list.

2. You can combine deliveries or transfer requirements, assign them to a group and then create the transfer orders for the group.

This function uses tabs and table controls on most of the multiple processing screens. For the assignment of groups and multiple processing for both deliveries and transfer requirements, there are three tabs:

- *Entries to be assigned*

- *Assigned entries*

- *Processed entries*

How you select items to process transfer requirements and deliveries is described in the corresponding procedure topics.

Additionally, the follow-on screens which list the transfer orders that were created and the detail screens as well as the follow-on functions (*Start multiple processing* and *Release/Print* groups) also include table controls.

Advantages

The advantages of multiple processing includes:

1. Separation of similar warehousing transactions.

2. More rapid creation of transfer orders.

3. Optimization of warehouse movements.

4. Overall monitoring of movement transactions.

Using the Display List

For this process, you use the normal warehousing task to display a list of open transfer requirements. Afterwards, you select the transfer requirements you want to process and create the transfer orders directly from the transfer requirement display screen.

Using Groups

You group several transfer requirements or deliveries together using a single **group number**. At this point you have the option to immediately start multiple processing using the group number to create transfer orders, or you can process them at a later time.

Multiple processing using groups is a four-step process:

Multiple Processing

1. Select the transfer requirements or deliveries and assign them to a group.

2. Start multiple processing and create the transfer orders using the group number.

3. Release the group for printing (or transmission to an external system).

4. Confirm the group.

Selecting TRs for Multiple Processing

Using the Display Task for Transfer Requirements

When you display a list of transfer requirements, you can select one or more transfer requirements and start the process to create transfer orders. See Displaying Transfer Requirements [Ext.] for a complete description of how to display and select the transfer requirements.

For this type of processing, choose *Environment → Create TO in background* from the transfer requirement display screen. The system will inform you of the transfer order processing status.

Assigning a Group Number

To assign a group number to process a group of transfer requirements:

1. Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions → Picking → Group of Transfer Requirements → Create* from the SAP menu.

2. As a minimum, you must enter the warehouse number. To continue, choose *Goto → Display list*.

   💡

   If you accept the system default of * for the *Transfer type* data field, the system displays the summary information about open transfer requirements. However, on this screen you cannot select any transfer requirements yet. In this case, you can select *New selection* to enter a transfer type.

   On the preparation screen, the system displays three tabs. The *Entries to be assigned* tab displays summary information about the open transfer requirements and items, grouped by movement type.

   💡

   Buttons at the bottom of the multiple processing preparation screens are used to manipulate entries in each of the tabs.

3. To select a group of transfer requirement items, mark the line(s) with the desired movement type(s) and choose *Calculate*.

   The system copies the values for the marked line(s) into the fields in the *Selected* column. You can also manually enter values into these fields. For manual entries, the system randomly selects items from the movement type for processing.

   💡

   You can also double-click an entry to view and select individual transfer requirements for a group. In the detailed list that appears, you can select a column header and sort the entries in that column in ascending or descending order. Here, you can mark entries and choose ENTER to select items for processing.

4. To create the group, choose *Group → Assign* or *Group → Assign and start* from the menu bar.

   The system displays a dialog box in which you can enter a description for the group.

Selecting TRs for Multiple Processing

You can either specify an external group number or you can allow the system to assign a group number internally.

If you decide to enter an external group number, you enter it on the second line of the dialog box under the description. The system checks the group number you specify for admissibility. The external group number is not allowed if:

- The number lies in the future of a number range for group numbers

- The number has already been created in the group number table

- The number lies in the future of the current number range

5. Enter the description (and external group number if desired) and choose *Continue* or `ENTER`.

   The system moves the newly created group to the *Assigned entries* tab

6. At this point you have three options:

   a) You can end the assignment task by choosing *Back*. At a later time, you can create transfer orders for the group. (See .)

   b) You can create the transfer orders from the *Assigned entries* tab by choosing *Goto → Start multiple processing*.

      The system displays a window with the group number and your description.

   c) You can delete the group by choosing *Group → Delete*. If you delete the group number for an entry, these items are returned to the pool with entries that are to be assigned. You can then reassign these items to a new group.

7. If you started multiple processing, select the appropriate group number and choose *Choose*.

   The system displays the results summary screen with a message that the transfer orders were created.

   On this screen, if you choose *Display details*, the system displays a list of all source documents and information about transfer orders that were created. If errors occur, the system displays an error text and provides an opportunity to correct the error and create transfer orders for the transfer requirement.

Selecting Deliveries for Multiple Processing

As with transfer requirements, you can also create transfer orders for several deliveries at once using multiple processing. This procedure is basically similar to the one for multiple processing of transfer requirements. This procedure is described in detail under Selecting Transfer Requirements for Multiple Processing [Page 275].

For this process, you group several deliveries together and assign them to a group. Afterwards, you create transfer orders and print the associated documents using the group number.

To select the deliveries that you want to group together using a group number, choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Wave Picks → Create → Via Outb.Delivery Monitor* from the SAP menu.

On the preparation screen for grouping deliveries, you have three options for choosing the picking data:

- Only picking without WM

- Only WM Picking

- Both Picking Types

You can also choose deliveries that belong to an SD group for collective processing by entering the group number in the field *Group* under *Doc.data*.

Sample Report: Multiple Processing Selection

Purpose

The report RLSAMM01 can be used as a sample report for selecting deliveries for multiple processing in Warehouse Management (WM). It is defined for foreground and background processing. In the standard SAP System, you can select deliveries or transfer requirements for multiple processing via online transactions. However, this action should primarily be performed in the background. The deliveries or transfer requirements should be selected according to certain criteria and distributed according to different algorithms between group numbers without the end user having to intervene.

The criteria for selection and distribution can differ greatly depending on the customer. Therefore, you should use RLSAMM01 as a basis to create your own report with your own criteria.

> The report processes the selected deliveries and transfer requirements in the background. It is carried out in several steps, which are described in detail in the online documentation for the report.

When should you use this report?

The sample report RLSAMM01 was developed because individual needs cannot always be met in the SAP standard system. You should use this report as a reference for potential customer-specific processing of deliveries selected for multiple processing.

The function module **L_REF_CREATE** is responsible for actually creating the multiple processing task. This function module is also provided for external use.

See also:

Function Modules and Customer Exits in WMS [Page 62]

Creating Transfer Orders for a Group

To create transfer orders for transfer requirements or deliveries that have been grouped together with a group number:

1. Choose *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions → Picking → Create Transfer Order → By Group* from the SAP menu.

2. Enter the warehouse number, group number, and reference document type.

3. Choose *Start multiple proc.*

    If you have not entered a group or a reference document type, the system proposes the reference document type on the next screen. Select a reference document type and choose *Groups*.

    If you have entered a group, the system displays a list of the available groups for deliveries and transfer requirements.

4. Select one or more groups, and choose *Start multiple proc.*

    The system displays three tabs:

    – *Active work list*

    – *Inactive items*

    – *Processed items*

        When you are creating transfer orders for groups, the system takes into account all the items in the column *Selected Quantity* in the *Active Worklist.*

        If you wish to process certain items later on, you can move the respective items into the list *Inactive Items* by selecting the items and then choosing *Inactive*.

        In the tab *Processed Items,* you see a list of those items for which a transfer order has already been created during the current processing activity.

5. To generate transfer orders for groups in the active work list, you have several options from the overview screen, depending upon the movement type. Select the corresponding menu option to

    – Generate a transfer order item

    – Display stocks

    – Display or change the storage type search sequence

6. To complete the transaction, choose *Transfer order → Post.*

    When the system has completely processed the group, it displays the results summary screen.

7. To display detailed information about the group, mark the respective line and choose *Goto → Display details*.

Releasing Groups

Once you have assigned deliveries or transfer requirements to a group, you can release groups at a later time. Two things can happen when you release a group:

- The system prints the transfer order documents.

- Depending on the configuration, the system initiates an order for communication records to be sent to a warehouse control unit. (See the section *Sending Communication Records to a Warehouse Control Unit* below.)

Printing Transfer Order Documents from a Multiple Processing List

To print transfer order documents from an multiple processing list, choose *TransOrder* → *Multiple processing* → *Release/print* from the WM menu bar.

In some cases, you may want to create transfer orders using the multiple processing function, and print the documents for them at a later time.

The prerequisite for using this option is that you have set up the print parameters for picking lists so that documents are not printed as soon as the transfer orders are created.

To reprint existing picking lists that have been released and printed previously, choose *TransOrder* → *Print* → *Pick list (reprint)* from the WM menu bar.

See also:

Printing Transfer Orders and Labels [Page 170]

Sending Communication Records to a Warehouse Control Unit

The release of communication records to a warehouse control unit (WCU) takes place as follows:

1. When the system creates transfer orders for multiple processing (using a group number), each transfer order item intended for a WCU is sent in the form of an intermediate document (IDoc) to a WCU.

2. When a group is released, the system also sends a "release record" in the form of an IDoc to all WCUs affected by the group. Once the communication record is sent, the processing of the transfer orders in the multiple processing list can begin.

For information on how to set up WM for interaction with an automated storage and retrieval system, refer to Automated Warehousing Systems [Page 487].

Confirming TOs for a Group

To confirm a group of transfer orders that have been created from transfer requirements or deliveries that were assigned to a group

1. Choose *Logistics → Logistics Execution → Inbound Process→ Goods Receipt for Inbound Delivery → Putaway → Confirm Transfer Order → Collective Processing* from the SAP menu.

2. Enter the warehouse number, group number (or a range of group numbers) on the initial screen and choose *Program → Execute*.

See also:

Confirming Transfer Orders [Page 175]

Partial Processing of TRs and Deliveries

It is possible for you to determine whether the stock quantities in a transfer requirement or delivery have been partially processed when the system creates transfer orders during the multiple processing task.

You can call up two functions from the final screen for multiple processing.

- If the system could not create a transfer order for a transfer requirement or delivery during background processing, you can access transfer order processing for selected reference documents in the foreground at a later time.

- From the detail screen, you can also delete a transfer requirement or delivery from a group number.

To allow partial processing for multiple processing see the *Warehouse Management IMG* documentation.

Analysis of Groups

The Warehouse Management system provides an analysis of groups with regard to the degree to which they have been processed.

Procedure

To access this analysis report

1. Choose *Logistics → Logistics Execution → Information System → Warehouse → Collective Processing → Analysis of Groups* from the SAP menu.

2. As a minimum, enter the warehouse number and creation date on the initial screen and choose *Program → Execute*.

   WM analyzes groups assigned to transfer requirements and deliveries from the following perspectives:

- Newly created groups

- Existing active groups

- Groups completely processed by transfer orders

- Released or printed groups

- Total number of groups

- Information about open transfer orders

3. Position the cursor on a value in one of the matrix fields and choose *Goto → Overview groups*.

   The system displays the *Selective Overview* screen for groups associated with your selection. From this point you have several options. You can

- View the reference documents in the group

- View the transfer orders associated with the group (if any were generated)

- Start multiple processing for the group

- Release/Print the combined pick list

- Display the picking progress report

Picking Progress Report

This function allows you to monitor the progress of picking in the warehouse. It provides a data list as a quick overview of the status of picking stock for transfer orders in a group (wave).

To execute the picking progress report

1. Select a group from the *Selective Overview* screen and choose *Goto → PickProgress*.

   You can also access this report from the Shipping menu bar (*Logistics → Sales → Shipping → Picking → Wave Picks → Monitor*).

2. Enter the report criteria on the initial screen and choose *Program → Execute.*

Analysis of Groups

The system displays the picking progress list.

If you select a table matrix and choose *Goto* → *Display open TOs*, you can branch to a TO item screen and process (confirm) them from within this report.
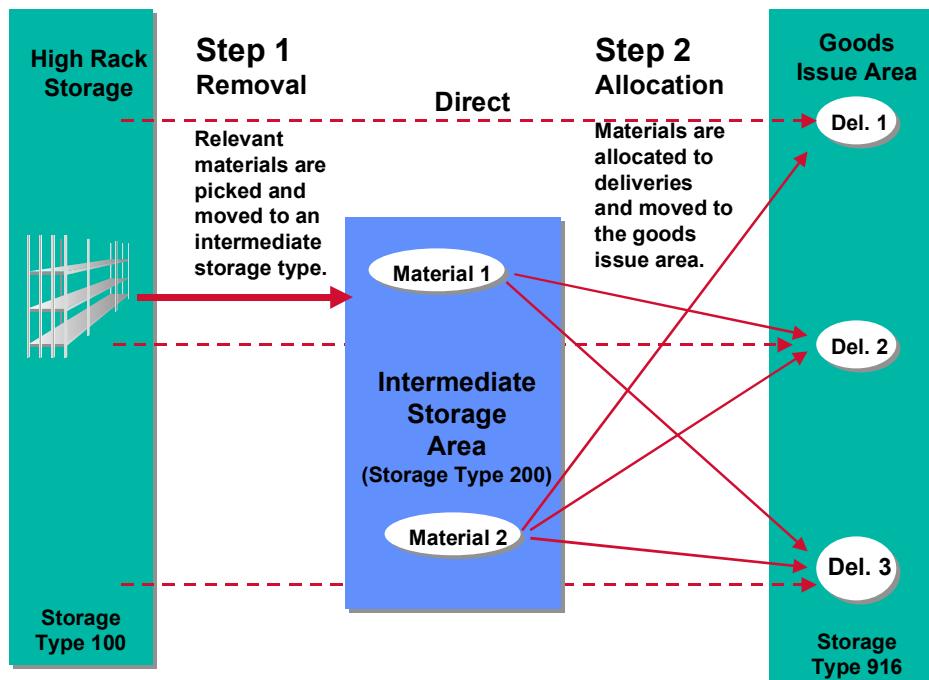
For a full description of this function, see the documentation for report RLLT2900.

2-Step Picking

Use

For 2-step picking, the picking process is divided into 2 separate steps. In the first step, you pick the entire quantity of materials need to fill requests (several deliveries or transfer requirements). During the second step, you divide up the materials and allocate them to match the corresponding requirements.

Two-step picking can be used to pick materials for both deliveries and transfer requirements.

Two-step picking includes three different processes:

- Removal

  During the removal process, the cumulative quantity of each material required in reference documents (deliveries or transfer requirements) is picked from bulk or random storage and moved to an intermediate storage area.

- Allocation

  During the allocation process, the cumulative quantities of materials are divided up to match the individual requirements in the reference documents and distributed to the appropriate goods issue area.

- Direct picking

  Direct picking takes place when two-step picking is material-dependent (defined in the material master). In other words, part of the material is picked using the 2-step method and part of the material is picked directly from the warehouse.

Prerequisites

Before using the 2-step picking function, you must activate it and define control parameters in the *Customizing* application.

To activate 2-step picking for deliveries, see the Warehouse Management IMG documentation under *Interfaces → Shipping → 2-step picking.*

To activate 2-step picking for transfer requirements, you define control data under *Activities → Transfers → Set up 2-step picking for transfer requirements*.

Features

- You can activate 2-step picking separately for deliveries and for transfer requirements. You can activate 2-step picking for each material separately. For this "material-dependent" picking, you define in the material master record whether the picking is to take place directly from the warehouse or using the 2-step process.

- The relevance for 2-step picking is determined when the system generates the reference documents (deliveries or transfer requirements). The system marks the relevant items in the reference documents accordingly.

- Two-step picking was developed using the group as a basis. The group number serves as a means to combine several reference documents that are to be processed in a single picking process. The system accumulates quantities of each material to be removed using the group number. You can also use the group number to allocate materials to the individual requests for multiple processing. Additionally, you can carry out other functions associated with the group, such as printing and confirmation.

- After the reference documents have been assigned to a group, you can influence the relevance at the level of the material and at the level of the reference document. Additionally, customers can redefine their own 2-step picking characteristics via customer exit MWM2S001.

- For 2-step picking, the following functions have been developed:

  – After you have created the group, you can display the 2-step relevance of materials in the group. You can influence the 2-step relevance of each of the materials in a group manually using a maintenance function (*Transfer order → 2-step picking → Redefine*). You can activate the customer exit (MWM2S001) from within this function.

  – The system generates transfer orders using a group number to remove the accumulated quantities of material.

  – Using an evaluation function, you can analyze groups that are relevant for 2-step picking.

- Two-step picking is imbedded in the following functions:

  – You can change or redetermine the relevance of materials for 2-step picking manually when you create the group.

  – When you print or confirm the group, you can select the individual steps of 2-step picking.

2-Step Picking Process

Purpose

Using this picking method, you can optimize the picking process. This picking method is especially useful when you pick large quantities of material for process-oriented picking such as picking waves or for a transport.

Advantages

Advantages of the 2-step picking process included the following:

1. The total quantities of materials needed are picked in the first step. Therefore, the removal for the individual requirements (deliveries and transfer requirements) is optimized in the warehouse. Since you can pick full storage units or larger quantities of materials from the storage bins, the total number of picks required is reduced.

2. Two-step picking makes it possible for you to optimize picking by using a picking strategy that is based on quantity (strategy M).

3. Since picking and allocation are completely separate steps, you can also confirm them separately.

4. You can monitor each step of the 2-step picking process in detail at any time.

2-step picking is carried out as a two-step procedure. Picking and the allocation of the total quantity to the individual requirements takes place in two separate steps. In the first step, you pick the total quantity of one or several materials from storage, move it to an intermediate storage area and confirm it. During the second step, you divide up the materials and allocate them to the different requirements. You then confirm these transfer orders individually.

Process Flow

1. Assign reference documents (transfer requirements or deliveries) to a group.

2. Carry out the first step (picking).

   Pick the materials that are designated for 2-step picking from high rack or reserve storage.

3. Confirm the pick transfer orders.

4. Carry out the second step.

   How you carry out the **second step** depends on the work process in your warehouse.

   See:

Work Method 1: Delivery to Goods

When picking takes place based upon the method "Delivery to Goods", the individual requirements draw from the material quantities that were staged as a result of the pick. In other words, after the pick step has moved the total required quantities from the warehouse to the interim storage area, you pick the materials from the interim area. The allocation – the actual picking for the individual requirements – cannot be started until all materials for the pick have been staged to the interim storage area.
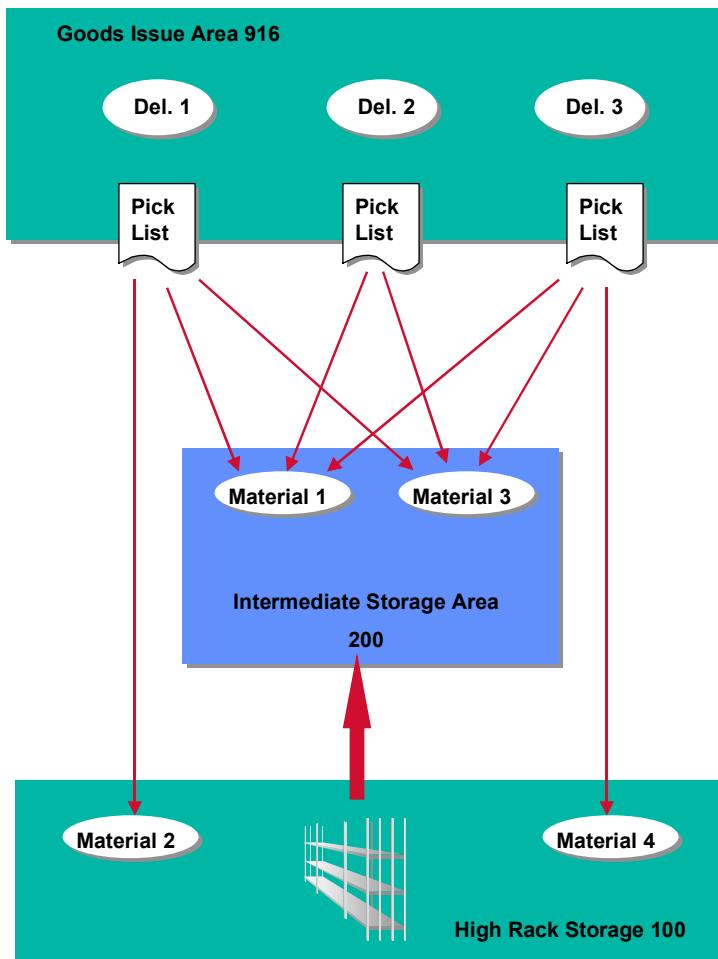
The system supports the two following types of allocation:

- Picking for individual requirements

- Picking for several requirements

Picking for Individual Requirements
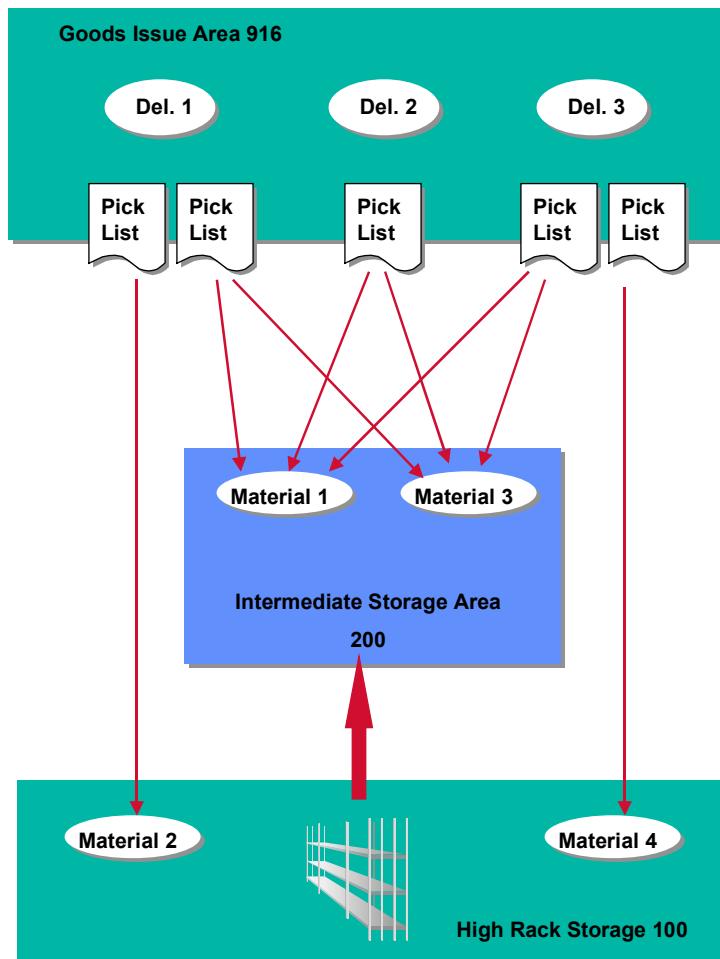
When picking for individual requirements, you pick for each requirement (delivery or transfer requirement) separately. The basis for this is a pick list that is generated when the system creates a transfer order for a delivery. The transfer orders are created either individually for each requirement or as a multiple process. The pick lists (transfer order documents) must always be printed for each requirement.

If the complete picking process is carried out by a single picker, only one pick list is needed. However, if the allocation and direct picking is performed in two separate picking processes, separate pick lists are needed. For this purpose, the transfer order split can be used to generate separate transfer orders and pick lists. In this case, it is also possible to confirm transfer orders for allocation and direct picking separately.
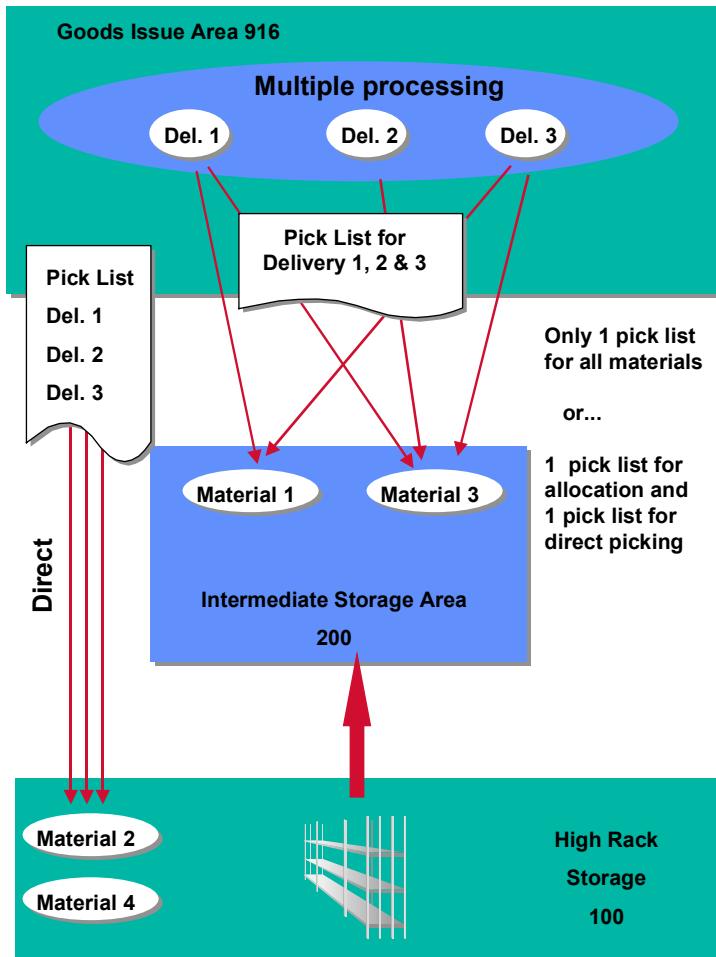
Work Method 1: Delivery to Goods

Picking for Several Requirements

When you pick for several requirements, picking takes place in a single process for all requirements (deliveries/transfer requirements) that were assigned to a group. For this process, one pick list per group is needed. The system generates the pick list for transfer orders that were created using multiple processing for a reference number. Using various selection criteria in this function, you can optimize picking, and the individual delivery items in the pick list can be sorted accordingly.

In this case, it is also possible for the entire picking process to take place using one pick list or you can divide it up for allocation and direct picking. If the processes are separated, you need to print the pick lists separately for allocation and direct picking. For this process, you can also confirm the transfer orders for each of the two steps separately.
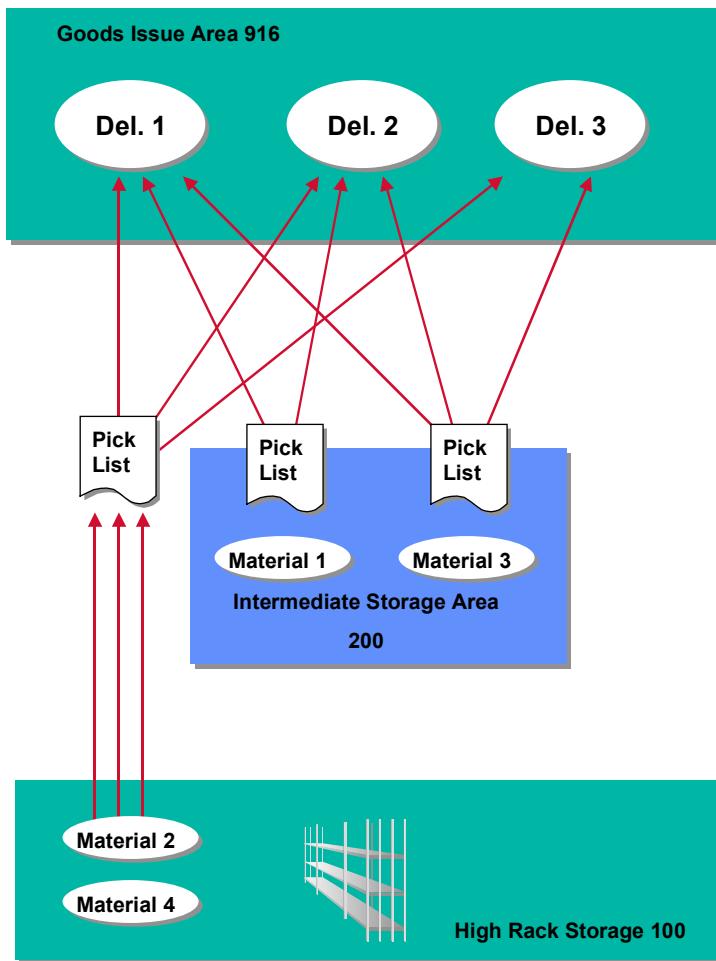
> For stock that is already located in the intermediate storage area, you have the option of using the normal multiple processing function independent of the 2-step picking process.

Work Method 2: Goods to Delivery

When the work method "Goods to Delivery" is used, the quantity that was staged during the removal step are allocated to the individual requirements (deliveries or transfer requirements).

Using this method, picking is carried out separately for allocation and direct picking. For this method, two separate pick lists are also necessary. Allocation is based on the materials, that is, the entire quantity of a material is allocated to the corresponding requirements. When allocation takes place, the system must have already created the transfer orders for all requirements in a group. You must sort the pick list according to material number. As a result, this means that the system must create the transfer orders using multiple processing.

> If the allocation of a material is considered to be a picking process, it cannot be explicitly confirmed. This process cannot be portrayed as a transfer order. Instead, it

is listed as a separate process in the pick list but one that is not calculated as a document in the system.

How to Carry Out 2-Step Picking

Prerequisites

Before using the 2-step picking function, you must activate it and define control parameters in the *Customizing* application.

Procedure

Using the 2-step picking method, you can pick materials in both deliveries and transfer requirements (reference documents). However, two-step picking can only be carried out if the reference document is assigned to a group number.

> To demonstrate how this works in the system, the **manual** procedure is described below using **deliveries** as reference documents. These instructions apply to both deliveries and transfer requirements.

> For deliveries, you can create transfer orders to pick materials directly from the warehouse using the normal procedure (*Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Create Transfer Order → Single Document*). However, If you do this for a delivery that contains a material that is designated for 2-step picking, the 2-step picking relevance for these materials will be removed.

1. To select deliveries for two-step picking, select the following in the SAP menu: *Logistics → Logistics Execution → Outbound Process → Goods Issue for Other Transactions → Picking → Create Transfer Order → Via 2-Step Picking*.

   The information regarding materials that have been designated for 2-step picking is available in the system in all places where groups can be assigned.

2. To assign deliveries to a group, select the following in the SAP menu: *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Wave Picks → Create → Via Outbound Delivery Monitor*.

   (In process)

   The system displays a dialog box that provides several options for processing data using 2-step picking. This box only appears if you have activated 2-step picking in *Customizing*.

   There are several options that you can access from this dialog box:

   - If you change the ***Relevancy*** field to blank (2-step not relevant), none of the materials will be picked using the 2-step process.

   - If you select *Do not define* (system default), the system leaves the 2-step relevance as it was in the deliveries when they were originally created.

In each reference document, information exists that indicates whether or not picking is supposed to take place in 2 steps.

- If you select **Background**, the 2-step relevance is redetermined. If any changes were made to the 2-step relevance in the materials between the time the deliveries (transfer requirements) were created and the display of this screen, these will be taken into consideration for this group number.

- If you select **Foreground**, you can redefine the 2-step relevance for this group number. The system issues the group number and a new window displays the materials and the status of the 2-step relevance. Several options are available from this window. You can

  – Activate or deactivate the relevance for 2-step picking for a particular material. For example, you can assign the 2-step picking process for **all materials** in the group even if one of the materials would not normally be picked using the 2-step procedure.

  – Determine 2-step picking again -- The system checks the 2-step relevance defined in the material master records and sets all materials to the appropriate status.

  – Double-click the mouse on any quantity field to display the delivery numbers assigned to this group number and other information.

    From this second dialog box, you can

    - Change the relevance of each delivery for 2-step picking

    - Select each delivery separately to view details of the delivery

    - Select delivery items to see additional details

  – Use the list viewer to custom-design the display of data on your screen.

  – Sort the materials in the group number in ascending or descending order.

  – Display a log related to incorrect data in reference documents.

In the standard system, either all positions are relevant for 2-step picking or you define the 2-step picking relevance in the material master record. In most cases, the system notes the relevance of a material for 2-step picking when you assign the reference documents to a group number.

If this is not sufficient for your needs, you also have the option of defining your own control parameters using customer exit MWM2S001.

If necessary, you can redefine the relevance of reference documents or materials that are assigned to a group by selecting *Transfer order → 2-step picking → Redefine*. The only time that it should be necessary to redefine 2-step picking is when you are using a customer exit with different parameters than those that are defined in the system.

3. To start the **first step** of 2-step picking, choose *2-step picking → Start removal 2-step picking* from the WM menu bar.

How to Carry Out 2-Step Picking

> Movement type 850 (in the standard system) is taken from the Customizing table. You can also enter a movement type manually.
>
> It is important that you define Strategy R for both the putaway and picking strategies in the intermediate storage type record that is used for the staging of materials during 2-step picking. Strategy R uses the group number as a dynamic storage bin for movement purposes. (You can also define a specific storage bin in the movement type for this purpose.) You can also use a fixed bin storage type or a bin in open storage depending upon how you want to handle this process in your warehouse.

4. After the first step is completed and the materials that are relevant for 2-step picking have been moved to the intermediate staging area, you have two choices to carry out the **second step**:

- You can start the multiple processing function to create TO's for the group number and move them all at once using multiple processing to the appropriate goods issue area. (*TransOrder → 2-step picking → Allocation/Direct picking → Start Group*)

- When you release the group number, (*TransOrder → 2-step picking → Allocation/Direct picking → Release / Print*) you can select *Allocation* or *Direct* separately in a dialog box to move the materials for the second step. You can also print from this option.

Result

For multiple processing, the system creates the transfer orders all at once, but you can confirm them separately (for example, by 2 or 3 different pickers).

If it is advantageous to your company, you can release the materials in the group numbers separately.

- Section Key

    – to a picker for materials in the intermediate staging area 200

    – to a sub-system

- Direct

    – from High Rack Storage to the goods issue area

Using the Analysis Tool for 2-Step Picking

Prerequisites

The analysis tool for 2-step picking uses traffic light icons to display the status of groups. Before you can use this tool, you must have assigned reference documents (deliveries or transfer requirements) to a group.

Procedure

To call up the 2-step picking analysis tool, choose *Logistics → Logistics Execution → Information System → Warehouse → Collective processing → Analysis of groups* from the SAP menu.

If you choose *Analyze → 2-step picking*, the system goes directly to the status screen.

From the analysis function, you can perform many functions related to group numbers associated with 2-step picking. You can

- Create, display and confirm transfer orders

- Release groups for multiple processing

- Redefine the relevance of materials for 2-step picking

- Display information in a group

Bestandsfindung

Verwendung

Mit der Bestandsfindung können Sie auf der Grundlage vorgegebener Customizingeinstellungen Strategien für die Materialentnahme bei Warenausgängen und Umlagerungen einsetzen. Dabei ermittelt das System ausgehend vom erfaßten Materialbedarf, in welcher Reihenfolge aus welchen Lagertypen und aus welchen Beständen das gewünschte Material entnommen werden soll.

Die Bestandsfindung ermöglicht es Ihnen, bei der Transportauftragserstellung Warenbestände aus unterschiedlichen Bestandskategorien zu ermitteln. Damit können Sie z. B. in Ihrem Lager sowohl nach eigenem Bestand als auch nach Konsignationsbestand suchen.

Integration

Wenn Sie die Bestandsfindung aus der Komponente *Bestandsführung* (MM-IM) mit der Lagertypfindung der *Lagerverwaltung* (LE-WM) kombinieren, legen Sie fest, wie das *Warehouse-Management-System* (WMS) die von der Bestandsfindung ermittelte Entnahmereihenfolge mit den eigenen Auslagerungsstrategien verknüpft.

Voraussetzungen

Um mit der Bestandsfindung arbeiten zu können, nehmen Sie die folgenden Einstellungen vor:

- Sie legen im Customizing der *Materialwirtschaft* unter *Bestandsführung und Inventur → Bestandsfindung →* Strategie für die Bestandsfindung definieren [Ext.] eine anwendungsübergreifende Strategie für die Bestandsfindung fest, nach der das System die Bestände abbauen soll. Sie bestimmen jede Strategie eindeutig auf Werksebene anhand einer Bestandsfindungsgruppe und einer Bestandsfindungsregel. Siehe Anlegen von Bestandsfindungsstrategien [Ext.].

- Sie ordnen dem betroffenen Material im Materialstammsatz eine Bestandsfindungsgruppe zu.

- Im Customizing der *Materialwirtschaft* unter *Bestandsführung und Inventur → Bestandsfindung → Bestandsfindungsregel in den Anwendungen zuordnen →* Lagerverwaltung [Ext.] ordnen Sie die Bestandsfindungsregel der Anwendung Lagerverwaltung zu.

Funktionsumfang

Sie können die folgenden Bestandsfindungsstrategien festlegen:

- **WMS dominiert**

  Das Warehouse-Management-System WMS lagert unabhängig von der Bestandskategorie der Materialien die erforderlichen Mengen aus und berücksichtigt dabei nur die im WMS definierte Auslagerungsstrategie (z. B. FIFO). In diesem Fall wird das älteste Quant ausgelagert, unabhängig davon, ob es sich dabei um eigenen oder Konsignationsbestand handelt.

- **WMS-Lagertypfindung dominiert**

  Das WMS berücksichtigt bei der Auslagerung zunächst die in der Auslagerungsreihenfolge angegebenen Lagertypen. Dabei entscheidet innerhalb der

einzelnen Lagertypen die Bestandsfindungsstrategie, welche Quants zur Auslagerung herangezogen werden.

Gemäß der Lagertypsuchreihenfolge soll die Ware aus dem Hochregallager ausgelagert werden. Innerhalb dieses Lagertyps bestimmt die Bestandsfindungsstrategie, daß zunächst Material aus Konsignationsbestand für die Auslagerung bereitgestellt werden soll. Falls solcher Bestand nicht vorhanden ist oder nicht ausreicht, soll gemäß der Bestandsfindungsstrategie eigener Bestand ausgelagert werden.

- **Bestandsfindung dominiert**

   Das WMS berücksichtigt bei der Auslagerung zunächst die Bestandskategorien, die gemäß der Bestandsfindungsstrategie für die Auslagerung vorgesehen sind. Dabei durchsucht das System alle Lagertypen der Auslagerungsreihenfolge nach entsprechendem Bestand an der gesuchten Bestandskategorie.

   Gemäß der Bestandsfindungsstrategie soll zuerst Konsignationsbestand des Lieferanten X und danach eigener Bestand ausgelagert werden. Das System durchsucht dabei alle Lagertypen der Auslagerungssuchreihenfolge (z. B. 1. Hochregallager, 2. Blocklager, 3. Kleinteilelager). Wenn kein Konsignationsbestand vorhanden sein sollte, sucht das System anschließend in den Lagertypen der Auslagerungssuchreihenfolge nach eigenem Bestand.

WM Interface to Quality Management

This section contains the following topics:

How the QM Interface Process Works
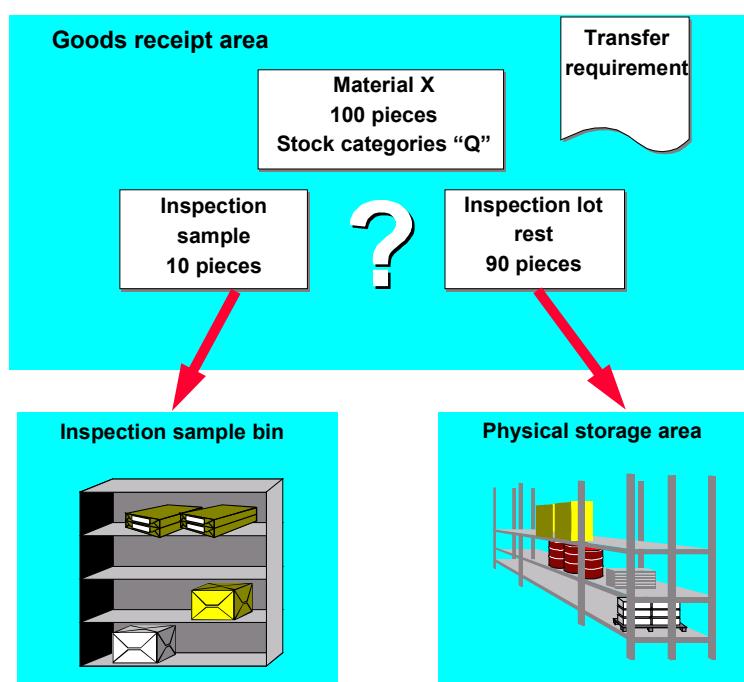
The Warehouse Management (WM) application interface to the Quality Management (QM) component allows warehouse administrators to manage and track inspection lots that are stored in the warehouse.

The primary processes in the interface between WM and QM function as follows:

1. Based on the inspection data in the QM view of the material master, the system can create an inspection lot when you post a goods receipt in the Inventory Management (IM) component. The QM inspection data also determines whether an inspection lot is to be inspected with an inspection plan and determines the quantity of the material that is to be selected as an inspection sample.

2. In WM, the normal process takes place for the goods receipt posting in IM — the system creates a quant in the interim storage area and, depending upon the system definition, a transfer requirement in WM. An inspection lot number is noted in the quant in the interim storage area and in the transfer requirement. The system stores the interim storage bin coordinates in the inspection lot itself.

3. If a usage decision has not yet been made for the inspection lot, the system displays a dialog box to inform you that a sample quantity exists when you process the transfer requirement for the goods receipt in WM. (This dialog box can also be processed in the background.)

4. In QM, a usage decision is made after the inspection has been completed. The resulting postings are passed on via the IM component to WM and there they initiate stock removals or posting changes. For more detailed information, refer to the section Examples: Making a Usage Decision [Page 305].

Making Stock Placements Using the QM Interface

Purpose

Once materials have been inspected, a usage decision must be made in the QM component. How transfer requirements are handled varies depending on the situation.

For stock placements based on transfer requirements that contain an inspection lot, two different situations exist:

- The usage decision in QM has not yet been made.

- The usage decision in QM has already been made.

For each of these situations, how you process the transfer requirement is described below.

Process Flow

1. The usage decision in QM has not yet been made.

When you create the transfer order for the transfer requirement, the system displays a dialog box with information about the inspection sample quantity calculated by QM. You can decide at this point what to do with the sample quantity in WM.

> The entries required in the dialog box can be preset in *Customizing*. Using an additional switch, you can control whether the dialog box is to be processed in the background or in the foreground with the values from *Customizing*.
>
> If all the required entries exist in Customizing, this makes it possible to process such transfer requirements via direct or automatic transfer order creation.

The following options are available in the dialog box:

a) Sample quantity remains in the goods receipt area

This means that the sample quantity is deducted from the quantity to be placed into stock. Standard stock placement transfer orders are created for the remaining quantity. In the inspection lot, the system records that the inspection sample quantity has been retained at the goods receipt area. In the transfer requirement, this quantity is kept as the open quantity. Further processing of this open transfer requirement quantity is only possible after the usage decision has been made.

b) Transfer inspection sample quantity to the inspection sample storage bin

At this point, you can either enter the storage type and the storage bin manually or you can have these determined by the system based on the defined stock placement strategies. You can overtype the pallet quantities proposed by the system or you can select the option "Round off to full pallets". The system creates a transfer order item for each pallet. When you create the transfer order, the storage bin determined and the transferred quantity are entered into the inspection lot. If the inspection sample quantity is not supplied in full, the dialog box will be displayed again with the next stock placement for this transfer requirement. The storage type and the storage bin can no longer be changed. The remaining quantity is displayed on the screen.

c) Place quantity into storage

This means that the entire transfer requirement quantity is placed into stock. In the inspection lot, the system records that the inspection sample quantity is stored in an unknown storage bin. In the inspection lot, the storage bin entry is deleted.

d) Skip the transfer requirement item

This means that no transfer requirement is created for this transfer requirement item. The data in the inspection lot is not updated. This transfer requirement item remains open and can be processed at a later time.

SAP recommends using option a or b.

If IM postings that relate directly to the inspection sample quantity arise from the usage decision in QM (goods issue to inspection sample or goods issue to returns), these postings take place in WM in the storage bin that is noted in the inspection lot so that no additional transfer order is required for this posting. Any open transfer requirements are canceled. Transferring the quantity to an inspection sample storage bin is appropriate if the sample is damaged during the inspection or if the inspection posting is complete. If the goods receipt quantity is always handled in the same way after the inspection has been closed (for example, release the entire quantity or return the entire quantity to the vendor), then you should decide on option **a** since, in this case, you always have an open transfer requirement that you can use to transfer the inspection sample quantity.

2. The usage decision is already made

The stock placement transfer requirements are processed as if QM did not exist. The transfer requirement does not receive an inspection lot number and no dialog box is displayed.

Making Stock Placements Using the QM Interface

Make sure whenever you have inspection stock (and this stock belongs to different inspection lots) that the quants of these materials do not get mixed up in the storage bins. This can happen especially if you are using stock placement strategy "**I** " (addition to existing stock), "**C**" (open storage) or "**B**" (bulk storage). In the quant, only one inspection lot can be recorded. If the quant amount of a material belongs to different inspection lots, WM can no longer select the correct quants automatically based on a usage decision (for example, returns to vendors).

Examples: Making a Usage Decision

Based on the usage decision in QM, there can be three different action types in WM:

1. Posting changes

> For posting changes from quality inspection to unrestricted-use stock, a posting change notice and 2 interim storage quants are created in WM. When you create a transfer order for this posting change notice, WM automatically selects all quants for this inspection lot no matter where the material is located in the warehouse. If a transfer requirement still exists for this inspection lot, the material data in this transfer requirement is changed in accordance with the posting change notice (in this case the stock category is changed from "Q" to "available"). If you decided to retain the inspection sample in the goods receipt area, this transfer requirement remains open and must still be processed.

2. Picks

> Material is returned to the vendor, or there is a goods issue to scrap or a stock transfer to another storage location. In this case, a negative quant is created in WM in the goods issue interim storage area. If there is still a stock placement transfer requirement for this inspection lot, it is reduced by the stock removal quantity. Depending on the setting in the movement type, the system creates a transfer requirement for the stock removal. An exception to this is when the interim storage bins in the transfer requirement to be created and in the transfer requirement to be canceled are the same. In this case, the system does not create a stock removal transfer requirement.

> In WM there is no stock placement before the usage decision, that is, the complete goods receipt quantity remains in the GR Area (interim storage area for goods receipts) and the stock placement transfer requirement is completely open. The usage decision triggers off the process "Return to vendor". Now, if the movement type of the return delivery is set so that the dynamic coordinate "Purchase order number" is used, the interim storage quant is balanced, the stock placement transfer requirement is canceled, and no new transfer requirement is created. Therefore, if the complete GR quantity is to be returned to the vendor, no further actions in WM are required.

> If the goods receipt quantity is already placed into stock and if it has to be removed again on the basis of the usage decision, the system will only select those quants that belong to the respective inspection lot when the stock removal transfer requirement is being converted into a transfer order. If the system cannot automatically select quants for the required stock removal amount, you can display the material stocks without inspection lots from the stock overview during transfer order creation. For this purpose, choose *Edit → Inspection lot → Ignore* from the stock overview.

Making Stock Placements Using the QM Interface

3.   Direct postings from the inspection sample storage bin

This process is only supported for inspection sample quantities that can be posted from the usage decision for "goods issue to inspection sample" and for "goods issue to returns".

If the inspection sample quantity for each transfer order is reposted during goods receipt to an inspection sample storage bin, the stock in this storage bin is reduced by the two postings directly from the usage decision. No further action in WM is necessary.

If the inspection sample quantity remains in the goods receipt area during the goods receipt process, there is also a stock reduction in this storage bin. Also, the open transfer quantity is reduced by the respective quantity. No further actions are required in WM.

Automatic transfer order processing in the background

As a rule, automatic transfer order creation in the background is possible for all processes directly from the usage decision. This can be set in the movement type in the WM Customizing application.

Automatic transfer order creation is prevented internally by the system if more than one IM posting is created for which a transfer order is to be created automatically. The reason is that in this case the automatic quant determination is not possible during transfer order creation. The postings "GI to inspection sample" and "GI to returns" are exceptions if the respective quantity is in the inspection sample storage bin or still in the goods receipt area.

Table: Clarification of Logic

It is understood that for all the movement types involved, the setting "automatic transfer order creation" is defined.

Total Inspection Lot Quantity: 100 pieces
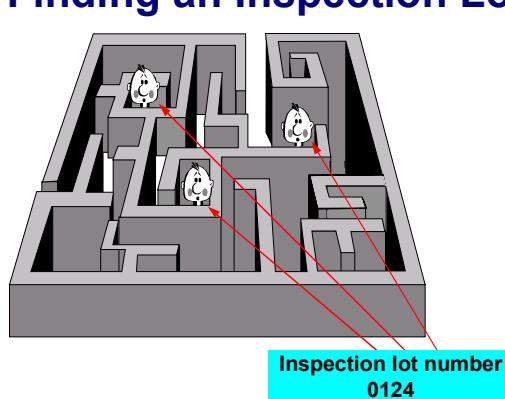
100	PC	to available	automatic TO creation possible

90	PC	to available	automatic TO creation possible
10	PC	to sample	

90	PC	to available	
5	PC	to sample	
5	PC	to returns	automatic TO creation possible

90	PC	to available	

10	PC	Stock Returned to Vendor	automatic TO creation **not** possible
100	PC	to scrap	automatic TO creation possible
10	PC	to scrap	
90	PC	Stock Returned to Vendor	automatic TO creation **not** possible

Finding an Inspection Lot in the Warehouse

To find all materials belonging to an inspection lot in the warehouse, you need to know the inspection lot number. The system enters this number into the WM quant. You can view quant information from any stock display list in WM (see Displaying Quant Information [Page 106]).

After you have noted the inspection lot number

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Bin Stock per Material* from the SAP menu.

2. On the initial screen, enter the warehouse number, material, plant and inspection lot number in the *Inspection lot* field and choose ENTER.

> When processing transfer orders for stock removal, materials are displayed automatically for the corresponding inspection lot in the stock overview. To display **all** stock of the material, including those that do not belong to the inspection lot, choose *Edit → Inspection lot → Ignore* from the transfer order stock overview screen.

Examples for the Putaway of Inspection Stock

The basis for the following examples is a goods receipt for purchase order 1234, material QM1 for a quantity of 100 pieces. The inspection lot quantity is 10 pieces.

Examples

Stock Placement AFTER Usage Decision	
Example 1 [Page 310]	Sample is stored after inspection
Example 2 [Page 311]	Total quantity in inspection lot is returned to vendor
Example 3 [Page 312]	Inspection sample is destroyed

Stock Placement BEFORE Usage Decision	
Example 4 [Page 313]	Sample is stored after inspection
Example 5 [Page 314]	Total quantity in inspection lot is returned to vendor
Example 6 [Page 315]	Inspection sample is destroyed

After Usage Decision: Sample Stored

The stock placement in WM should only take place after the usage decision has been made in QM. The inspection sample quantity is not destroyed during the inspection and placed into stock when the inspection is completed.

SAP recommendation:

1. Post a goods receipt in IM for the purchase order.

    In WM, the stock is posted to an interim storage bin using dynamic coordinates (purchase order number) with a corresponding stock placement transfer requirement. These goods have the stock category "Q" and an inspection lot number.

2. Make a usage decision in QM.

    Release 100 pieces to available stock. When you execute the IM posting, the system creates interim storage quants and a posting change notice in WM.

3. Create a transfer order for the posting change notice in WM

    Here, the stock category is changed from "Q" to "__" (blank) in the stock with the purchase order number as the dynamic coordinates and in the stock placement transfer requirement.

    If you activate automatic transfer order creation for movement type 321, this process will be started in the background directly from the usage decision.

4. Stock placement in WM takes place based on the transfer requirement (the inspection lot number is copied into the quants).

After Usage Decision: Stock Returned to Vendor

This is the same as for Example 1; however, the result of the check is: "Complete stock returned to vendor "

SAP Recommendation:

1. Post a goods receipt for the purchase order.

    In WM, the stock is posted to an interim storage bin using dynamic coordinates (purchase order number) with a corresponding stock placement transfer requirement. These goods have the stock category "Q" and an inspection lot number.

2. Make a usage decision in QM.

    Return 100 pieces to the vendor. When you execute the IM posting, the system creates an interim storage quant and cancels the stock placement transfer requirement.

    Make sure that the WM movement type for the return delivery to the vendor (movement type 102) also executes the posting to the dynamic coordinate for the purchase order number. In this case, the interim storage quants balance out and no further action in WM is required. If the interim storage quants do not balance (for example, for dynamic coordinate of the document number), you must then execute the balance subsequently by means of a manual transfer requirement.

After Usage Decision: Sample Destroyed

The stock placement in WM should only take place after the usage decision in QM has been made. The sample quantity is destroyed during the inspection.

SAP Recommendation:

1. Post a goods receipt for the purchase order.

    In WM, the stock is posted to an interim storage bin using dynamic coordinates (purchase order number) with a corresponding stock placement transfer requirement. These goods have the stock category "Q" and an inspection lot number.

2. Make a usage decision in QM.

    Release 90 pieces to available stock. When you execute the IM posting, the system creates interim storage quants and a posting change in WM.

    Designate 10 pieces as a goods issue to sample. The system reduces the stock placement transfer requirement and the stock in the interim storage bin (dynamic coordinate purchase order number) by 10 pieces.

3. Create a transfer order for the posting change notice in WM.

    Here the stock category is changed form "Q" to "__" (blank) in the stock (90 pieces) in the dynamic coordinate interim storage bin and in transfer requirement for the stock placement.

    If you activate automatic transfer order creation for movement type 321, this process will be started directly in the background from the usage decision.

4. Execute a stock placement in WM on the basis of the transfer requirement (inspection lot number is copied into the quants).

Before Usage Decision: Sample Stored

The stock placement in WM should take place before the usage decision in QM. The inspection sample quantity is not destroyed during the inspection and is placed into stock after the inspection.

SAP Recommendation:

1. Post a goods receipt for the purchase order number.

   In WM, the stock is posted to an interim storage bin using dynamic coordinates (purchase order number) with a corresponding stock placement transfer requirement. These goods have the stock category "Q" and an inspection lot number.

2. Create a transfer order for the transfer requirement in WM

   Here the system displays a dialog box. Now you can decide what is to be done with the sample quantity.

   In the above example, choose the option "Sample quantity remains in GR area". This way a transfer requirement for the inspection sample quantity of 10 pieces remains open. You can use this later for the stock placement of the inspection sample quantity.

   The inspection lot number is copied into the quants; the stock category in these quants remains "Q".

3. Make usage decision in QM

   Release 100 pieces to available stock. When you execute the IM posting, the system creates interim storage quants and a posting change notice in WM.

4. Create a transfer order for the posting change notice in WM.

   Here the stock category is changed from "Q" to "__" (blank) in the quants in the warehouse.

   Also, the stock category for the remaining inspection sample quantity in the GR interim storage area and in the respective stock placement transfer requirement is changed from "Q" to blank.

   If you activate automatic transfer order creation for movement type 321, this process is initiated in the background directly from the usage decision.

5. Stock placement in WM on the basis of the transfer requirement (inspection lot number is copied into the quants).

Before Usage Decision: Stock Returned to Vendor

This is the same as in Example 4; however, the result of the inspection is "Complete quantity returned to vendor ".

SAP Recommendation:

1. Post a goods receipt for the purchase order.

   In WM, the stock is posted to an interim storage bin using dynamic coordinates (purchase order number) with a corresponding stock placement transfer requirement. These goods have the stock category "Q" and an inspection lot number.

2. Create a transfer order for the transfer requirement in WM

   The system displays a dialog box. Here you can decide what is to be done with the inspection sample quantity.

   In the above example, select the option "Inspection sample quantity remains in GR area "; this way, a transfer requirement is open for the inspection sample quantity of 10 pieces. You can use this later for the stock placement of the inspection stock quantity. The system creates a stock placement transfer order for the quantity of 90 pieces.

   The inspection lot number is copied into the quants;, the stock category in these quants remains "Q".

3. Make the usage decision in QM

   Return 100 pieces to the vendor. When you execute the IM posting, the system creates an interim storage quant and cancels the stock placement transfer requirement (10 pieces) for the inspection sample quantity. The system also creates a stock removal transfer requirement for 90 pieces.

   Make sure that the WM movement type for the return delivery to the vendor (movement type 102) is also posted to the dynamic coordinate for the purchase order number so that after the return delivery posting is made there is still a quant with minus 90 pieces available. If the interim storage quants do not balance (for example, in the case of a dynamic coordinate with the purchase order number), you must execute the balance by creating a transfer order manually.

4. Stock placement in WM on the basis of the transfer requirement.

The quants that belong to this inspection lot number are removed from stock via the inspection lot number from the transfer requirement.

Before Usage Decision: Sample Destroyed

The stock placement in WM is to take place before the usage decision in QM is made. The inspection sample quantity is destroyed during the inspection.

SAP Recommendation:

1. Post a goods receipt for the purchase order.

    In WM, the stock is posted to an interim storage bin using dynamic coordinates (purchase order number) with a corresponding stock placement transfer requirement. These goods have the stock category "Q" and an inspection lot number.

2. Create a transfer order for the transfer requirement in WM.

    The system displays a dialog box in which you decide what is to be done with the inspection sample quantity.

    > In the above example, you can use both the option "Sample remains in GR area " as well as the option "Transfer to sample storage bin ".

    A stock placement transfer order for the quantity of 90 pieces is created.

    The inspection lot number is copied into the quants, the stock category in these quants remains unchanged at "Q".

3. Make a usage decision in QM.

    Release 90 pieces to available stock. When you execute the IM posting, the system creates interim storage quants and a posting change notice in WM.

    Designate 10 pieces as a goods issue to inspection sample. The quantity is removed from the storage bin entered in the inspection lot and if a transfer requirement exists, this is canceled.

4. Create a transfer order for the posting change notice in WM.

    The stock category is changed from "Q" to blank in the quants in the warehouse (90 pieces).

    > If you activate automatic transfer order creation for movement type 321, this process is initiated in the background directly from the usage decision.
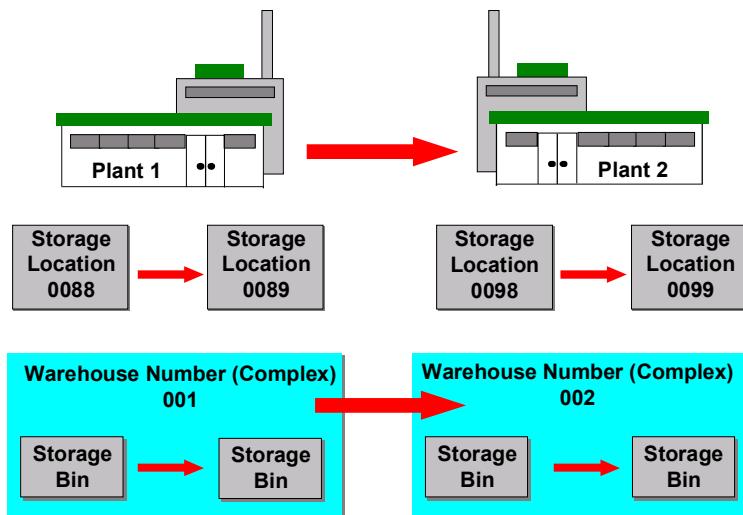
Stock Transfers and Replenishment

Purpose

Stock transfers in the Materials Management system include the physical movement of materials from

- One plant/storage location to another plant/storage location

- Warehouse to warehouse

- Storage bin to storage bin (internal transfers)

This is illustrated in the graphic below.

For stock transfers within the same warehouse complex (that is, within a warehouse number), you can create, manage, and display information about the movement of stock from the time it is received until it leaves the warehouse using the Warehouse Management system (WMS). For stock transfers from one storage location to another storage location, the process begins in the Inventory Management (IM) component and is completed in WMS.

Plant/Storage Location to Plant/Storage Location

Usage

For stock transfer from plant to plant and storage location to storage location, you have three options available:

- Transfers from a WMS storage location to a non-WMS storage location. In WMS, this is processed the same as a goods issue (and subsequent pick).

- Transfers from a non-WMS storage location to a WMS storage location. In WMS, this is processed the same as a goods receipt (and subsequent putaway).

- Transfers from a WMS storage location to another WMS storage location.

    When two different warehouses, for example, are assigned to two separate WMS storage locations, this type of transfer is processed the same as a goods issue (and subsequent pick) in the issuing warehouse and as a goods receipt (and subsequent putaway) in the receiving warehouse.

    If materials are transferred within the same WMS warehouse which is assigned to two separate WMS storage locations, it is handled as a plant to plant posting change. For this type of stock transfer, see Releasing Stock from Inspection [Page 335].

Carrying out the Transfer

Stock transfers that involve the movement of materials from one storage location to another storage location are first processed using the Inventory Management component. In IM, the transfer of stock from one storage location to another storage location is processed as a **transfer posting**. Unlike most such changes, however, no posting change notice appears in the WM system.

Only one storage location can be managed in one warehouse number at a time in WMS. It depends upon which storage location is being managed at the time as to whether a putaway or a pick will take place.

To clear the stock transfer you must create and confirm a new transfer order based on the material document which was originated in IM.

There are two ways to process a stock transfer from one storage location to another storage location:

- You can create a transfer order by selecting from a list of open transfer requirements.

- You can create a transfer order using the material document number (from the IM component) for the stock transfer.

    If you process stock transfers by selecting them from a list of transfer requirements, materials that are being transferred out to another storage location are listed as a pick (movement type 311 in the standard system) to the stock transfer interim storage area (storage type 921 in the standard system).

    When a transfer order has been created from a transfer requirement and confirmed, the negative quant in the stock transfer interim storage area is cleared from WMS.

Plant/Storage Location to Plant/Storage Location

Internal Stock Transfers

Usage

To transfer stock from one storage bin to another storage bin within the same warehouse, you manually create and confirm a transfer order for the material to be moved. Since the total quantity of stock in the warehouse remains the same, stock movements that take place within the same plant and warehouse number do not require the use of the Inventory Management component.

Reasons for Making Internal Transfers

Possible reasons for transferring stock from one storage bin to another within the same warehouse include

- Combining smaller quantities of the same material that are dispersed among several storage bins and moving them into a single bin

- Supplying stock from bulk or rack storage to a picking area

- Clearing bins for technical reasons, for example, to renovate a range of storage bins or for maintenance work

- Transferring stock as soon as a specified capacity has been reached

See also:

Moving Stock from One Storage Bin to Another

Usage

As with all stock movements, to transfer stock from one storage bin to another storage bin within a warehouse number you must first create a transfer order.

To transfer stock of a material from one storage type to another, you can display the bin stock of the source storage type (same as with the bin status report). From this　　display you can select the stock to be transferred and create the respective transfer orders.

Procedure

To manually create a transfer order

1.　Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Block* from the SAP menu.

2.　Enter the warehouse number and storage type. You can limit the entry to a storage bin or range of storage bins.

　　　The system displays a stock list.

3.　From the list displayed, select line items which are not blocked (a lock appears at the beginning of the line) that you want to move to another bin.

4.　To specify the destination storage bin, select *Stock transf.frgrnd* (stock transfer foreground). To allow the system to select a destination bin for you, select *Stock transf.bckgrnd* (stock transfer background).

　　　The system creates a transfer order to move the stock.

5.　Once you have moved the stock to the new bin location, confirm the transfer order to complete the transaction.

Replenishing Fixed Bins in the Warehouse

Usage

The replenishment function is used to fill up the stock in fixed bins. The system first creates transfer requirements for the quantities needed. Afterward, you process the transfer requirements to create transfer orders according to the procedures you would normally use to carry out stock movements in the WM system.

Basically, you have two separate replenishment functions at your disposal.

The first function "Replenishment for Fixed Bins" calculates the replenishment quantities that are required to keep stock at appropriate levels in the warehouse in order to be able to meet the requirements as given by the current stock situation and the entries in the material master.

The second function "Replenishment Planning for Fixed Bins" **plans** the stock replenishment for the fixed bins in that not only the current stock situation is considered, but also future stock picks are taken into account. Here the system includes pending deliveries with fixed bin picking in the calculation process.

Prerequisites

To implement the replenishment task, you must first define a WM movement type for storage types that use the fixed bin putaway strategy. In the standard system, you can use WM movement type 319 (Replenishment to Production) as a copy template.

For more information about movement types, refer to the Implementation Guide (IMG) for Warehouse Management.

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>
> If, in the definition of the movement type, you set the indicator in the *Automatic TO* field, the system will create transfer orders automatically from the transfer requirements. This field is linked to a control table that can be maintained to customize the automatic creation of transfer orders.

In addition to the changes in the Customizing application , you need to also maintain the material master for each material in question. To do so, enter the required data for *Storage bin, max. storage bin quantity, min. storage bin quantity* and *replenishment quantity* at storage type level in der WM view of the material master.

To change a fixed-bin material that has already been created, choose *Master data → Material → Change*.

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>
> If you have not assigne any particular fixed bin to a material, you must first create the fixed bin data for this material in the material master.

Executing Replenishment for Fixed Bins

Usage

You can use this task to control the replenishment of stock for fixed storage bins. Here the sytem automatically calculates the replenishment quantity required to keep the stock in the fixed bins at level that meet the requirements of the current stock situation and the material-dependent settings in the material master.

Activities

Choose: *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Stock Transfer* → *Planning of Replenishments* → *According to Bin Situation* from the SAP menu.

1. Enter the plant, warehouse number, and storage type.

2. In the section *Additional Information for Transfer Requirement,* you can enter the following selection criteria:

    - Requirement number

    - Transfer priority

    - Planning date

    - Planning time

    - Ship-to party

    - Unloading point

Planning Replinshment for Fixed Storage Bins

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Stock Transfer → Planning of Replenishments → Based Upon Outb. Deliveries to be Selected* from the SAP menu.

2. Enter the selection criteria and other appropriate data on the initial screen as follows:

   a) In the *Selection* section:

   - Plant

   - Warehouse number

   - Storage type

   b) In the *Additional information for transfer requirement* section:

   - Requirements type/number

        Depending on how the replenishment movement type was configured for the storage type, a requirement type may be necessary (to identify the reason for the requirement). If a requirement type has been entered, a requirement number must always be entered (to allow transfer requirements to be grouped).

   - Transfer priority

        This value is copied to the replenishment transfer requirement and to the subsequently created transfer order, thus enabling priority transfer orders to be processed.

   - Planned time

   The system proposes the current time. However, you can enter a different time for when the transfer requirement is to be processed. bt Das System schlägt die aktuelle Uhrzeit vor. Sie können jedoch die Zeit eingeben.

3. Execute the report.

Result

The system creates the necessary replenishment transfer requirements and creates statistics containing the following information:

- Number of delivery items and number of materials that were taken into account in planning replenishments for fixed storage bins

- Number of replenishment transfer requirements created and number of items.

Creating a Replenishment TO During TO Confirmation

Use

It is possible to cater for internal warehouse replenishment during transfer order confirmation. In this case, a transfer order is created immediately. This means it is no longer necessary to create a transfer requirement. A verification notice to the creator of the transfer order confirmation is not required, but this is transmitted to the previously defined partner if problems occur.

Prerequisites

In the Implementation Guide under the activity Define Stock Transfer and Replenishment Control [Ext.] (*Logistics Execution → Warehouse Management → Activities → Transfers*), you can decide which replenishment method you wish to use. You can set the replenishment technique in connection with the warehouse number and the storage type. There you can also define which user is to be notified by mail if errors occur.

Features

Determination of replenishment quantities:

Create a minimum quantity and a maximum quantity for the stock in the storage type view. If the stock falls below the minimum quantity, replenishment is initiated.

Immediate TO creation is possible for fixed bins and for random bin management.

1. Immediate TO Creation for Fixed Bins

With this replenishment strategy, the system checks the stock situation in the bin during transfer order confirmation. It uses the quant data and the material master data from the storage type view. A replenishment transfer order determines the fixed storage bin of the material in this storage type as the destination storage bin.

2. Immediate TO Creation Random Bin Management

With this replenishment strategy, the system checks the stock situation of the material in the entire storage type during transfer order confirmation. All the quant data of the material in this storage type and the material master data from the storage type view are used by the system. If the entire stock in this storage type falls below the minimum quantity after transfer confirmation, the system creates a replenishment transfer order. The destination storage bin is determined through the putaway strategy for this storage type. Maintenance of a fixed storage bin is therefore not required in the storage type view of the material master.

As soon as you have defined one of the two replenishment strategies, immediate TO creation takes place during confirmation of the transfer order. If two-step confirmation is active for a transfer order, the replenishment transfer order is created when the picking step is confirmed.

Replenishment reports:

If you have define a new fixed bin, you should use the report RLLNACH1 to create the first replenishment. After you have run the report, picking should only be commenced again in the fixed storage type when the replenishment transfer requirements have been converted into transfer orders. Otherwise it is possible that too much replenishment is requested.

The same applies to the replenishment report RLLNACH4, which you can use for random bin management.

Posting Changes in WM

Purpose

A posting change generally refers to a bookkeeping change - a change in information - about a particular material. For most posting changes, such as changing a batch number or releasing blocked stock, the goods themselves remain in the same physical location.

Reasons for Making Posting Changes

Posting changes are made for several reasons. These include:

- Releasing stock from inspection into available stock

- Converting blocked stock to inspection stock

- Designating available material as inspection stock

- Changing a Material Number

- Splitting available materials into two or more batches

- Converting special stock, such as consignment stock or returned stock, into the company's own stock

- Changing ownership of stock in the same warehouse from one plant to another

Additional reasons for making posting changes are listed in the *MM Inventory Management* documentation (see Transfer Postings and Stock Transfers - General [Ext.]).

Integration

Although you can initiate some material status changes within the Warehouse Management (WM) component, posting changes are generally initiated in the IM application component as transfer postings and then subsequently processed in WM. When you initiate a transfer posting in IM, the system creates a posting change notice in WM. Posting change notices are only relevant for materials tracked within WM that have undergone a change in status. To finalize the process, you create and confirm a transfer order for the posting change notice in WM.

Prerequisites

In WM *Customizing*, you define WM movement types for the individual posting change processes that subsequently determine how the system will process the posting changes. For information about linking IM movement types to WM movement types, refer to Movement Types in WM [Page 144].

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>
> For example, you can configure the system so that the quants of consignment stock are to be converted into one's own stock. Also, you can assign the WM movement type to an IM movement type that determines with which movement type the posting is to be carried out in Inventory Management.

Processing Posting Changes

Purpose

You process posting changes in IM and WM to change the status of a material in the warehouse. How this actually takes place in the system is described below.

Process Flow

1. You generally initiate a posting change in the Inventory Management component by carrying out a transfer posting. You can also start this process from within Warehouse Management (WM) for some posting changes (see below).

2. The system creates a posting change notice in WM.

   Additionally, the system creates two quants of equal negative and positive amounts in the posting change interim storage area – a negative quant for the material to be removed and a positive quant for the material to be added.

3. In WM, you can view the posting changes that were initiated in IM by displaying the **posting change notice list** in WM. When you retrieve this list, you can display all posting change notices that are still open and/or those that are partially or fully cleared.

4. In WM, you process the posting change from the posting change notice list to create a **transfer order**.

   The transfer order contains 2 items for each item in the posting change notice -- one to move the material quant into the interim posting change area and one to move it back out again with the status change.

   💡

   This is a logical step used for tracking data that takes place in the system without any physical movement of stock. In most cases, the material stays in the original storage bin. However, in some instances, you have the option to transfer the material to another bin within the warehouse during this step. (See step 6 in Releasing Stock from Inspection [Page 335].)

5. To complete the change in material status, you confirm the transfer order.

   This clears the posting change area.

Automatic Processing

To create transfer orders automatically for posting change notices, see Automatic/Immediate Transfer Order Creation [Page 161].

Displaying Posting Change Notices

To display posting change notices from the Posting Change Notice List:

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → PostChange → Via Inventory Management → Posting Change Notice → Display → Single Document* or *Logistics → Logistics Execution → Information System → Warehouse → Posting Change Notice → Document Overview* from the SAP menu.

2. As a minimum you must enter your warehouse number. When you display the Posting Change List, all other fields on the initial screen can be used to limit the number of items you will retrieve in the list.

    For example, to display a list of open posting change notices for materials in inspection, mark the *Status open* field and enter **Q** in the *Stock category* field on the initial screen.

3. To display the list of posting change notices, choose ENTER.

    From the list of posting change notices, you can create transfer orders or display further information about the posting change notices.

Automatic Creation of TOs for Posting Change Notices

Use

You can have transfer orders created **automatically** in the background by the system with reference to posting change notices. The transfer orders are created independently of the deliveries.

Prerequisites

You have activated the automatic transfer order creation setting for transfer requirements and posting change notices.

For more information on how to set up automatic transfer order creation for transfer requirements and posting change notices, refer to the IMG for Warehouse Management under the path *Activities → Transfers →* Set up Autom. TO Creation for TR/Posting Change Notices [Ext.].

Features

To activate the automatic creation of transfer orders for these **posting change notices**, you must start the report **RLAUTA11** as a background job. For each occurrence of the indicator *Autom. TO Creation*, you must define a separate variant. This way, different starting times and repetition cycles can be defined for the different indicators. The following options are at your disposal:

- The system creates a transfer order for each posting change notice.

- The system creates transfer orders only for posting change notices that meet certain criteria (for example, date or time). You enter these criteria individually into a user exit.

- With the help of user exit criteria (see step 2) you can set up the system so that it groups transfer requirements under a group number and creates transfer orders for this group.

For information about creating transfer orders based on posting change notices, refer to the section Processing Posting Changes [Page 327].

Processing Posting Changes Entirely Within WM

Purpose

You can process some posting changes for quants entirely within the Warehouse Management component. The system then carries out all necessary processes in the Inventory Management (MM-IM) component.

This processing method is possible for material status changes in both directions between

- Quality inspection, blocked stock and unrestricted-use stock

- Consignment stock and own restricted stock

- Individual customer stock and own stock

- Returnable transport packing and own stock

- Project stock and own stock

> Common situations used to carry out posting changes directly as a one-step process the WM include such activities as
>
> - Changing available stock to blocked stock due to damaged cartons, or
>
> - Converting consignment stock to one's own stock for use in production.
>
> (See Example: Changing the Status of Consignment Stock [Page 331].)

Restrictions

Not all possible posting change variants are supported by this function. For certain posting changes, for example, for active QM material components, you must initiate the posting changes as transfer postings in IM and then process the corresponding posting change notices in WM. In this case, the status change takes place by processing a QM inspection lot.

Features

- If you start this program in the foreground, you can select the quants separately using the corresponding functions for the posting change.

- If you start this program in the background, the system converts all quants that fulfill the corresponding selection conditions in WM and IM. You can also start this report in batch via the control parameter "background."

- You can carry out certain posting changes directly as a one-step process (the posting takes place in WM and IM at the same time) with very little manual entry required.

Errors
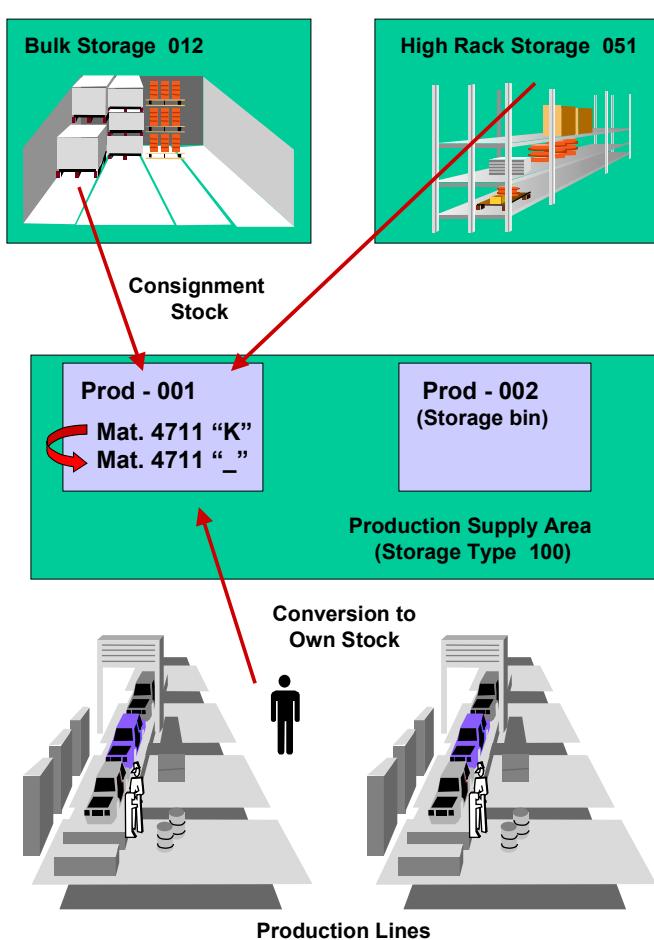
The posting change in the WM and IM components takes place in a logical work unit. In case of an error, any system updates that may have already been carried out are deleted (taken back again).

Example: Changing the Status of Consignment Stock

This section describes an example of the procedure used to process a posting change fully within the WM system (see Processing Posting Changes Entirely Within WM [Page 330]).

The following graphic illustrates the conversion of consignment stock that will be used for production.

Bulk Storage　012

High Rack Storage　051

Consignment Stock

Prod - 001

Mat. 4711 "K"
Mat. 4711 "_"

Prod - 002
(Storage bin)

Production Supply Area
(Storage Type　100)

Conversion to Own Stock

Production Lines

When consignment stock is transferred from the warehouse to a production storage area, it frequently must be converted to one's own stock before it is used on the production line. This type of conversion takes places after needed material components have been moved from storage areas in the warehouse into the production supply areas.

Although many posting changes must be first carried out in IM, you can carry out this type of transaction fully within WM.

The system can be set up so that this transaction takes place **automatically** as a batch process. The manual procedure is described below.

Procedure

1. To initiate the release of stock from inspection in WM, choose *Posting Change → Inventory Management → Posting Change WM and IM* from the WM menu bar.

2. On the initial screen, you need to enter the following data:

- Warehouse number,

- Special stock indicator "K" (Consignment vendor)

- Movement type (for this process)

    If it does not yet exist, you need to create a movement type for this purpose that moves the stock into the interim area for posting changes and back out again.

- Storage type or Material

    You can also enter other available data on this screen as an additional option.

    Choose EXECUTE.

3. Select the materials that you want to convert from list displayed and choose POST CHANGE.

    The system creates and confirms a transfer order that converts the materials from consignment stock to one's own stock in both WM and IM.

    The materials you selected from the list are highlighted in green to verify that the posting change has been carried out. If an error occurs, the system highlights the item(s) in red.

Processing Inspection Stock

The most common type of posting change involves goods received in the warehouse that are posted for inspection. When goods are received into the warehouse, they are frequently held for inspection before they are released as stock available for issue. You use the IM component to assign the stock category Q (quality inspection) to inspection stock. The stock category is not removed until the goods have been inspected and released from quality inspection. Once the release of material from inspection is authorized, you can release all or part of the material for use. The process is as follows:

1. Release the stock from inspection in WM or IM. QM-managed stock can only be released in QM (usually through a usage decision). (See also Releasing Stock from Inspection in IM [Page 205].)

2. Process the resulting posting change notice in WM by creating a transfer order. For this procedure, see Releasing Stock from Inspection [Page 335].

What Happens in the System?

When you create and confirm a transfer order for a posting change notice in WM, the system removes the stock category of **Q** as follows:

The system

a) Posts a negative quantity with a stock category of Q to the warehouse.

b) Posts two quantities to the posting change area:

- a positive quantity with a stock category of Q

- a negative quantity with a blank stock category

c) Posts a positive quantity with a blank stock category to the warehouse.

With these postings, although the stock remains in the same physical location, the system "moves" the **unavailable** inspection material into the "logical" posting change area and then back into the warehouse as **available** material.

To see what happens in the system, display a transfer order that was created for a posting change notice.

Transfer Order Display Screen

Item	Material	Plant	T	Type	Stor.bin	Target quantity	AUN
1	Material 1 **with cat. Q**	0001	S	902	0045002386	100.000	PC
			D	922	PC-AREA	100.000	PC
2	Material 1 **without cat. Q**	0001	S	922	PC-AREA	100.000	PC
			D	902	0045002386	100.000	PC

As shown in the illustration, the first item in the transfer order moves the material from the source storage bin to the posting change area; the second item moves the material back into the source storage bin.

> No physical area needs to exist for this posting change area. This is a **logical** storage type and is known as an **interim storage area** in WM. (See The Storage Type [Page 23].)

When you release materials from inspection, although they remain in the same "physical" location, the materials are moved "logically" to the posting change interim storage area **with** the stock category of Q. When you carry out the posting change in WM and confirm the newly created transfer order, the material is moved back into the same storage bin **without** the stock category of Q.

See also:

Releasing Stock from Inspection [Page 335]

Releasing Inspection Stock from More than One Storage Type [Page 337]

For information about releasing inspection stock from a single storage type, see Goods Receipt for Inspection [Page 202].

Releasing Stock from Inspection

In order to release stock from inspection, you can initiate this action in WM or in IM. For active QM components, you must start this function in Inventory Management. To initiate this action in IM, see Releasing Stock from Inspection in IM [Page 205].

Processing the Posting Change Notice

To process posting change notices in WM to release goods from inspection

1. Choose *Logistics → Logistics Execution → Internal Warehouse Processes → PostChange → via Inventory Management → Transfer Order → Create → From List of Posting Changes* from the SAP menu.

2. On the initial screen, enter **Q** in the *Stock category* field, a movement type (321 in the standard system) and choose ENTER.

3. Select the posting change notice you want to process from the list displayed.

4. To process selected posting change notices, choose *Environment → Create transfer order*.

5. Select the storage types from which materials will be selected for the posting change.

   To display a quant list for the selected storage types, choose *Quant list* (at the bottom of the screen).

   The system displays the *Quant List* screen with two tabs: *Available stock* and *Unavailable for Post.Chge*. (If there are no available quants, the system will only display the Stock Overview screen for the material.)

   Stock that is unavailable for posting changes is listed in the *Unavailable for Post.Chge* tab. In this list, a reason that the status cannot be changed (such as, blocked for inspection) is indicated in one of the columns.

6. In the *Available stock* tab, you enter the quantities for the posting change. You should enter quantities that add up to exactly the same amount as the quantity listed in the *Open quantity* field near the top of the posting change notice. You can also select one or more storage bins and the *Calculate* button at the bottom of the screen to allow the system to enter the correct quantities for you.

   For an individual item, you can process the entire quantity or enter a quantity in the *Selected quantity* column which is less than the quantity shown for an existing quant.

   If you do not want to leave the material in the same bin, deselect the *Post to same bin* column (the system selects this column as a default).

   Normally you can enter any quantity in the *Selected quantity* field. In a bulk storage area that is managed for storage units, if only part of the available quantity in a storage bin is to be processed for a posting change, you must change to the view that displays the stock for each storage unit.

   There are two options:

   a) You can enter the total *Available quantity* in the storage bin as the quantity to be converted (*Selected quantity*).

   b) You can select the bulk storage bin and choose the button *Display bulk storage quants* at the bottom of the screen. The system then displays the stock in the bulk

storage bin for each storage unit separately. In this display view of the bulk storage stock, you can select individual quants and process a posting change for only part of a storage unit.

7. You process the posting change by creating a transfer order.

   Choose *Edit* → *Process in foreground* or *Edit* → *Process in background*.

   For each selected quant the system creates two transfer order items. The first item removes the material to be cleared. This item is always created in the background. The second item replaces the material that was removed.

   If the material is to remain in the same bin, the second item is also created in the background. If the material is to be transferred at the same time, you have the option to create the second item in either the foreground or the background.

   The system selects the *TO item created* column to indicate that a transfer order was created.

8. To complete the process, choose *Posting change* → *Post*.

   The system displays a message that identifies the number of the newly created transfer order.

9. Confirm the transfer order to complete the processing of the posting change notice.

   Once you have confirmed the transfer order, the system clears the posting change area (interim storage area).

Releases from More than One Storage Type

When part of the material in a goods receipt for a purchase order is held in the goods receipt area for inspection while the remainder is placed into another storage type within the warehouse, part or all of the stock in the purchase order may be released after it has been inspected.

When inspection stock is received in the goods receipt area (storage type 902 in the standard system), a stock category of Q is assigned and an open transfer requirement appears in WM. Because of the stock category, none of the materials in either location can be released as available stock until the inspection has been completed.

You have the option of releasing stock from inspection in the Inventory Management component or from within WM. For active QM components, you must start this function in IM.

Procedure in WM

Once the stock has been released from inspection in IM, you use the same steps to complete the posting change in WM as those described in .

The only difference is that when you select quantities in the Quant List, you cannot deselect the *Post in same bin* column for quants that are still in the goods receipt area. This is because an open transfer requirement exists for these quants and they must be left in the same bin.

When you process the posting change, the system updates the corresponding transfer requirement items for the amount in the transfer order. In addition, the system creates a new item in the transfer requirement to place the remaining materials released from inspection into available stock.

Releasing Consignment Stock from Inspection

You have the option of releasing consignment stock from inspection in the Inventory Management component or from within WM. If the consignment stock is QM-managed, it must be released using a QM function.

When consignment stock has been released from inspection in IM, it is displayed on the posting change notice list with a stock category of Q in the *C* (category) column and a special stock indicator of K in the *S* (special stock) column.

Process Flow

The basic steps for processing the release of consignment stock from inspection are described under Processing Posting Changes [Page 327].

For instructions on how to carry out the manual procedure, see Releasing Stock from Inspection [Page 335].

Processing Blocked Stock

Stock designated in IM as blocked stock is displayed in WM with a stock category of "S". For posting changes, you process this stock in WM in the same manner as inspection stock.

You have the option of initiating posting changes to change the status of blocked stock in the Inventory Management component or from within WM.

Process Flow

The basic steps for processing blocked stock are described under Processing Posting Changes [Page 327].

See also:

Releasing Stock from Inspection [Page 335]

Converting Available Stock to Inspection Stock

If warehouse stock has been damaged, for example by water or fire, it can be reassigned as inspection stock.

You have the option of initiating posting changes to convert the status of available stock to inspection stock in the Inventory Management component or from within WM. If the material is QM-managed, you must change the stock to inspection stock using functions in IM and QM.

Process Flow

The basic steps for processing this stock are described under Processing Posting Changes [Page 327].

See also:

Releasing Stock from Inspection [Page 335]

Changing a Material Number

Purpose

You carry out a posting change to change a material number to another existing material number. Such changes most commonly apply to materials in chemical and pharmaceutical firms where the percentage of a substance contained in a solution may vary.

> As an example, a citrus fruit juice manufacturer produces orange juice which normally has a sugar content of 30 per cent. However, after the cartons have been filled and stored it is determined at a later time that, due to varying weather conditions (such as excessive rainfall), the sugar content in the orange juice is only 15 per cent. In this case, a material number change can be carried out so that the stock is properly identified.

Prerequisites
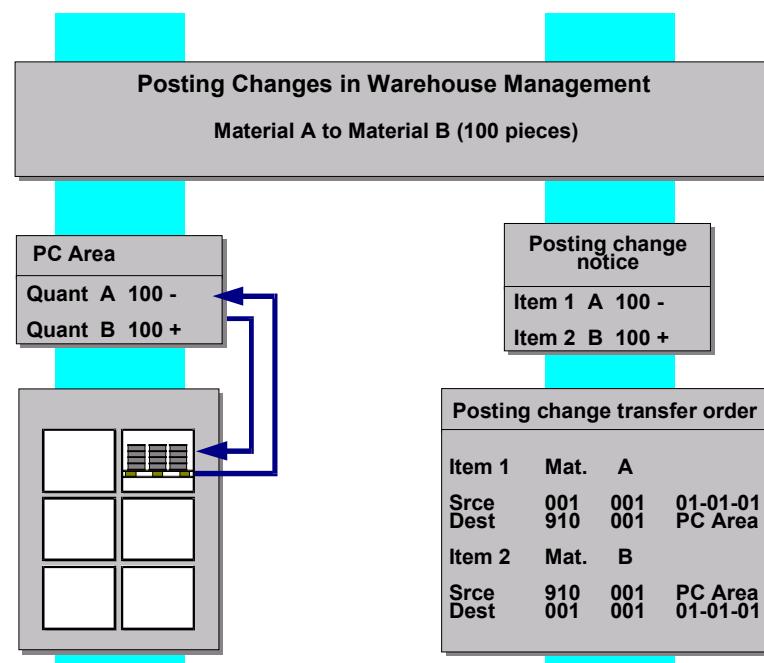
In order to change a material number, the new material must

- Already be available in the system

- Be processed using exactly the same quantity and storage quantity unit as the previous material

Process Flow

The basic steps for this process are described under .

The figure below illustrates how the system processes a posting change notice to change a material number.

1. When you carry out a transfer posting to change a material number in IM, the system creates a posting change notice and two quants - a negative quant for the old material number and a positive quant for the new material number.

2. To clear the posting change notice in WM, you must create and confirm a transfer order based on the open posting change notice.

3. When you create and confirm the transfer order for the posting change notice, you can transfer the stock to another storage bin or leave it in the same bin as shown in the graphic.

How to Change a Material Number

Once you have initiated the posting change in IM by processing a transfer posting, the procedure for changing a material number is basically the same as any other posting change. For an example, see .

> For this procedure, you use movement type 309 in the standard system. On the initial screen, you should enter the current material number (not the new material number) in the *Material* field.

Dividing Materials into Two or More Batches

Dividing a material into two or more batches is similar to changing a material number.

Process Flow

1. First, you initiate a posting change as a transfer posting in IM for "material to material". Instead of changing the material number, however, you add a new batch number for the desired quantity of material.

2. When you post the transfer posting in IM, the system creates a posting change notice in WM.

3. To complete the process, you create a transfer order for the posting change notice in WM.

See also:

Processing Posting Changes [Page 327]

Changing Stock Ownership from Plant to Plant

It is not uncommon for several plants to own stock in the same warehouse. When the ownership of stock in the same warehouse complex is changed from one plant to another, since the stock often remains in the same storage bin, it is considered be a posting change rather than a stock transfer. This ownership change must first be processed as a transfer posting in IM. Afterward, it is cleared in WM by creating and confirming a transfer order. (This type of change can also be processed as a stock transfer in IM using standard movement type 301 even though the stock itself may remain in the same place.)
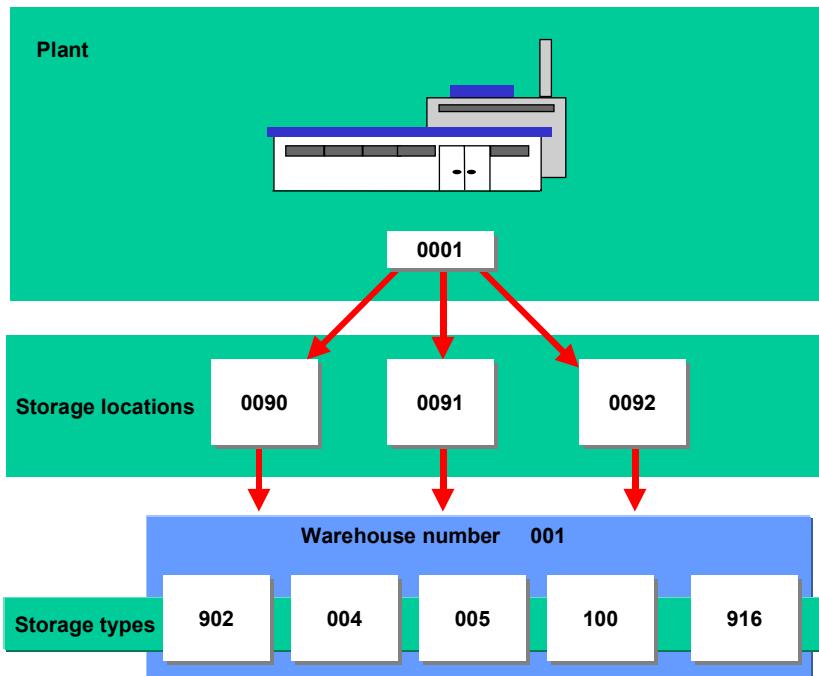
> In order to transfer ownership of stock from one plant to another plant in the Materials Management system, the material master record for the material you want to transfer must be maintained, not only for the plant which currently owns the material, but also for the plant which will take over ownership of the material.

1. When you change stock ownership from one plant to another using IM, the system creates a negative quant and a positive quant in WM in the posting change interim storage area. Also, the system creates a posting change notice for the quantity transferred.

2. Once the ownership of stock has been changed in IM, you process the posting change in WM using the same general procedures described in Releasing Stock from Inspection [Page 335].

> In the standard system, you can use movement type 309 to process this type of posting change.

Storage Locations in TRs, TOs and Posting Changes

Use

If you plan to store and manage the stock of several storage locations in the same warehousing complex, you can assign any number of plant/storage location combinations to the same warehouse number.

Reasons for doing this include:

- Representing the ownership status of more than one company

- Making planning decisions at this level

For more information about the structure of storage location assignment to plants and warehouse numbers, see Overview: The Warehouse Structure in WM [Page 17].

Prerequisites

When you assign several storage locations to a warehouse to display the ownership status of the companies for the goods stored, and the goods movements between storage locations are initiated solely via IM postings, no further Customizing settings are required. You only need to assign the storage locations to the respective warehouse number.

To uniquely identify stock in WM when taking physical inventory, for example, you sometimes need to enter the storage location in addition to the plant.

The system also supports scenarios in which the system manages stock in interim storage areas in different storage locations in a different manner than it manages the stock in the warehouse.

For example, this may occur in an independent storage area in production or when you need to separate stock during when it is received for putaway using special storage locations.

In such scenarios, there are putaway and picking requirements for a storage location for which there is no stock in the warehouse. In this case, you need to determine the storage location to which the stock belongs and then generate posting changes for the respective stock between the different storage locations involved in the IM component.

Such posting changes can either be processed immediately (and automatically) after confirming the transfer orders or they can be processed accumulatively using a batch run of the report RLLQ0100. If an error occurs, you can define a user who will be informed by a mail message. This person can then execute the posting change manually using the transaction LQ01.

To activate these functions, additional settings in Customizing to control storage locations and posting changes are required.

Storage Location Reference

To simplify the control per storage location, you can assign an arbitrary 2-digit selectable storage location reference to the plant/storage location combination. This storage location reference is used in the following two instances:

- To determine the WM movement type

  The storage location reference is a key field used by the system to determine the WM movement type for an IM posting If you have similar goods movements for different storage locations, the system can post these movements to different interim storage areas.

- To determine the storage types

  The storage location reference is a key field in the storage type search table in *Customizing*. This makes it possible for you to control different storage types for both putaways and picks based on the storage location.

Possible Scenarios Based on Storage Locations

The following scenarios based on storage location assignment are provided as examples for implementation in your warehousing complex.

Scenario 1:

One Storage Location per Plant in One Warehouse Number

For this scenario, other than the assignment of the plant/storage location to a warehouse number, there are no additional customizing settings necessary. Within the transactions of WM nothing must be entered into the field Storage Location since the storage location is unique and can always be taken from the values assigned to the warehouse number and the plant.

Scenario 2:
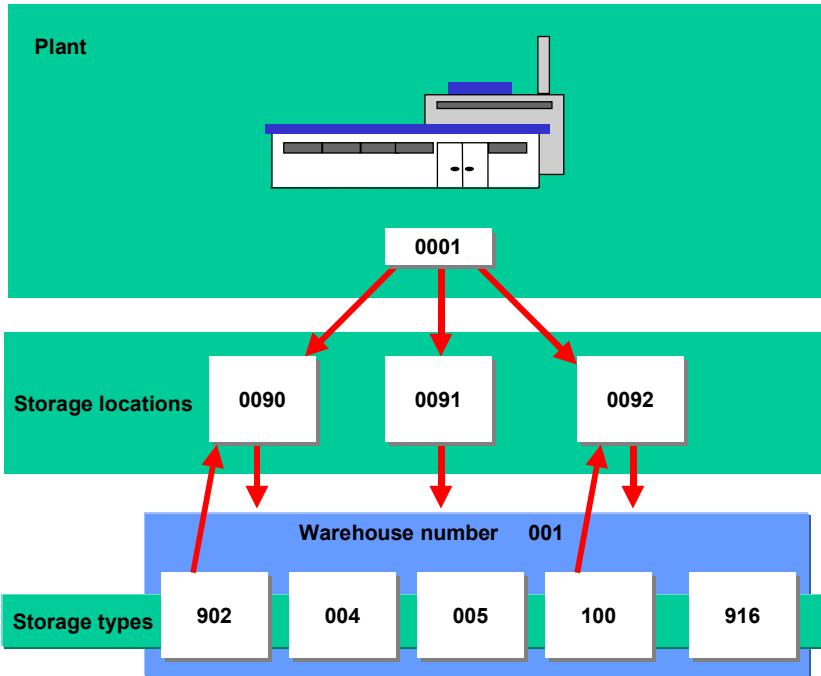
Several Storage Locations per Plant in One Warehouse Number

The storage location displays the actual owner of the stock. Stock movements between the storage locations are always initiated via postings in the Inventory Management component. For this scenario, you need to assign the corresponding plant/storage location combinations to the warehouse number. Additional customizing activities are not necessary.

In this scenario, the system can no longer determine the storage location from the contents of the fields Plant and Warehouse number automatically. When the system creates transfer orders for deliveries or transfer requirements, it copies the storage location from the reference document. When you create transfer orders without a reference document manually, you must enter the storage location in addition to the plant. For inventory taking, this is also necessary for stock that is found in a storage bin that is not in the system.

Scenario 3:

Several Storage Locations per Plant in One Warehouse Number (where the stock is managed differently in interim storage types than in the warehouse itself)

For this scenario, there are two examples:

Example: Stock Movement from GR Area [Page 349]

Example: Material Staging for Production [Page 351]

Example: Stock Movement from GR Area

This example describes a sample scenario in which more than one storage location for a plant are assigned to one warehouse number.

Scenario:

Stock that is located in interim storage areas for goods receipts is managed in plant 0001 storage location 0090. As soon as the goods are moved physically into the warehouse, a posting change converts the stock so that it is in plant 001 storage location 0091.

The reason for this scenario could be to make the goods available for deliveries when the goods receipt processing has been fully carried out. This is possible using this scenario by allowing deliveries to pick stock only from storage location 0091.

Prerequisites

The following Customizing settings are necessary for this scenario:

- Storage location 0090 and 0091 of plant 0001 are assigned to warehouse number 001.

- Storage location 0091 is defined as the standard storage location.

- The indicator for storage location 0090 is set so that it is not be copied into the transfer requirement.

- Settings are made for interim storage type 902 such that the stock of this storage type belongs to plant 0001 storage location 0090 and that the posting change is to take place cumulatively.

These settings will result in the following process for a goods receipt for a purchase order:

1. In the IM component, a goods receipt is posted for purchase order number 45004711 to plant 0001 storage location 0090.

2. As a result, a quant is posted in WM to the interim storage area for goods receipts 902 in storage bin 45004711. The storage location in the quant is 0090.

3. At the same time, the system creates a transfer requirement. Since the indicator is set so that the storage location is **not to be copied** into the transfer requirement, the transfer requirement contains no reference to a storage location.

   For this reason, when the system creates a transfer order for the transfer requirement, the system assigns the standard storage location 0091 to the transfer order.

4. As a result, the transfer order creates a negative quant in the interim storage area for goods receipts 902 in storage bin 45004711 with storage location 0091 and a positive quant in the warehouse also with storage location 0091.

5. After you confirm the transfer order, a posting change (storage location to storage location) must be carried out for the stock in IM.

General information about the posting change:

You set the time for the posting change using the indicator "Combine Posting Changes" under *Interfaces*/*Inventory Management*/*Define storage location control* in *Customizing*. If you set this indicator, the system carries out the posting change using the Report RLLQ0100. You can plan this as a batch job or start it manually using transaction LQ01. If this indicator is not set, the

system carries out the posting change in the background immediately after you confirm the transfer order. For transfer orders that are defined for immediate confirmation, the system carries out the posting change immediately after it creates the transfer order. In both cases, the posting change (transfer posting) takes place in IM with the defined movement type (storage location to storage location).

If an error occurs, and you have defined a mail indicator in *Customizing*, the system sends a message to the user assigned.

In both cases, the system always carries out the posting change for the available quantity of the quant. The system converts quants whose storage location is different from that defined for this storage type in *Customizing* (T320A). The posting change takes place directly in the storage bin 902 45004711. Both of the quants in this location are deleted and the system does not create a posting change notice for this process. A posting change such as this one can only take place in storage types that are defined for a direct posting out of IM. The system checks this for the storage type in *Customizing*.

> This process is intended for available unrestricted use stock. For transfer requirements with the stock category "Q" (inspection stock), "R" (blocked stock returns) and "S" (blocked stock), the system routinely copies the storage location into the transfer requirement. Because of this, the system also creates the transfer order in this storage location and no posting change (transfer posting) takes place in the IM component. For this stock, we recommend that you carry out these posting changes together with other conversions to available stock.

Example: Material Staging for Production

This example describes a sample scenario in which more than one storage location for a plant are assigned to one warehouse number.

Scenario:

Stock that is physically located in production is managed in plant 0001 storage location 0092. Stock located in the warehouse is managed in storage location 0091. As soon as the goods are moved physically to production, a posting change takes place so that they are managed in plant 001 storage location 0092.

For the following example, it is assumed that the WM-PP interface is active and that the stock supplied by WM will be moved to storage type 100 in production.

Prerequisites

The following Customizing settings are necessary for this scenario:

- Storage location 0091 and 0092 of plant 0001 are assigned to warehouse number 001.

- Storage location 0091 is defined as the standard storage location.

- The indicator for storage location 0092 is set so that it is not be copied into the transfer requirement.

- Settings are made for production storage type 100 such that the stock of this storage type belongs to plant 0001 storage location 0092 and that the posting change is to take place cumulatively.

These settings will result in the following process for a the staging of materials for a production order.

1. In the production order component, you enter plant 0001 storage location 0092. The storage location of the production supply area (PSA) is also 0092. Material staging is initiated for production order 10004711.

2. Based on the material staging, the system creates a transfer requirement in WM. Since the indicator is set so that the storage location (0092) is **not to be copied** into the transfer requirement, the transfer requirement contains no reference to a storage location.

   For this reason, when the system creates a transfer order for the transfer requirement, the system assigns the standard storage location 0091 to the transfer order. This means that the system will only select (pick) quants in the warehouse (0091) to be moved to storage type 100.

3. As a result, the system creates a positive quant for the transfer order in storage type 100 with storage location 0091.

4. After you confirm the transfer order, you must carry out a posting change (storage location to storage location) for the stock in IM.

   For this posting change, the system deletes the quant in storage type 100 (storage location 0091) and creates a new quant with storage location 0092.

5. The goods issue posting for the production order (which takes place later) results for storage location 0092 thus reducing the stock in the quant.

For this scenario, you need to ensure that when the production order is released, there is no stock of the material available in storage location 0092. In this case, you should only carry out the capacity check at the plant level.

General information about the posting change:

You set the time for the posting change using the indicator "Combine Posting Changes" under *Interfaces*/*Inventory Management*/*Define storage location control* in *Customizing*. If you set this indicator, the system carries out the posting change using the Report RLLQ0100. You can plan this as a batch job or start it manually using transaction LQ01. If this indicator is not set, the system carries out the posting change in the background immediately after you confirm the transfer order. For transfer orders that are defined for immediate confirmation, the system carries out the posting change immediately after it creates the transfer order. In both cases, the posting change (transfer posting) takes place in IM with the defined movement type (storage location to storage location).

If an error occurs, and you have defined a mail indicator in *Customizing*, the system sends a message to the user assigned.

In both cases, the system always carries out the posting change for the available quantity of the quant. The system converts quants whose storage location is different from that defined for this storage type in *Customizing*. The posting change takes place directly in the storage bin of the quant. Both of the quants in this location are deleted and the system does not create a posting change notice for this process. A posting change such as this one can only take place in storage types that are defined for a direct posting out of IM. The system checks this for the storage type in *Customizing*.

Putaway and Picking Strategies

In the Warehouse Management (WM) application component, you employ putaway and removal strategies used by the system to search for storage bins in the most expeditious manner.

For inbound movements, in conjunction with controls entered in the material master record, the putaway strategies assist the WM system to utilize the available warehouse capacity, automatically assigning optimum locations for goods received in the warehouse.

For outbound movements, the system uses similar user-defined controls to execute the appropriate picking strategy to assign the best picking location. If you decide to manually process certain stock movements, you can change source and destination storage bins that are automatically proposed by the system.

When the system creates transfer orders to move goods into or out of the warehouse, you do not have to intervene when it comes to finding storage bins. This guarantees that stock movements are processed quickly and consistently. If you need to permanently change the characteristics of these strategies, you can do this at any time using the customizing tasks.

Using the Customizing Application

To define the search strategies in WM, you need to use the customizing application to maintain control data in a number of tables. To customize your system, you use the *Warehouse Management Implementation Guide* (IMG).

The activities described in this section are generally carried out by the system administrator. They are included here with references to the appropriate sections in the *Warehouse Management IMG* to provide strategy descriptions and additional information on the corresponding tasks in WM.

Putaway Strategies

Putaway strategies that are used by WM are used to optimize the storage of goods in the warehouse.

Overview of Putaway Strategies in WM
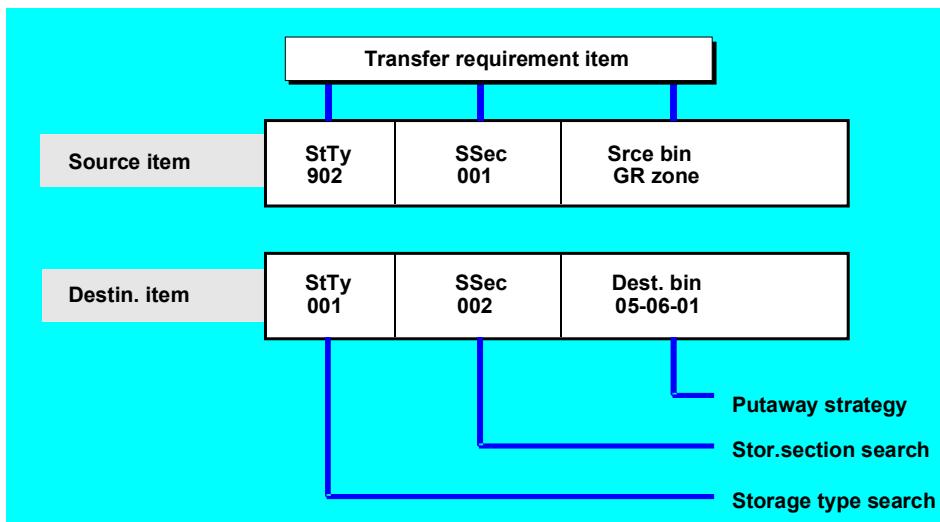
Strategy	The system searches
(Blank)	according to user entry [Page 358]
F	for a fixed storage bin [Page 359]
C	in the open storage section [Page 361]
I	for a storage bin that already contains stock [Page 362]
L	for the next empty storage bin in the storage section [Page 364]
K	near the picking bin [Page 365]
P	according to storage unit type (pallet) [Page 366]
B	in bulk storage [Page 370]
Q	based on a dynamic quant number
(user exit)	customer-defined strategy

To configure WM to use putaway strategies for your warehousing complex, see the corresponding sections under *Strategies* in the *Warehouse Management IMG* documentation.

Putaways

The system gets the information for the source and destination storage bins for a transfer into the warehouse as illustrated below.

Putaway Strategies

Information About Putaways

When stock is put away in the warehouse, it generally is transferred from the interim storage area for goods receipts. Information about the source (interim storage type, interim storage section, and interim storage bin) is recorded in the transfer requirement or the system determines it from the WM movement type.

Storage Type Search

The system must now determine in which storage type the material should be put away. You define this information in the storage type search table. To make entries in this table, see the section on defining the storage type search sequence under *Strategies* in the *Warehouse Management IMG* documentation.

In the storage type search table, you can define a search sequence with up to ten storage types. (Make sure that you enter an **E** for putaway in the column *Activity*). This means that the system uses the search sequence for searching for a destination storage type. The storage type list is set up in a hierarchical form, that is, the system first searches for empty bins in the first storage type, then in the second storage type, and so on. The table entries that the system uses for this search depend on the movement type and/or the material being put away.

You can also group materials together by the storage type indicator so that the system uses the same search sequence and stores the group of materials in the same storage type or types. To implement this you define a:

- Storage type indicator in the material master record (the *Putaway* field)

- Storage type indicator in the storage type search table (in the *TyInd* field)

Reference to Movement Type

Entries in the *Ref* column of the storage type search table influence storage type search according to movement type. To link specific movement types to reference column entries in the storage type search table, see the section on *Defining movement type references* under *Strategies → Activate storage type search* in the *Warehouse Management IMG*.

To link a movement type to a storage type search sequence, you enter a reference number in the *Reference Type Search* column of the table displayed. This same number will also appear in the *Reference storage type search* field for each movement type selected.

Access Optimization for Storage Type Search Strategies

When storage type indicators are used and several materials with different stock categories (such as special stock) exist, the number of entries in the storage type search table can become very large. To decrease the number of these entries, you can define an access strategy for the storage type search table using the access strategy table.

To define access strategies for the storage type search table, choose *Access Optimization for Storage Type Search* from the list of objects under *Strategies → Storage type search* in the *Warehouse Management Implementation Guide (IMG)*. For instructions on how to use this table, select online help for any of the fields displayed.

Hazardous Materials

You can also influence storage type search according to hazardous material storage classes and water pollution classes. For more information about this topic, see Stock Transfers and Replenishment [Page 316].

Storage Bin Search

Once the storage type has been determined, the system then searches within the storage type to find an appropriate storage bin in which the material can be put away. To find a storage bin, the system uses a search strategy that has been defined for the storage type. For each storage type you can define a putaway strategy.

Regardless of the putaway strategy, there are two other factors that affect how the system searches for empty storage bins:

- The storage section

- The storage bin type

Both of these factors are independent of the strategy that is used for stock putaway. Both can be used with all putaway strategies with the exception of fixed bin strategy, for which storage sections cannot be used.

Storage Section Search

You can divide a storage type into several storage sections (see The Storage Section [Page 26]) in which various materials can be stored. You can use these storage sections, for example, to ensure that frequently used materials ("fast-moving" items) are stored in the front of the warehouse while seldom used materials ("slow-moving" items) are stored in the back of the warehouse. A storage type is divided into storage sections on the basis of storage bins. When you create a storage bin, you assign it to a storage section.

To set up the strategy for storage sections, see the section on activating storage section searches under *Strategies* in the *Warehouse Management IMG* documentation.

If storage section checking is active for the storage type, then the system searches in the storage type only for those empty storage bins in storage sections that have been allowed for the material being put away. When you are creating a transfer order and manually enter a storage bin, then the system checks whether the bin is in a storage section that is allowed for the material. You can also make an entry in customizing that permits you to override the section check for manual entries.

Putaway Strategies

Storage Bin Type Search

In one storage type you may have storage bins of different sizes. The system then searches for a suitable bin that will accommodate a specific storage unit type for putaway. When you create a storage bin, you assign it to a storage bin type.

To set up the strategy for storage bin types, see the section *Activating Storage Bin Type Search* under *Strategies* in the *Warehouse Management IMG* documentation. In the table for assigning storage unit types to storage types, you can define up to ten storage unit types that can be accommodated in each storage type.

See also

Optional Storage Unit Type Check When Creating a Transfer Order [Page 369].

Next you must assign the storage bin type to each storage unit type. In the storage bin type search table, you can define up to ten storage bin types that can be used for each storage unit type in a storage type.

As a final step, you must activate the storage unit type checking for a storage type.

The connection between a material and storage unit type checking is made in the material master record. (See Material Master Data [Page 98]) You can define up to three different palletization suggestions (storage unit type and number of units of material per storage unit type) for a material.

If storage unit type checking is active for the storage type, the system first determines if the storage unit type for the material can be put away in the storage type. Next the system searches for an empty storage bin in the first storage bin type that can accommodate the storage unit type. If the system does not find a suitable storage bin, it then looks in the second storage bin type, and so on. When you are creating a transfer order and manually enter a storage bin, then the system checks whether the bin belongs to one of the allowed storage bin types.

Customer-Defined Strategies

To use customer-defined strategies, you must select the *User exit active* field in the *Putaway Control* section of the appropriate storage type record. For instructions, see the section on *Developing function extensions* in the *Warehouse Management IMG* documentation.

Strategy Used for Storage Unit Management

Strategy Q is used in warehouses that are managed for storage units. For information about the use of this strategy, see Identification Points [Page 419].

See also

Additional Factors that Affect Search Strategies [Page 380]

Manual Entry

Use

The system does not use a strategy to search for a storage bin. The user enters the destination storage bin when the transfer order is created. This procedure is used if the search for a storage bin is done on-site by the warehouse worker. First the warehouse worker searches for the appropriate storage bin. Then the data about the storage bin (for example, storage type and coordinates) is entered into the transfer order.

We recommend that you use "manual entry" for mixed storage and interim storage types.

Prerequisites

Since no strategy is used, you leave the *Putaway strategy* field **blank** in the storage type record.
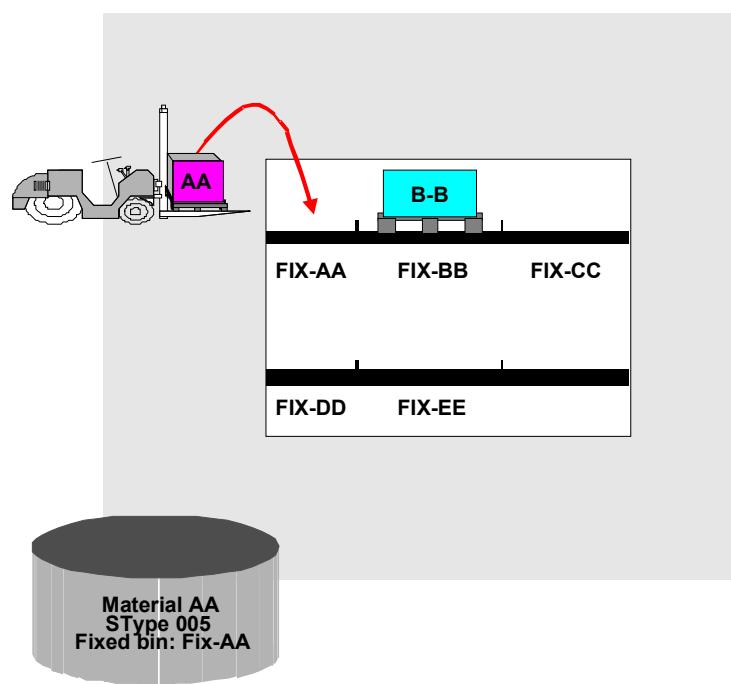
Strategy F: Fixed Bin Storage

Use

This putaway strategy is used when a material is to be stored in a fixed bin in a storage type. This strategy is used primarily in storage types from which picking is done manually. You define the fixed bin in the material master record (the warehouse view).

The following figure is an example of the fixed bin strategy.

Prerequisites

When you define the storage type record to use this strategy,

- Enter **f** in the *Putaway strategy* field.

- Enter **x** in the *Addition to stock* field to allow for addition to existing stock.

- Enter a numeric code for the type of checking in the *Capacity check method* field to activate capacity checking.

If you try to transfer a material without a fixed storage bin into a storage type that has a fixed bin strategy, the system issues an error message. Therefore when you create the warehouse data view for the material master record, you must enter a fixed bin storage type in the organization level window. When you enter the storage type at this level, the system displays data fields specifically for the storage bin on the WM data entry screen. Be sure to enter a fixed storage bin in the *Storage bin* field.

See also:

Strategy C: Open Storage

Use

The system uses this putaway strategy to find the storage bin in an open storage section. Open storage is a type of warehouse organization in which you define a single storage bin for a storage section. The quants in the storage bin can also be in the form of mixed storage.

The following figure illustrates open storage.

Prerequisites

When you define the storage type record to use this strategy

- Enter **c** in the *Putaway strategy* field.

- Enter **x** in the *Mixed storage* field.

For each storage type you can define one or more open storage sections. Then for each open storage section you define a single storage bin.
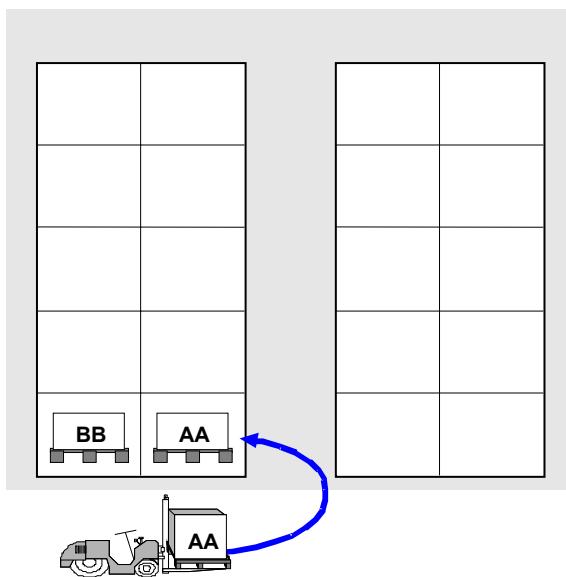
Strategy I: Addition to Existing Stock

Use

When addition to existing stock has been defined as a putaway strategy for a storage type, the system places goods in storage bins that already contain the same material. With this strategy, the system searches for a storage bin in which the material is already being stored. A prerequisite for addition to existing stock is that sufficient capacity still exists in the respective storage bin. If the system cannot find a storage bin with the same material or the capacity of the storage bin will not allow additional quants to be stored, the system switches to the "next empty bin" strategy, that is, it searches for the next available empty storage bin.

The FIFO principle is violated with this strategy; therefore, you should use this strategy when warehouse space is limited.

The strategy for adding to existing stock is illustrated below.

Prerequisites

There are two ways to define addition to existing stock.

- You use the "addition to existing stock" placement strategy for the storage type.

- Set the additional stock indicator (*Addn to Stock*) in the storage type record itself. To change the storage type, see the appropriate section on defining a storage type under *Master data* in the *Warehouse Management IMG* documentation.

When you define the storage type record to use this strategy

1. Enter **i** in the *Putaway strategy* field.

2. Enter **x** or **m** in the *Addition to stock* field to allow for addition to existing stock.

    You set the indicator in the storage type record with an

Strategy I: Addition to Existing Stock

- −   **x**   if you want addition to existing stock generally allowed

- −   **m**   if you want addition to stock based on the indicator in the material master record.

  If you enter **m** then you must set the addition to stock indicator in the material master record. You can set the indicator with an **x** if addition to existing stock is allowed. If you leave the indicator blank, then additional stock is not allowed for the material.

3. Enter a numeric code for the type of checking in the *Capacity check method* field to activate capacity checking.

4. Leave the *Mixed storage* field blank. Mixed storage is not allowed.

Strategy L: Next Empty Storage Bin

Use

For this putaway strategy, the system proposes the next empty bin. Randomly organized warehouses are supported with this strategy, whereby materials are stored in separate storage sections. This strategy is especially suited for high rack storage and shelf storage.

Prerequisites

When you define the storage type record to use this strategy, enter **L** in the *Putaway strategy* field.

The sort order of the storage bins, which influences how the next empty storage bin is found, can be changed.

See also:

Cross-Line Stock Placement [Page 381].

Strategy K: Putaway near Picking Bin

Use

This putaway strategy is used when a material is to be placed in a reserve storage area. The system does not search to see whether a fixed storage bin is available. You can configure the system so that fixed bin assignment is carried out first and if no empty bin is found, the system then uses the strategy to search for a reserve storage area that is as close as possible to the fixed storage area of the material. This strategy can also be used on its own.

The system first attempts to find a reserve storage area in the stack where the fixed storage bin is located, whereby it starts from the lowest level and works its way up. If no empty storage bin is found, it searches to the right of the fixed bin and then to the left in the same aisle and then in the adjoining aisles. It always searches from bottom to top.

Setting up the Strategy

When you define the storage type record to use this strategy, enter **K** in the *Putaway strategy* field.

Strategy P: Storage Unit Type

Use

Using this putaway strategy, the system processes different storage unit types (for example, pallets) and allocates them to the appropriate section. Often, one storage bin is divided into several smaller sections. Typically, only the same storage unit types can be placed into a storage bin at one time.
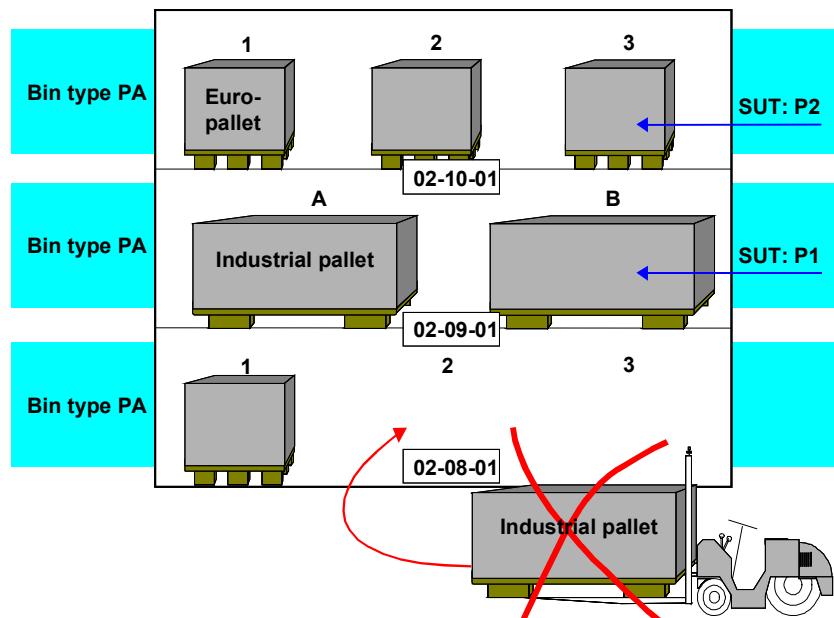
Explanation of the Strategy

High rack storage is frequently designed so that a storage bin can accommodate several different storage unit types.

For example a storage bin can accommodate a number of pallets depending on the size of the pallet, such as three standard pallets (80 x 120) or two industrial pallets (100 x 120). A storage bin may be able to accommodate a single oversized pallet or several very narrow pallets.

Putaway by storage unit type is illustrated below.

For this strategy, you define the maximum number of quants for each combination of storage bin type and storage unit type. The first time goods are transferred into the storage bin, the system determines what type of bin sectioning is assigned to the storage bin. The system also determines which and how many storage units can be transferred into the storage bins.

Prerequisites

When you define the storage type record to use this strategy

1. Enter **p** in the *Putaway strategy* field.

Strategy P: Storage Unit Type

2. Select the *SUT check active* field to activate checking of the storage unit type.

3. Enter **x** in the *Mixed storage* field. Mixed storage is allowed.

> Without Storage Unit Management only one quant exists for each item. When SU-Management is active, only one storage unit (SU) exists for each item. With indicator **a** (in the *Mixed storage* field) the SU has only one quant. With indicator **x** the SU can have more than one quant.

Defining Bin Sections

The table below defines the number of sections the storage bin can be divided into. That is, it controls the number of quants that can occupy a storage bin.

Define Bin Sections

WhN	Typ	SecKey	No.Secs	1	2	3	4	5	6	.... (Sections)
001	007	A	2	A	B					
001	007	B	3	1	2	3				

Section Key

The section key decides which storage unit types and how many storage units of each type can be put into a bin. The sectioning is determined dynamically in the storage bin by the first storage unit placed in the bin. The sectioning is deleted as soon as the last storage unit has been removed from the bin.

Position Identification Codes

To identify each section of a storage bin you enter a one- or two-character code (for example A1, BB, 12) in one of the columns numbered from *1* to *99* under the heading *Sections*. In the *Number of Sections* field the system displays the total number of sections that you have defined.

This code is appended to the storage bin coordinate and separated from it by a slash (*I*).

> For example, using the sections defined for warehouse 001 and storage type 007 (illustrated in the following table) and assuming the storage bin has the coordinate 02-10-01, the three sections of the bin are identified as follows:
>
> 02-10-01/1   02-10-01/2   02-10-01/3

> Once you have defined all the storage bin sections that are required for the storage type, these values cannot be changed.

Assignment of storage bins and storage unit types

For each storage type, you assign the appropriate bin sectioning to each allowed combination of storage bin type (the *Bin Type* field) and storage unit type (the *SUT* field).

Assign Bin and Storage Unit Types

WhNo.	Typ	BinTy	SUT	SecKey	No.Secs
001	007	PA	E1	B	3
001	007	PA	IP	A	2

> ⚠️
>
> **Important:** When you create the storage bins for the storage type that uses this strategy, you must enter a **storage bin type**. This storage bin type must match the bin type in the bin and storage unit type assignment table (above).
>
> Once these assignments have been made they cannot be changed.

See The Storage Bin [Page 29] for information about creating and maintaining storage bins.

If you transfer goods into the storage type for which bin sectioning has been defined, you must enter the storage unit type in the preparation screen of the transfer order. Based on the storage unit type you enter, the system searches for suitable empty storage bins. The system ensures that only a single type of storage unit is stored in a storage bin at the same time.

Additional Option

If you assign the same bin type and a different storage unit type to the same **section key**, is also possible for you to putaway more than one type of pallet into the same storage bin.

Assign Bin and Storage Unit Types

WhNo.	Typ	BinTy	SUT	SecKey	No.Secs
001	007	**PA**	**E1**	**B**	**3**
001	007	PA	IP	A	2
001	007	PA	E2	A	2

> If you set up the table as shown above, you can place an industrial pallet (IP) into the first section of a storage bin and an E2 storage unit type into the second section of the storage bin.

Example: Optional SUT Check When Creating a TO

The system can only find the appropriate storage bins for a storage unit type (SUT) when creating transfer orders if the SUT check is activated. There is a restriction of 10 allowed SUTs per storage type.

You can enter *** as an allowed SUT in this table. This entry means that all the SUTs in this storage type are allowed. The system then searches for a suitable storage bin for the SUT based on the allowed bin types per SUT.

> Before implementing this optional SUT check, you should examine the table parameters closely since problems with performance can arise if the configuration settings are not optimal.

The following example outlines the performance problems associated with the optional storage unit type check and their solutions:

- For SUT E1, bin types P1 P2 P3 P4 P5 are allowed. They are to be stored in storage type 001. However, only storage bins of the type P0 exist here.

- SUT type E1 would not normally be allowed in storage type 001. An efficient system recognizes this (in that it can access a completely buffered table) and continues the search for a place in the next storage type.

- During the optional SUT check, the database is accessed 5 times unsuccessfully. This number increases correspondingly if you work with different storage sections.

It is relatively simple for you to check the customizing settings by viewing the log for the storage bin search. The more unsuccessful attempts made, the more ineffective the process becomes. The number of attempts must be reduced by optimizing the storage type search.

Strategy B: Bulk Storage
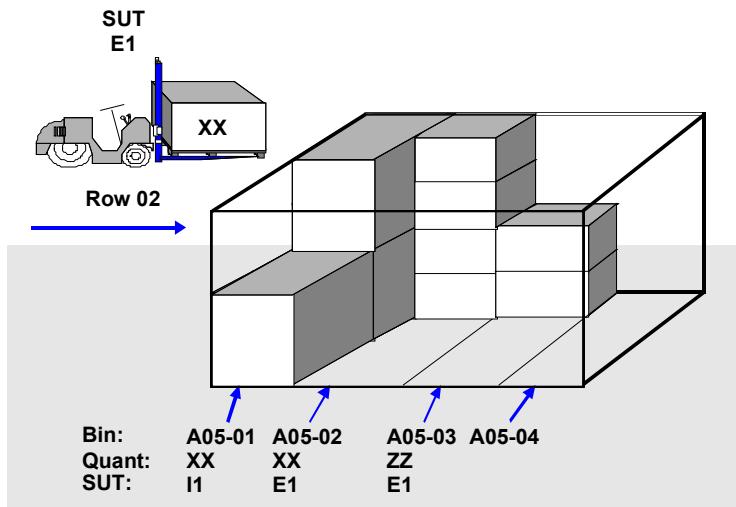
Materials that occur in large quantities and generally take up a lot of space in storage (for example tires, glass products and beverages) are often stored in bulk storage. The advantages of bulk storage include:

- Reduced need for physical storage bins

- Fast access to the trading units

- Clear structuring of the warehouse (into blocks and rows)

This putaway strategy searches for storage bins in bulk storage.

Use

The figure below illustrates bulk storage in WMS.

Bin:	A05-01	A05-02	A05-03	A05-04
Quant:	XX	XX	ZZ	
SUT:	I1	E1	E1	

The most important features of bulk storage processing include:

- **Freely-defined coordinate structure**

  When you define the storage bins in bulk storage, you do not have to adhere to the technical requirements of the system. The warehouse is divided into blocks, which in turn are divided into individual rows.

- **One storage bin per row**

  In practice, a row is treated as the control unit in bulk storage. In WMS a row is created and managed as a storage bin. The storage bins (rows) are classified according to storage bin types.

  For example, rows 2 and 3 in block A05 (illustrated in the above figure) can hold up to 16 pallets. However the 4th row can hold a maximum of 12 pallets, due to the location of a structural column in the row. You can record this fact (reduction in the capacity of a row) in WMS when you define the block structure (see step 4 in "Setting up the Strategy" below).

Strategy B: Bulk Storage

- **Different storage unit types**

  Bulk storage is often used to manage different types of storage units with different dimensions, for example standard pallets and industrial pallets with clip-on mounts. WMS supports the management of different storage unit types in bulk storage.

- **Mixed storage**

  Storage units for different materials are generally not stored in the same row. However, in WMS, all combinations of mixed storage are allowed in bulk storage. You can also require that the material in the storage bin must be from the same batch.

- **Different storage unit types per material**

  Within bulk storage you can store a specific material in a maximum of three different storage unit types. In the material master record you can define storage unit types and the number of quantity units, such as bottles or liters, per storage unit type for each material.

- **Automatic blocking per row**

  To optimize the transfer of goods into and from the storage bins in bulk storage, you can set a blocking indicator for each row separately.

Prerequisites

When you define the storage type record to use this strategy

1. Enter **b** in the *Putaway strategy* field.

2. Enter **x** in the *Addition to stock* field to allow for addition to existing stock.

3. Leave the *Capacity check method* and *SUT check active* fields blank. Capacity checking and storage unit type (SUT) checking are not necessary in bulk storage since an internal check is carried out based on the block structure definition.

4. Enter the appropriate indicator in the *Mixed storage* field. For a description of the different variations that are allowed, see the F1 help information in the storage type record.

When defining the storage type control for this strategy, there are several indicators that you must take into consideration to control the movement of goods into bulk storage. These include:

- Combined Putaway [Page 373]

- Partial Quantities [Page 374]

- Block Transfer into the Row [Page 375]

- Time Limit for Blocking [Page 376]

- Total [Page 377]

- Round Off [Page 378]

See also:

Overview: Picking Strategies [Page 389]

Definition of Bulk storage Indicators

For this strategy, you can define bulk storage indicators together with a descriptive text. Using the bulk storage indicator, you can specify how a particular material is to be stored in bulk

storage. To do this, you enter the bulk storage indicator into the material master record and again into the bulk storage sectioning table when defining the structure of a block.

Structure Definition

You can also define storage bin types and storage unit types as well as other characteristics of bulk storage, such as the maximum number of stacks and the stacking height.

When you define storage bins for bulk storage you are required to enter a storage bin type. See The Storage Bin [Page 29] for information about creating and maintaining storage bins.

Miscellaneous Control Options

In the material master record (the warehouse data view), you can

- Define up to three storage unit types

- Set the bulk storage indicator

- Set the indicator allowing addition to existing stock

See also:

Blocking in Bulk storage

Combined Placement

Field in bulk storage putaway definition.

For putaways the system generates a transfer order item for each storage unit type. For an **uncombined** putaway, each transfer order item is saved individually in the data base. For a **combined** putaway, all transfer order items with the same storage bin are collected and saved as a single item in the data base.

The advantage of combined putaway is the reduction in the number of transfer order items. However, the system prints the transfer order as a single item. Furthermore, you cannot confirm the transfer order on the basis of the storage unit type. You can confirm only on the basis of the storage bin in which items for a specific storage unit type have been collected.

If you want to carry out **combined** transfers to the storage bin in a form, select the *Comb.Plcmt* column.

Partial Quantities

Field in bulk storage putaway strategy definition.

To allow the transfer of partial quantities, such as a partial pallet, into a storage bin (a row in bulk storage), select the *Part* column. After the partial quantity is transferred into the row, the system calculates the percentage of the quantity on the pallet and records this percentage in the quant.

Blocking Transfers into a Row

Field in bulk storage putaway strategy definition.

If you set the *Blocked* field, the system automatically blocks the row (storage bin) when the first transfer is made from the row. This means that the row can be used only to issue goods. As long as the block is set, goods cannot be transferred into the row. The row stays blocked until it is empty. If you run out of storage space, you can cancel the block by:

- Deselecting the *Blocked* column, so that no other block can be set

- Deselecting the *Placement block* field in the blocking indicator section of the storage bin record, so that the blocked bin becomes unblocked

Defining Time Limits for Block

Use

In the bulk storage area, the date of the first putaway in the row is used as the goods receipt date of all subsequent putaways to this row. Therefore, it is a good idea to stop further putaways to the row after a certain number of days so that the FIFO principle is not violated.

You can define a time limit by specifying the number of days after the first putaway in a row (that is, in the storage bin) when a putaway block should be set automatically.

Procedure

The time limit block must be set manually. For this purpose, choose the following path from the SAP *Easy Access* menu: *Logistics → Logistics Execution → Master Data → Storage Bin → Block → In Bulk Storage*.

To remove the block, that is, to unblock the blocked bins, choose *Master Data → Storage Bin → Block → Selectively*.

Example

For example, storage bin A05-01 in bulk storage has a time block of five days. After the first putaway (January 1, 2000), the storage bin is blocked five days later for further putaways. All pallets have the same goods receipt date, although they were put away on different dates, as shown in the following table:

Time Limit for Putaway Block

Putaway Date		Goods Receipt Date
1. 1st January 2000	1. 1st pallet	1. 1st January 2000
2. 2nd January 2000	2. 2nd pallet	1. 1st January 2000
2. 2nd January 2000	3. 3rd pallet	1. 1st January 2000
2. 2nd January 2000	4. 4th pallet	1. 1st January 2000
6. 6th January 2000	5. 5th pallet	1. 1st January 2000
6. 6th January 2000	6. 6th pallet	1. 1st January 2000
7. 7th January 2000	→ Putaway block for row	

Total

Field in bulk storage putaway strategy definition.

This is used to keep track of the total quant count when storage unit management is active in WM. Detailed information about the total quant count is provided in the sections on *Storage Unit Management* under System Controls [Page 436] and Partial Storage Unit Processing [Page 442].

Round Off

Field in bulk storage putaway strategy definition.

When you select the *RoundOff* data column, the system optimizes the removal of partial storage units.

The primary prerequisite is that you have defined the picking procedure in such a way that the system first selects a storage type for picking which is managed for large/small quantities and, afterwards, selects the bulk storage area. As a result, the system searches for a particular material first in a picking area (large/small strategy) and then in bulk storage.

Example: Optimization in Bulk Storage [Page 444]

Strategy Q: Dynamic Quant Number

Use

This putaway strategy allows you to better utilize warehouse capacity. You can use a dynamic storage bin coordinate to temporarily store the material that is to be put away in another location (such as the identification point, or ID point) if the putaway is going to take a long time.

Prerequisites

You can set up this strategy in Customizing for Warehouse Management by selecting *Master Data* → Define Storage Type [Ext.] and entering **Q** in the *Putaway strategy* field.

Features

By implementing this putaway strategy, you prevent the system from blocking the final storage bin during goods receipt for an extended length of time (until the goods arrive there). Instead, the system first creates a dynamic storage bin with the material's quant number as the coordinate.

The system does not determine the final storage bin until you create the quant number of the goods that are to be put away at the ID point, effectively triggering the putaway to the final storage bin.

This putaway strategy is especially useful for an ID point or pick point when the putaway process takes a long time.

Additional Factors that Affect Search Strategies

There are several ways that the putaway and picking strategies can be influenced, for example by:

- Storage types

- Storage sections

- Storage bin type

- Cross-line stock putaway

- Capacity check

You create and maintain these objects using the Customizing application. For more information, see the *Strategies* section of the Warehouse Management section in the Implementation Guide (IMG). For each of the first three options, the system lists additional objects that you need to maintain and the order in which they should be maintained.

See also:

Cross-Line Stock Putaway [Page 381]

Capacity Checking [Page 384]

Cross-Line Stock Putaway

Use

In this function, a sort variable helps the system to search for suitable storage bins. With the sort variable, you can eliminate the problems caused by one-sided loading in the warehouse and optimize the stock putaway process in your warehouse. If the sort variable has not been defined, the system sorts using the storage bin coordinate itself.

Integration

With the putaway strategies L (next storage bin) and P (storage unit type), you can influence the search for a suitable storage bin with the help of a sort variable. This method can also be set up for storage types with putaway strategies L (Addition to existing stock) or B (Bulk storage), since if the system does not find a bin for adding to existing stock, it will use sort variables to find an empty storage bin.

Prerequisites

You define the sort variable for cross-line stock putaway in Customizing for *Warehouse Management*. For further information, refer to the Implementation Guide (IMG) for *Warehouse Management* under the section *Strategies*.

For each storage type, you can use up to six fields of the storage bin coordinate to define the sort variable. You determine which positions of the coordinate are relevant for the variable structure and in which sequence the individual positions are used in the variable.

For example, storage type 001 has

- Coordinate positions   1 2 3 4 5 6 7 8 9 10

- Coordinate structure   R R - S S - L L *

- Variable structure   S S - L L

* R = row   **S** = stack   **L** = level

The fourth and fifth positions of the coordinate, which represent the two digits of the stack, make up the first two positions of the variable. The seventh and eighth positions of the coordinate, which represent the two digits of the level, make up the last two positions of the variable. To define the sort variable, enter the numbers 1, 2, 3, 4, and 5, as shown below, in the data entry table. Start at the fourth position.

Positions in bin coordinate ------

WNr	Type	1	2	3	4	5	6	7	8	9	10
001	001				1	2	3	4	5		
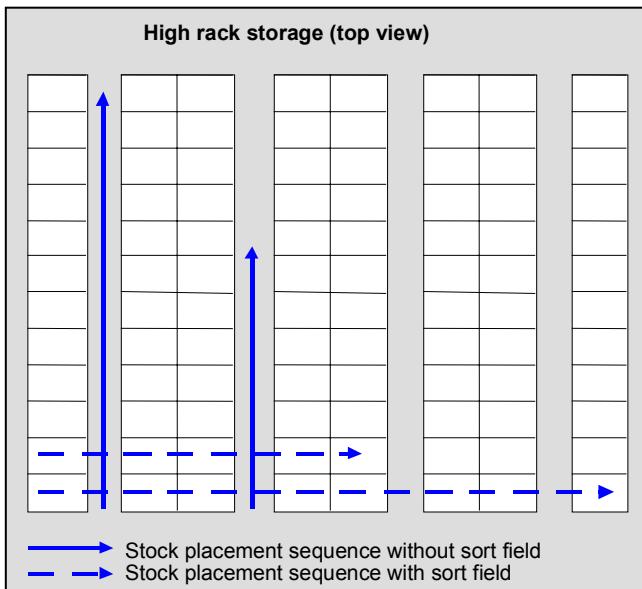
When the system looks for an empty bin with the new structure, the first storage bin it finds is 01-01-01. However, the next time it looks for an empty bin, the next coordinate it finds is 02-01-01, which represents the first stack in the second row. This process continues until all stacks in all rows are filled for the storage type.

You must define the sort variable before you create the storage bins. Any subsequent changes to the table affect only newly created storage bins.

Example

In the examples below we use the "next empty bin" strategy to explain the concept of cross-line searching.

High rack storage (top view)

Stock placement sequence without sort field
Stock placement sequence with sort field

The view shown in the figure is a top view looking down on the warehouse. To make things simpler, we assume that the warehouse consists of one level.

Searching for Bins Without a Sort Variable

When searching for empty storage bins without using a sort variable, the system makes its search based on the following structure:

Empty Storage Bins without Sort Variable

Storage area	Type	Section	Coordinate
001	001	001	01-01-01
001	001	001	01-02-01
001	001	001	01-03-01
001	001	001	01-04-01
001	001	001	02-01-01
001	001	001	02-02-01
001	001	001	02-03-01
001	001	001	02-04-01

With this structure, the system fills the warehouse row by row. For example, the system fills the first row completely first, then the second row, then the third. This can result in a one-sided load of the warehouse.

Searching for Bins with a Sort Variable

When you define a sort variable, empty storage bins are sorted differently. For example, you transfer goods first to stack 01, level 01 in row 01, then to stack 01, level 01 in row 02, then to stack 01, level 01 in row 03, and so on. In this case, you define the sort variable as follows, where **R** is the row, **S** is the stack and **L** is the level:

- Storage bin: RR – SS - LL

- Variable: SS - LL

With the sort variable, empty storage bins have the following structure.

Empty Storage Bins with Sort Variable

Storage area	Type	Section	Variable	Coordinate
001	001	001	01-01	01-01-01
001	001	001	01-01	02-01-01
001	001	001	01-01	03-01-01
001	001	001	01-01	04-01-01
001	001	001	02-01	01-02-01
001	001	001	02-01	02-02-01
001	001	001	02-01	03-02-01
001	001	001	02-01	04-02-01

With this structure, the system fills the bins in the warehouse on a stack-by-stack basis for each row. When the system selects bins for stock received in the warehouse, the first stack in each row is filled, then the second stack in each row, then the third stack, and so on.

Capacity Checking

Use

For some putaway strategies, it is advantageous to require that the system check the capacity of the storage bin when it searches for an available bin. If the capacity check is active, it means that during the process of transfer order creation, the system checks whether the storage bin you selected has the capacity to store the quantity that is to be put away.

Prerequisites

You can implement capacity checking on the basis of a storage type when you define the putaway strategy or the storage type in the Warehouse Management section of Customizing. For more information about activating the capacity check, refer to the Implementation Guide (IMG) for Warehouse Management under *Master Data* → Define Storage Type [Ext.]. To activate the capacity check, enter the number that represents the checking method in the *Capacity check method* field for the putaway strategy in the storage type record.

In order to control the capacity check according to capacity indicators, the following basic prerequisites must be met:

- Each storage bin must have a capacity that is independent of dimension or unit (simply a number).

- Each material can use a specific capacity for each unit of measure.

- Each storage unit type can have a specific capacity for each storage unit.

Features

There are six options available for capacity checking in the Warehouse Management (WM) component. The capacity of a bin can be checked on the basis of:

- Weight

    The weight of the material that is being transferred to the storage bin is checked against the remaining weight capacity of the bin.

- Storage unit type

    You can stipulate that the storage bin can contain only one standard storage unit type. This is taken from the first *SUT* field under *Palletization data* in the material master record.

- Maximum quantity for a bin in the storage type

    You can define the maximum quantity of material that can be stored in a bin for each storage type. This is often used for the fixed bin strategy.

- Capacity indicator (see below)

    -       Usage check based on material
    -       Usage check based on storage unit type (SUT)
    -       Usage check based on material plus SUT
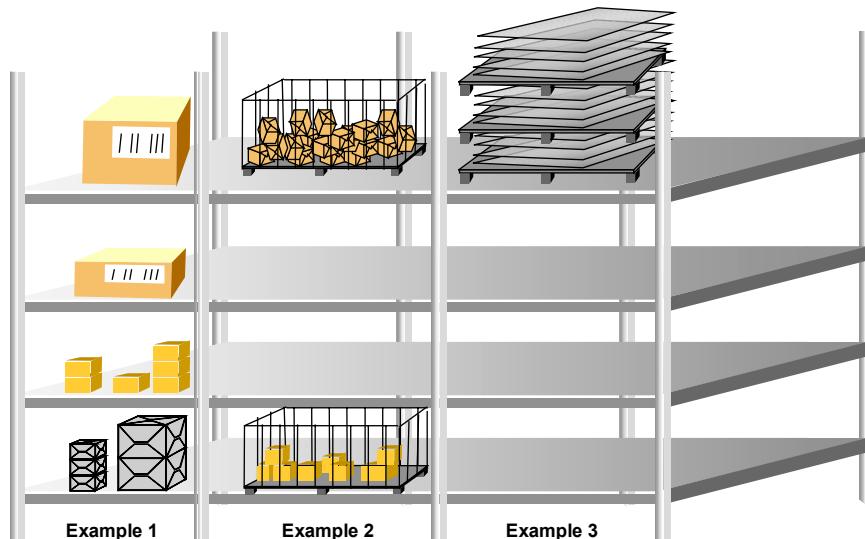
We recommend that you implement a capacity check for the "fixed bin storage" and "addition to existing stock" putaway strategies. For bulk storage, capacity checking is carried out in the block definition.

Capacity Checking

Capacity check according to capacity indicator

You can also use the capacity indicator to control the storage of materials in a storage bin. Depending on the capacity check you select, the system calculates the capacity usage differently.

- For the material, the capacity usage is calculated based on the quant (the quantity of a single material with the same characteristics), as in example 1.

- For SUT checks, the system calculates the capacity usage based on the storage unit type. (Example 2)

- For mixed storage situations, we recommend using the capacity check that is based on the sum of the material and the storage unit type. In SU-managed storage types, each storage unit counts as a separate SUT; in non-SU-managed storage types, each quant counts as a separate SUT.

Example 1　　　　　Example 2　　　　　Example 3

Since the capacity usage is dependent upon the quantity of the material, it is characterized as a variable in the system and is updated in the quant. The capacity usage of an SUT is characterized as a constant capacity usage and is updated in the storage unit in SU-managed storage types and in the quant in non-SU-managed storage types.

Data from quants and storage units are updated for each storage bin as a remaining capacity. This remaining capacity is recorded in the empty bin index. This makes it possible to efficiently find an occupied storage bin with a specific remaining capacity by using a customer exit, for example.

For a full explanation of the three Customizing options using a neutral indicator, see Capacity Checking Based on a Neutral Indicator [Page 386].
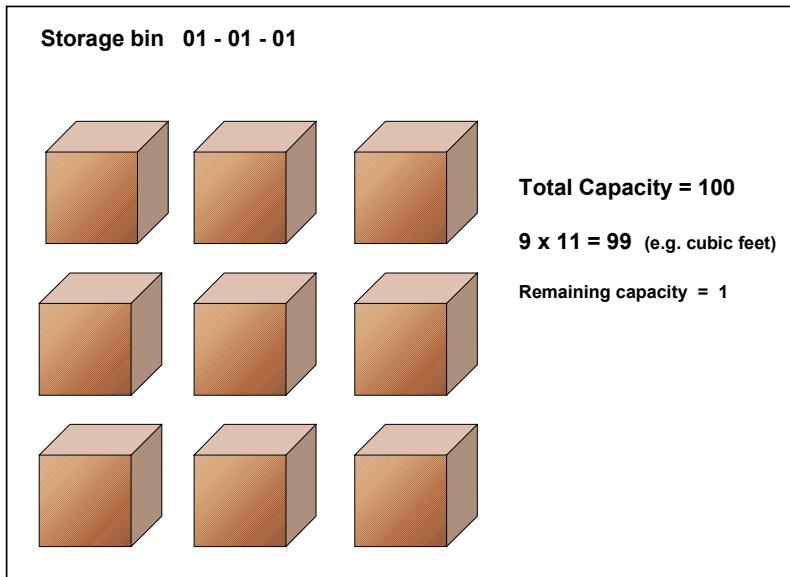
Capacity Checking Based on a Neutral Indicator

The following examples correspond to the three neutral capacity checks. For these examples. The following conditions apply:

- The material is managed in the base unit of measure "pieces" and has a capacity usage of 11 per piece.

- Storage Bin 01-01-01 has a capacity of 100.

- The storage unit type (SUT) has a capacity usage of 12.

1. **Capacity usage check based on the material**

   Nine pieces of the material can be stored in storage bin 01-01-01. This leaves a remaining capacity of 1 as illustrated below. This capacity check is advantageous if you can stack materials as desired into this storage bin. It could also replace capacity checks 2 and 3 if there are different batches that results in mixed storage.

   Important: If you place the same material into the warehouse 5 times, this is not necessarily five separate quants. If storage unit (SU) management is not active in the storage type record, this is generally only an increase in the quantity of a single quant.
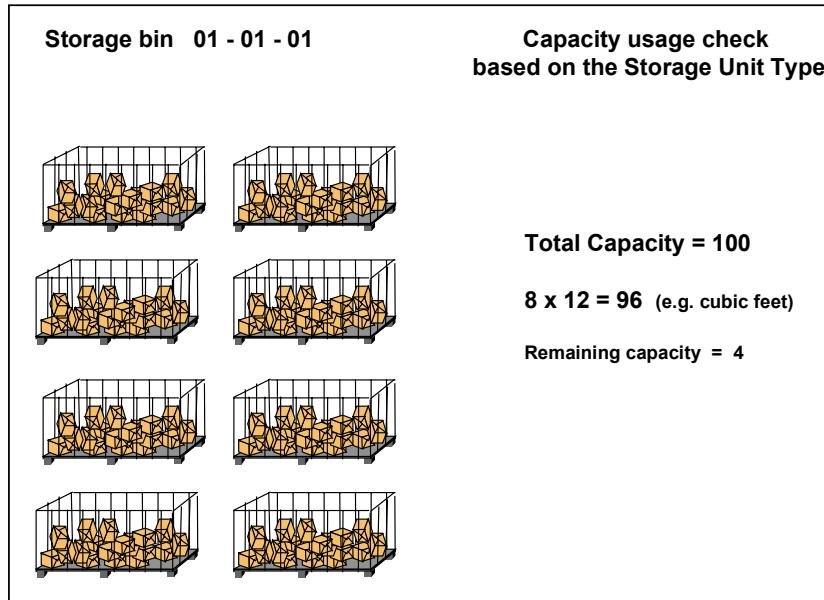
   The capacity checks in points 2 and 3 only function properly when the SUT check and SU management are active in the storage type record.

Capacity Checking Based on a Neutral Indicator
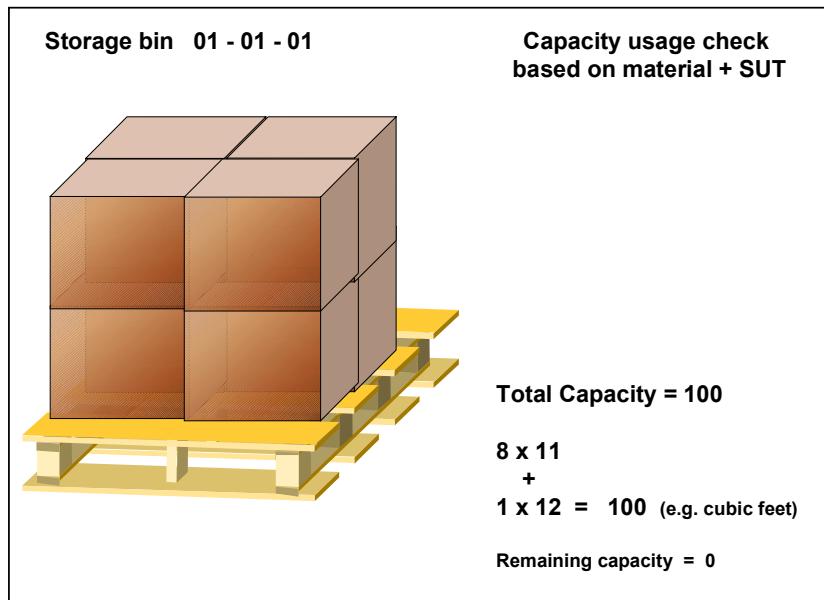
2. Capacity usage check based on the storage unit type (SUT)

Eight full wire baskets can be stored in storage bin 01-01-01. This leaves a remaining capacity of 4. This capacity check is advantageous when the SUTs are next to each other and the materials can be removed one at a time from each container.

Storage bin   01 - 01 - 01   **Capacity usage check
                                          based on the Storage Unit Type**

Total Capacity = 100

8 x 12 = 96 (e.g. cubic feet)

Remaining capacity = 4
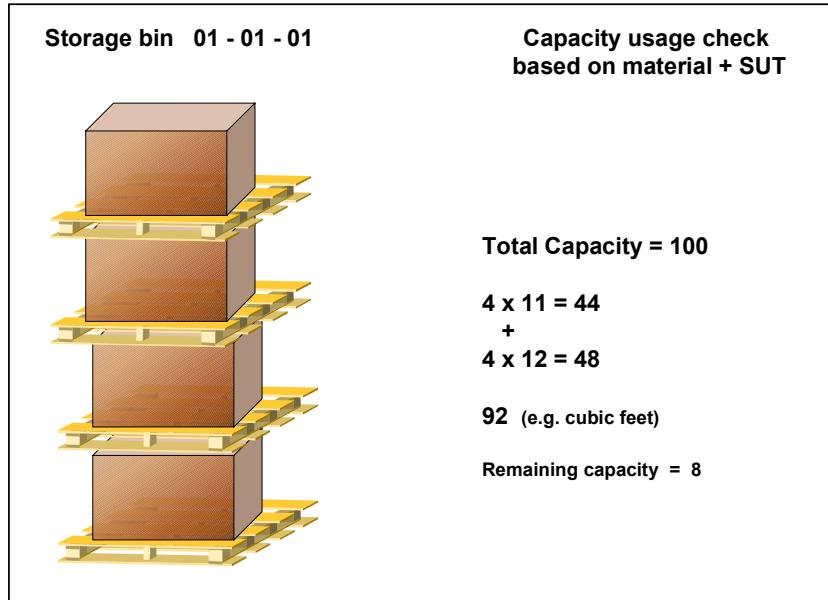
3. Capacity usage check based on the sum of the material and the SUT

Eight pieces can be stored in storage bin 01-01-01 on an E1 pallet. This leaves no remaining capacity for the bin. This is illustrated in the following graphic:

Storage bin   01 - 01 - 01   **Capacity usage check
                                          based on material + SUT**

Total Capacity = 100

8 x 11
      +
1 x 12 =   100 (e.g. cubic feet)

Remaining capacity = 0

If the material is stored in the bin with one piece per E1 pallet, 4 pallets will fit in the bin (44 + 48) and a remaining capacity of 8 exists as shown in the figure below. This capacity check is advantageous if the pallets are stacked on top of each other and the thickness of the pallet must be taken into consideration.

Before you make the first stock placement, you need to define the type of capacity check and the capacity usage of material and storage unit types. Changes that are made to these parameters afterwards cause automatic changes to storage bins, storage units and quants. If you make changes in the operational system, you must run report **RLS10200** to adjust the occupied capacities for bins, storage units and quants.

For more information, see the online documentation for this report.

Picking Strategies

The strategies that are used in WM to remove goods from storage are listed in the following table.
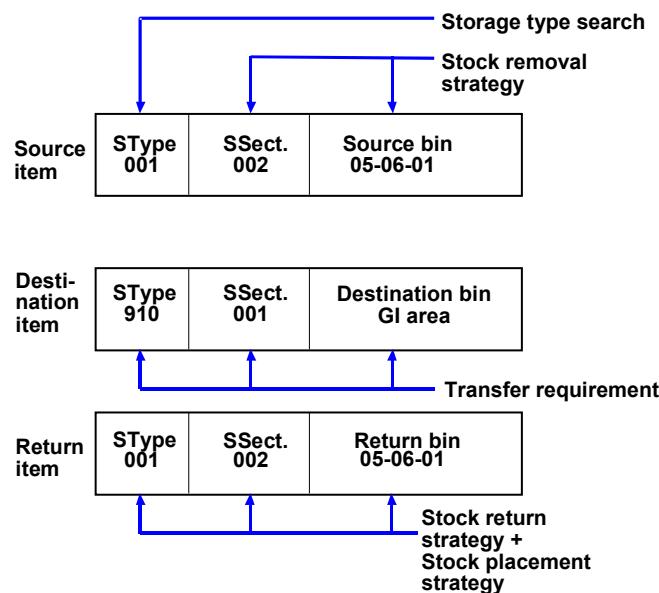
WM Picking Strategies

Strategy	The system searches...
F	for the oldest quant using FIFO [Page 391]
(Blank)	using stringent FIFO for all storage types [Page 392]
L	for the most recent quant using LIFO [Page 393]
A	for partial quantities first, then standard quantities [Page 394]
M	according to quantity [Page 395]
H	for materials with the shortest remaining time before the shelf life expiration date [Page 398]
P	for a fixed bin
(User exit)	customer-defined strategy

To access the objects (tables or views of tables) for the stock removal search strategies, see the corresponding section under *Strategies* in the WM Implementation Guide.

Transfers Out of the Warehouse

The system gets the information for the source and destination storage bins when goods are picked and transferred out of the warehouse as illustrated below.

Information for Stock Removal

When stock is removed from the warehouse, it generally is transferred to the interim goods issue storage area. This information about the destination (interim storage type, interim storage section, and interim storage bin) is recorded in the transfer requirement or the system determines it from the WM movement type.

Storage Type Search

The system must now determine from which storage type the material should be picked. You define this information in the storage type search table. To make entries in this table, see the section on defining the storage type search sequence under *Strategies* in the *Warehouse Management IMG* documentation.

In the storage type search table, you can define a search sequence with up to ten storage types. (Be sure to enter an **A** for stock removal in the *Act.* column.) The list of storage types is hierarchical, that is, the system searches for the material in the first storage type, then in the second storage type, and so on. An entry of *** for the storage type means that the system searches throughout the entire warehouse for the oldest stock. The table entry that the system uses for this search depends on the material being removed from storage.

You can group materials together by a storage type indicator so that the system uses the same search sequence and removes materials from the same storage type or types. To implement this you define a:

- Storage type in the material master record (the *Stock removal* field)

- Storage type indicator in the storage type search table (in the *TyInd* field)

Storage Bin Search

Once the storage type has been determined, the system then searches within the storage type to find an appropriate storage bin from which the material can be removed. To find a storage bin, the system uses a search strategy that has been defined for the storage type. For each storage type you can define one picking strategy.

Customer-defined Strategy

To use customer-defined strategies, you must select the *User exit active* field in the *Stock Removal Control* section of the appropriate storage type record. For instructions, see the section on *Developing function extensions* in the *Warehouse Management IMG* documentation.

Strategy F: FIFO (First In, First Out)

Use

With this picking strategy the system proposes the oldest quant in the storage type as the quant that should be transferred.

The system generally calculates the "age" (length of time in storage) of a quant on the basis of the goods receipt posting date from the Inventory Management (IM) application component. The system automatically sets the goods receipt date in the quant and in the transfer requirement for every goods receipt posting in IM. When the transfer order is created, this date is copied over to the quant record of the destination storage bin.

You can accept the goods receipt date that the system sets or you can enter a different date. Regardless of whether the system proposes the goods receipt date or you enter a different date, the date is used to calculate the age of the quant. This date influences the sorting sequence for each material.

Prerequisites

When you define the storage type record to use this strategy, enter **f** in the *Picking strategy* field.

Strategy: Stringent FIFO Across All Storage Types

Explanation of the Strategy

It is generally assumed that only one picking strategy is allocated to each storage type. However, a strategy based on the storage type is not usable in all sectors of industry.

In WM, it is possible to pick stock according to the FIFO principle by taking into account all quants within a warehouse. In this case, the system does not scan individual storage types in sequence but it proposes the oldest quant in the entire warehouse as the quant to be removed from the warehouse. The system does not take into account the picking strategies specified for the individual storage types. This would lead to inconsistencies.

Some storage types should be excluded from the stringent FIFO strategy, otherwise incorrect picks would result. For example, the interim storage area for differences should be excluded from the stringent FIFO strategy. The stringent FIFO strategy is set or switched off in the table *Exclusion of storage types from Stringent FIFO* (see below).

Setting up the Strategy

In the *Storage Type Search* table enter three asterisks (***) in the first *Storage type* column as illustrated below.

Storage Type Search Table

WNr	Act.	TypIn	B	S	Class	WPC	Ref	1	2	3	...(Stor.Types)
001	A							005	001	004	
001	A			K				001			
001	A		Q					024			
001	**A**	**SFI**						*******			

> 💡
>
> When you create pick transfer orders, you can also enter ******* in the field for the source storage type in the transfer order preparation screen or in the transfer order item screen.

- It is necessary to exclude some storage types, such as the interim storage area for differences, from the stringent FIFO strategy. In the table *Exclusion of storage types from Stringent FIFO* select the *No stringent FIFO* column for the storage type. The system then ensures that this storage type is not used for the stringent FIFO picking strategy. This indicator should be set for **all** interim storage types.

Strategy L: LIFO (Last In First Out)

Use

For some warehouse organizations or sectors of industry, the FIFO principle cannot be used. For example, in the building material industry material that is being stored temporarily, that is, material that is going to be transferred immediately out of the warehouse, is stacked on material that is already in the warehouse. If the FIFO strategy is used during picking, the material lying on top must be moved so that the warehouse worker can reach the material with the oldest goods receipt date. The LIFO strategy is provided for such situations. When the system searches for a quant to remove from stock, it always selects the last quant that was placed into stock.

Prerequisites

When you define the storage type record to use this strategy, enter **L** in the *Picking strategy* field.

Strategy A: Partial Quantities First

Use

With this picking strategy the FIFO principle is overridden in order to optimize the management of stock in the warehouse. The number of storage units with partial quantities in the storage type is reduced to as few as possible. This strategy is appropriate only when

- standard storage unit types are used for stock placement (the same quantity of a material for a specific storage unit type)
- partial storage unit quantities are less than the standard storage unit quantities

Within a storage type there are two different types of quants:

- quant in an amount that is normally contained on the standard storage unit, according to the storage unit type defined in the material master record
- quant in an amount that is smaller than the standard storage unit. This is known as a partial storage unit quantity. A quant that is larger than a standard storage unit should not occur.

When the system searches for a quant, it follows these steps:

1. If the required quantity in the transfer order is the same or greater than the quantity of a standard storage unit, the system attempts to remove a standard storage unit from stock.
2. If no standard storage units are available, partial storage unit quantities are used.
3. If the required quantity in the transfer order is less than the quantity of the standard storage unit, the system first tries to remove partial storage unit quantities from the stock.
4. If no partial storage unit quantities are available, full storage units are broken.

The search for full storage units is carried out according to the FIFO principle.

Prerequisites

When you define the storage type record to use this strategy, enter **a** in the *Picking Strategy* field.

When you create the warehouse data view for the material master record, you must define the specifications for the standard storage unit.

See also:

Material Master Data [Page 98]

Strategy M: According to Quantity

Use

This picking strategy is based on whether the quantity required in the transfer order is large or small. You can have a storage type in which small quantities of material are stored (generally a storage type with a fixed storage bin organization). There can also be a reserve storage in which larger quantities are stored.
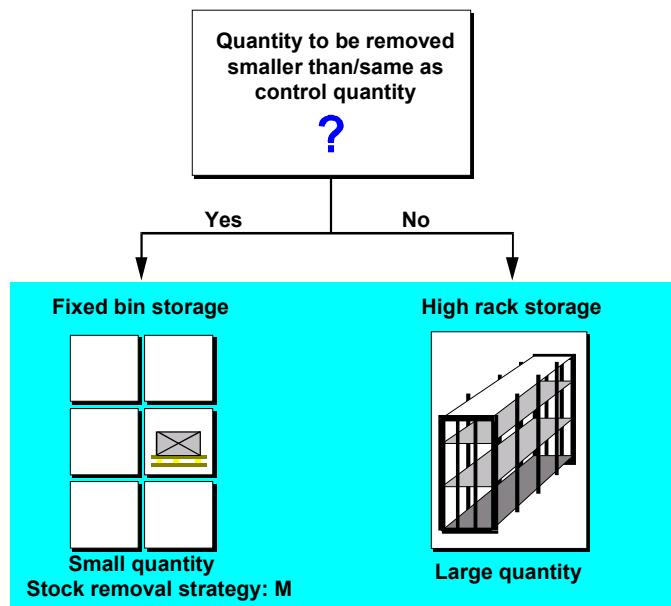
The system decides whether it is dealing with a "small quantity" or a "large quantity", depending on the quantity required in the transfer order. The storage bin that the system proposes for the pick is either from the small quantity storage type or large quantity storage type. As the criterion for this quantity check, the system uses the control quantity defined in the *Control quantity* field in the material master record.

> The system can suggest a stock removal quantity for the picking technique "according to quantity" as well as for "random picking".

Handling Small and Large Quantities

The following figure illustrates how WM handles small and large quantities.

In the example above, two storage types are used to fill delivery notes from the Sales and Distribution system:

- Fixed bin storage

- High rack storage

The system selects the quant from a storage bin in fixed bin storage if the required quantity is less than or equal to the control quantity defined in the material master record. If the required

quantity is larger than the control quantity, the system searches for the quant in high rack storage.

Prerequisites

To use this strategy,

- Enter **m** in the *Picking strategy* field of the storage type record.

- When you maintain the entries in the *Storage Type Search* table, for the first storage type you must enter the storage type for the smallest quantity; for the second storage type in the sequence you enter the storage type for the medium size quantity, and so on.

- When you create the warehouse data view of the material master record, you must enter a quantity for the small quantity storage type in the *Control quantity* field. The system uses this quantity to determine whether the required quantity should be removed from the small quantity storage type or from another storage type.

> For this strategy, the standard system uses movement type 603 to determine which storage type is used for small stock removals for deliveries.

See also:

Material Master Data [Page 98]

Example: Rounding Off Requested Quantities

When you process the picking strategy, you can round off the requested quantity in the transfer order item. In Customizing, you can switch this on in the storage type record in the *Stock removal control* section. You define the rounding quantity itself in the material data for the storage type.

Quantity rounding is advantageous in combination with picking strategy "M". For example, if pallet quantities, carton quantities or individual quantities are to be picked from a chain of three storage types, this can be attained by defining the rounding quantity and control quantity in the material master record as follows:

For the **first storage type** in the storage type search sequence (removal of a single piece) you enter the number of pieces in a carton minus one as the control quantity. You do not need to maintain the rounding quantity since this does not have to be rounded. For requested quantities that are greater or equal to a carton, the system will then skip over this storage type.

For the **second storage type** in the search sequence (removal of complete cartons) you enter the pallet quantity minus one as the control quantity in the material record. The rounding quantity is the carton quantity. For requested quantities that are greater than or equal to one pallet, the system skips this storage type. The system only generates transfer order items for complete cartons. For the remaining quantity (individual pieces) the system reenters the storage type search sequence and picks these from the first storage type.

You do not need to enter a control quantity in the material master for the **third storage type** in the search sequence (removal of complete pallets). The rounding quantity is the pallet quantity. The system only generates transfer order items for full pallets. For the remaining quantity, the system returns to the storage type sequence and picks from the first or second storage type.

For this logic, you should be aware of the two following points:

- The system does not round to zero. This means that if there are not enough individual pieces in the first storage type, a carton in the second storage type will be broken open.

- If the requested quantity is larger than the available quantity in a storage bin, it is not rounded. In other words, if a carton plus a few individual pieces are located in a bin in the second storage type and the requested quantity is larger, the bin will be emptied.

Strategy H: Shelf Life Expiration Date

Use

With this picking strategy, the system ensures that materials with the oldest expiration date will be removed from stock first.

Prerequisites

To set up the system to manage materials with a shelf life expiration date (SLED), you need to carry out the following tasks:

- Activate shelf life expiration date management in the *Control Data* section of the warehouse number record.

- Activate picking strategy **h** in the storage type records concerned.

- Maintain the data in the *Storage* view of the material master record.

Color Codes in the SLED Control List

If the color is	the expiration date
Green	has not yet been reached.
Yellow	is today's date.
Red	has been exceeded.

You should use this report as a batch request for larger quantities of stock.

See also:

Shelf Life Expiration Date [Page 118]

Displaying Materials with a Shelf Life Expiration Date (SLED) [Page 119]

Strategy P: Fixed Storage Bin

Use

In this picking strategy, the system uses the storage bin that was entered in the material master to find stock.

> We recommend that you set up replenishment control for the fixed storage bin when you use this strategy.

For further information, select *Strategies → Picking Strategies →* Define "Fixed Bin" Strategy [Ext.] in the Implementation Guide (IMG) for Warehouse Management.

Prerequisites

A fixed storage bin must be assigned to the affected materials in the material master.

Stock Return Methods

Purpose

When stock is picked from a storage type for which the "complete stock pick" has been defined, sometimes small quantities are left over after the required quantity is picked. The remaining quantity is returned to a storage bin via a "return" sub-item in the transfer order.

With the *Warehouse Management* (WM) component, you have three methods at your disposal for returning quantities to a storage bin.

- The stock remains at the destination bin, that is, the storage bin to which it is transferred.

  The remaining quantity remains in the picking area.

- The stock is returned to the source bin, that is, the storage bin in which it was originally stored.

  The remaining quantity is returned to the high rack storage area where the original quantity was stored.

- The stock is transferred to another storage bin (warehouse for partial quantities).

  If the stock is returned to another storage bin, the system uses the putaway strategy specified for this storage type. You can change the default that the system proposes for the return storage bin in the transfer order.

Prerequisites

Regardless of the method used, you must also set the *Complete Stock Pick Active* indicator in the *Pick Control* section of the storage type record.

> The return method described here is **not** valid for SU-managed storage types. If you are implementing the complete stock pick for SU-managed warehouses, only the variants "complete stock pick with return to the same storage bin" or "complete stock pick using a pick point" are possible. Departures from this rule are only possible by using a customer exit.
>
> (For a description of the stock return methods used in SU-managed storage types, see Partial Stock Picks [Page 427].)

Process Flow

When the system searches for a storage bin for the return quantity, it uses the following hierarchy.

1. The overdelivery quantity **can** be kept in the storage bin to which it was transferred, that is, the destination storage bin in the transfer order.

   You must set the *Retain overdeliveries* indicator in the *Putaway Control* section of the storage type record for the destination storage type.

2. The return quantity is returned to the storage bin from which it was transferred, that is, the source storage bin in the transfer order.

Stock Return Methods

You must set the *Return stock to same storage bin* indicator in the *Stock Pick Control* section of the storage type record for the source storage type.

3. The return quantity is transferred to the storage type and bin according to the movement type.

   In the movement type record, you must define the return storage type and the return storage bin. (See Movement Types [Page 144])

4. The return quantity is transferred to a storage type defined in the storage type record.

   You must enter a storage type in the *Return storage type* field in the *Pick Control section* of the storage type record for the source storage type.

5. The return quantity **must** be kept in the storage bin to which it was transferred, that is, the destination storage bin in the transfer order.
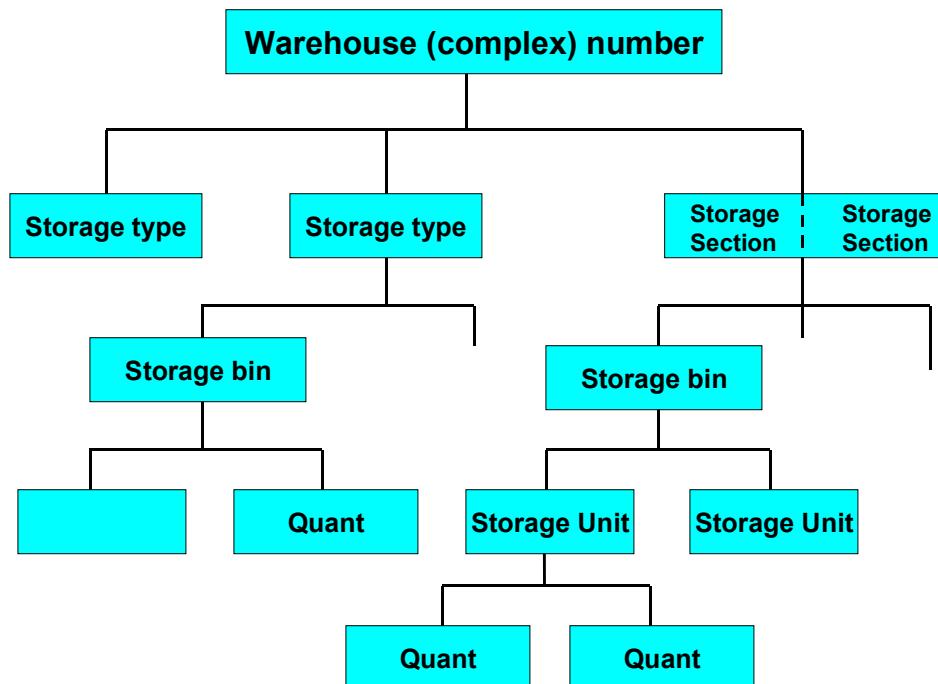
Storage Unit Management

Purpose

Storage unit (SU) management in Warehouse Management (WM) enables you to optimize warehouse capacity and control material flow by utilizing storage units within the warehouse.

A storage unit is a logical grouping of one or several amounts of material such as a pallet or a container that can be managed within a warehouse as a unit that belongs together. Storage units can be either homogeneous (containing one material item only) or mixed (containing two or more material items).

All storage units, whether the materials are stored on standard pallets, wire baskets or other containers, are assigned an identifier — a number — which is maintained in the system as the storage unit number. Therefore, it is possible at any given time to know where each storage unit is located in the warehouse complex, the amount of material contained in it, and which operations have been processed or planned for it.

```
                    ┌──────────────────────────────┐
                    │  Warehouse (complex) number  │
                    └──────────────────────────────┘
           ┌───────────────┬──────────────────────┬──────────┐
   ┌──────────────┐  ┌──────────────┐      ┌──────────┬──────────┐
   │ Storage type │  │ Storage type │      │ Storage  │ Storage  │
   └──────────────┘  └──────────────┘      │ Section  │ Section  │
                    ┌──────┴───────┐       └──────────┴──────────┘
             ┌──────────────┐           ┌──────┴───────────────┐
             │ Storage bin  │     ┌──────────────┐
             └──────────────┘     │ Storage bin  │
           ┌────────┴────────┐    └──────────────┘
   ┌──────────────┐ ┌──────────┐ ┌────────┴────────┐
   │              │ │  Quant   │ │ Storage Unit │ │ Storage Unit │
   └──────────────┘ └──────────┘ └──────────────┘ └──────────────┘
                              ┌──────┴──────┐
                        ┌──────────┐ ┌──────────┐
                        │  Quant   │ │  Quant   │
                        └──────────┘ └──────────┘
```

When SU management is not active in a storage type, all stock is managed as separate quants at the storage bin level. With SU management, stock is managed at the pallet or storage unit level. A storage bin can have one or more storage units. Similarly, each storage unit can consist of one or more quants.

Selection Criteria

Storage unit management is generally activated in the warehouse for the following reasons:

- Movement of mixed pallets (with more than one material) as a single unit within the warehouse

Storage Unit Management

- Identification and management of materials using storage unit numbers assigned internally or externally

- WM can communicate with fork lift control systems via an interface without having to maintain material data in the external system.

Prerequisites

Before using storage unit management, you must first set up the default values for your warehouse. This initial configuration is accomplished using the customizing function.

For information on how to configure WM for Storage Unit Management, see the *Implementation Guide (IMG) for Warehouse Management*.

> It is only possible to deactivate SU Management in the warehouse number record if it has first been deactivated in the subordinate storage types.

Features

In addition to the capabilities already available in WM, the activation of storage unit management in your system enables you to access several functions that are specifically designed for working with storage units.

Using SU management, you can

- Create homogeneous and mixed storage units

- Place materials into storage using an identification (ID) point

- Create transfer orders and confirm stock movements for storage units

- Transfer whole storage units internally

- Add stock to existing storage units

- Display the contents of storage units

- Print documents to accompany storage units

- Plan goods issues, for example, to stage materials in replenishment storage bins in production

All storage unit management functions are fully integrated with WM.

Warehouse Management at the Storage Unit Level

Use

Storage unit (SU) management in the Warehouse Management (WM) applications component makes it possible to optimize warehouse capacity and control material flow utilizing storage units within the warehouse.

Features

Structure of a Storage Unit Record

In the system, a storage unit record consists of a header and at least one material data record (quant data record).
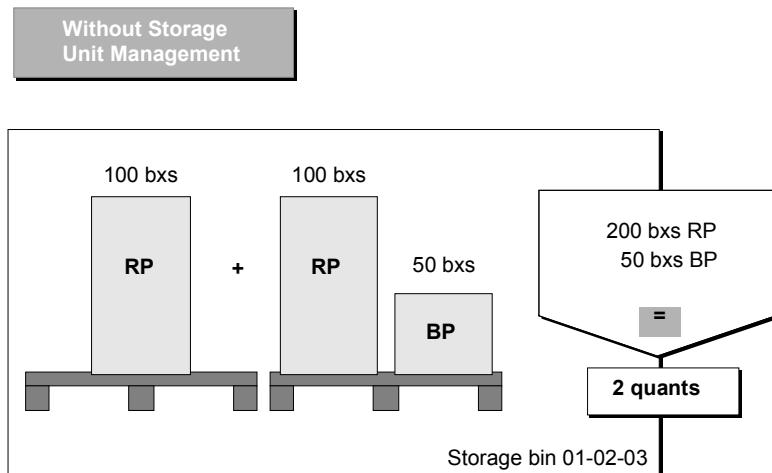
The **header** contains information which is relevant for the entire storage unit and includes the:

- Storage unit number

- Storage unit type (SUT) of the storage unit

- Storage bin in which the storage unit is currently located

- Status, which provides current information about the storage unit

Specific information about the stock contained in a storage unit is found in the **material data record**. The material record is already familiar to you in the existing system as a quant data record. For SU management, this information can be managed at the storage unit level.

The following graphics illustrate how WM handles storage bins **with** and **without** the use of storage unit management. For these examples, storage bins are displayed in which 200 boxes of red pencils and 50 boxes of blue pencils are stored. The stock is distributed on two pallets.
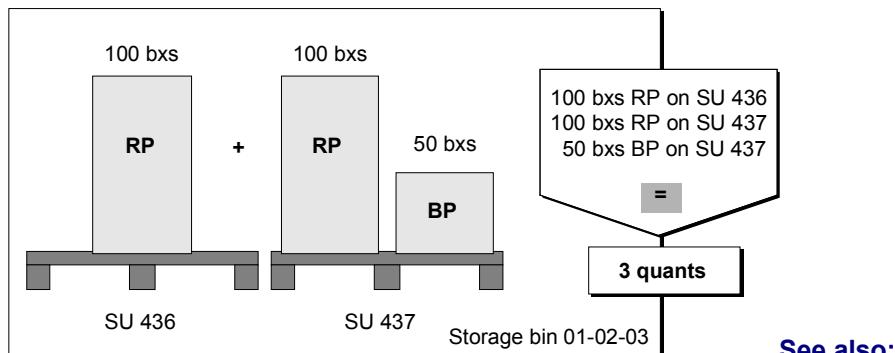
Without SU management, there are a total of 2 quants (a specific quantity of red pencils and a specific quantity of blue pencils) in the storage bin (see the figure below). The system has no information about the pallets themselves.

With SU management, there are three quants in the storage bin - one quant on the first pallet and two quants on the second pallet as illustrated in the figure below. Information about each pallet is stored in the system and is linked to the storage unit number.

Storage Unit Management

With Storage Unit
Management

100 bxs   100 bxs

RP   **+**   RP   50 bxs

BP

SU 436   SU 437

Storage bin 01-02-03

100 bxs RP on SU 436
100 bxs RP on SU 437
50 bxs BP on SU 437

=

3 quants

See also:

[Material Master Data [Page 98]](#)

SU-Managed Storage Types

Use

In your system, you decide at the storage type level whether storage units will be managed within a particular storage type or not.
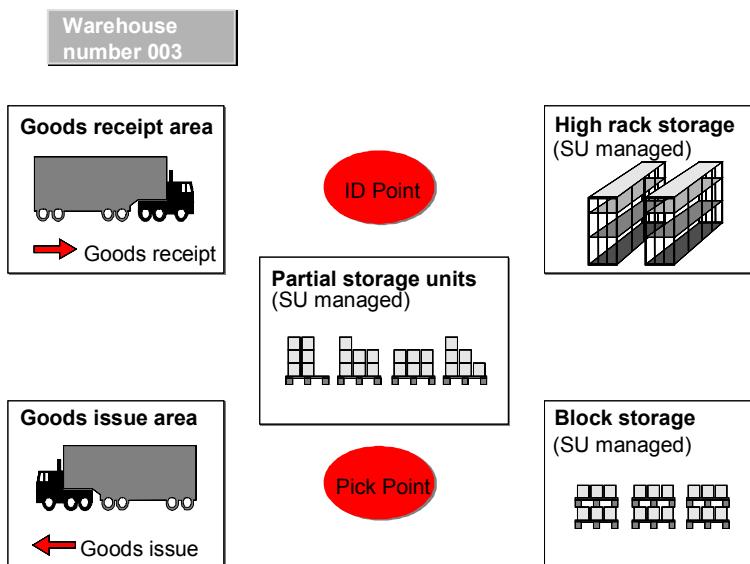
> ⚠️
>
> Define storage unit management for physical storage types only. Interim storage areas cannot be SU-managed.

Prerequisites

To define a storage type for SU management, see *Storage units → Master data → Define storage type control* in the *Warehouse Management IMG* documentation.

Features

The following illustration shows how storage unit management may be implemented in a warehousing complex.

You process goods issues when SU management is active in your system using basically the same procedures as those used in WM without SU management. For more information on the creation of a transfer order for goods issues, refer to the section Goods issue for an IM Posting [Page 236].

The only difference for SU-managed storage types is that storage unit numbers are displayed on the corresponding screens.

Preparation Screen for Picking

When you process a goods issue (for example, for a delivery document or to a cost center), you will eventually display the transfer order preparation screen, provided you have not run processing in the background.

SU-Managed Storage Types

On this screen you can influence how the system searches for stock to be picked for the goods issue. For example, in the *Storage type* fields you can suggest up to 15 storage types from which the storage units are to be taken. If you select *All storage types*, you can have the system propose up to 30 storage types for picking.

You can also manually enter specific storage units in the *Source storage unit* field on this screen.

After you have created the transfer order items, the system displays all the information on the storage unit in one line.

Stock List

From the transfer order preparation screen, you can also display a list of available materials for the stock picking.

To call up the list, choose *Stocks* in the application toolbar. From this list, you can choose materials by selecting the respective items and then choosing the field *Calculate selected quantity* in the lower section of the screen. The system reduces the quantity above the table controls accordingly. You can also enter the required quantity manually in the column *Selected quantity*.

Transfer Order Item Generation Screen

If you always choose background processing when creating a transfer order for a stock pick, you will eventually see the transfer order item generation screen.

On this screen you see data that is proposed by the system for the transfer order item. You can change these proposals on the transfer order item screen "at the lowest level".

In the *Storage unit* field, the storage unit number that the system proposes for this stock pick is displayed. (Of course, for storage types that are not SU-managed, nothing will appear in this field.) By overwriting the information in this field, you can manually select storage units for a stock pick.

See also:

The Warehouse Structure in WM [Page 17]

Putaway using Storage Unit Management

This section contains the following topics:
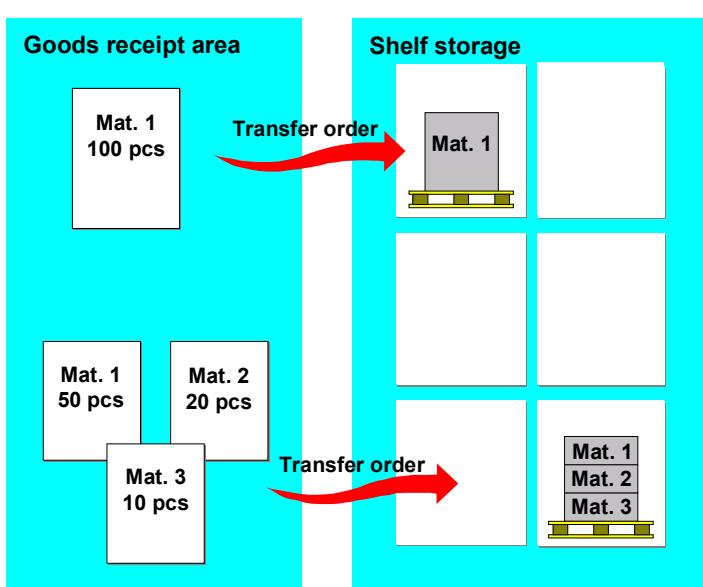
Creating Storage Units

The system creates homogeneous storage units automatically when the putaway takes place in a storage type that is managed for storage units.

This takes place as a normal process when you create transfer orders as illustrated below.

A separate transfer order item that specifies both a source storage bin as well as a destination storage bin is created for each material to be put away.

When you create transfer orders for stock putaways involving storage units, this means that:

- If a homogeneous storage unit is put away, the putaway is recorded in a single transfer order item.

- If a mixed storage unit is put away, a separate transfer order item is created for each material item in the storage unit.

     In this case, all the transfer order items have the same destination storage bin since they are all part of the same storage unit.

You can create transfer orders in WM from transfer requirements or you can create them manually.

For both options, you can

- Create homogeneous storage units

- Create mixed storage units

- Add materials to (expand) existing storage units

In the following explanations and examples, all putaways are carried out by transferring stock from a storage type that is not SU-managed (goods receipt area) into an SU-managed storage type.

Creating Homogeneous Storage Units

To create a transfer order for homogeneous storage units from the transfer requirement item overview screen, complete the following steps:

1. Select the desired item, change the quantity in the *Open quantity* field to the desired quantity and choose *Create TO in foreground* to create the transfer order in the foreground.

2. On the preparation screen, you have the same "normal" functions that exist in WM without SU management to enter or change data for a transfer order.

   For the system to create storage units, you must select a destination storage type that is managed for storage units in the *Palletization* section. You can enter this manually or define it for automatic selection in the material master record and storage type search strategy sequence.

   On this screen, you can also manually enter storage unit numbers for each of the storage units. Choose *Create TO in foreground.* to complete the preparation screen for the transfer order in the foreground or choose *Create TO in background.* for background processing.

3. To create the transfer order, choose *Create*.

If you decide to process the creation of the transfer order in the foreground on the preparation screen, the transfer order item screen is displayed.

On the transfer order item screen you have the possibility to influence the creation of the transfer order item at the "lowest level". You can also enter the storage unit number on this screen.

Creating Mixed Storage Units for a TR

Mixed storage units contain two or more material items. This procedure describes how to create a mixed storage unit containing more than one item from the transfer requirement overview screen.

Procedure

1. Choose : *Logistics → Logistics Execution → Internal Whse Processes → TransRqmt → Display → By storage type* from the SAP menu, enter Source storage type 902 (goods receipt area in the standard system) and choose ENTER.

   There are several ways to arrive at the transfer requirement overview screen. This manual method is used for this example only.

2. Select a transfer requirement with two or more items and choose *TO in foreground*.

   The system displays three tabs:

   – *Active work list*

   – *Inactive items*

   – *Processed items*

   Change the quantities in the *Selected quantity* data fields to the desired quantities.

   Choose *Create SU (single)* from the application toolbar.

   The system displays the preparation screen for placing the mixed storage unit into the warehouse.

3. On the preparation screen, you must enter the storage unit type (SUT) of the storage unit that you are creating in the *Storage unit type* field.

   Depending on the settings in *Customizing* for Warehouse Management, you may also need to enter a destination storage type that is SU-managed.

   Choose *Create trans.order* to complete the preparation screen for the transfer order.

   If you did not enter them manually, the system assigns the storage bin and SU number for the storage unit.

   On this screen you also have the option to choose *Reset transfer order*. This makes it possible for you to enter a new SU number and/or destination storage bin.

4. To complete the task, post the transfer order to the database.

The system creates a separate transfer order item for each material item in the storage unit.

If an error occurs when you create a transfer order item (for example, if you attempt to store a mixed pallet in a storage area where mixed storage is not allowed), the system displays the item screen when the error occurs for the corresponding SU item.

Adding Materials to an Existing Storage Unit

Using SU management, you can add materials to existing storage units. To do this, you must know the number of the storage unit to which you want to add stock.

To add materials to an existing storage unit, from the transfer requirement overview screen,

1. Select the desired item in the first column. Choose *TO Foregrnd.* Change the quantity in the *Selected quantity* data field to the desired quantity. Choose *Goto* → *Storage unit* → *Addition to stock*.

2. Enter the SU number of the existing storage unit in the dialog box that appears and choose *Copy*.

    On the transfer order preparation screen, the system selects the *A* column to identify items that already exist in the storage unit.

    The item(s) that are to be added to the storage unit appear in the list with the existing items.

3. To create the transfer order items to be added to the storage unit, choose *Create trans.order*.

4. To complete the transfer order, choose *Create* from the application toolbar.

Creating Storage Units Manually

Use

When you create transfer orders for storage units manually, the same functions are available as those for creating transfer orders based on transfer requirements. You can

- Create homogeneous storage units

- Create mixed storage units

- Add items to an existing storage unit

For information on how to create transfer orders when SU management is not active in your system, see Creating Transfer Orders [Page 161].

Procedure

Creating homogeneous storage units

1. Choose *Logistics → Logistics Execution → Internal Warehouse Processes → Stock Transfer → Create Transfer Order→ No Source Object* from the SAP menu.

2. Enter the warehouse number, movement type (501 in the standard system), material, requested quantity, plant and storage location and choose *Preparation*.

3. On the preparation screen, enter a storage type that is managed for storage units and choose *Stock placement background*.

    The system proposes both a destination storage bin and a destination storage unit. If the destination storage type is assigned to an ID point, the system creates the TO working item with the ID point storage type (see Using an ID point [Page 421] and Example: Putaway using an ID point [Page 422]).

4. To complete the task, post the transfer order to the database.

Creating mixed storage units

1. Choose *Logistics → Logistics Execution → Internal Warehouse Processes → Stock Transfer → Create Transfer Order→ Create Storage Unit*.

2. On the initial screen you must enter the warehouse number and the movement type. You can enter the SU number manually.

    You can also enter additional default information that is then valid for all items of the storage unit you are creating.

    Choose *Preparation.*

3. On the TO preparation screen you enter the storage unit type and a list of the materials and quantities to be contained in the storage unit.

    Depending on the settings in *Customizing*, you may also need to enter a destination storage type that is SU-managed.

4. Choose *Create trans. order* to complete the preparation screen for the transfer order.

    The system assigns the storage unit number and storage bin for the storage unit, unless they have already been entered manually.

Creating Storage Units Manually

On this screen you also have the option to choose *Reset TO*. This makes it possible for you to enter a new storage unit number and/or destination storage bin.

5. To complete the task, post the transfer order to the database.

You can also use this procedure to create single homogeneous storage units. In this case, enter only one material item for the storage unit in the transfer order preparation screen.

Add materials to an existing storage unit

1. Choose *Logistics → Logistics Execution → Internal Warehouse Processes → Stock Transfer → Create Transfer Order→ Expand Storage Unit*.

   On the initial screen you must enter the SU number of the storage unit. You can also enter default information that is then used for all items of the storage unit you are extending. In addition, you must enter the movement type for the material to be added to the storage unit.

   Again, you have the option of entering default information that will be used later in the transaction for each item to be added.

2. To go to the transfer order preparation screen, choose *Preparation*.

   The system displays two tabs:

   – *Items to be added*

   – *Stock in SU*

   The *Items to be added* tab is used to enter the materials that you want to add to the SU. The *Stock in SU* tab lists the materials that are already in the SU.

   Certain values displayed on this screen (for example, the destination storage bin) cannot be changed because they pertain to the already existing storage unit.

3. Enter the materials, quantities and any other pertinent information for materials that you want to add to the storage unit and choose *Create trans.order*.

   The system creates the working items for the transfer order.

   At this point, you still have the option to choose *Reset TO* if you need to add more materials or correct the working items.

4. To complete the task, post the transfer order to the database.

Automatic Bin Search

In WM, you define strategies the system uses to "automatically" search for storage bins for stock placements and removals.

When SU management is active, WM automatically finds storage bins in basically the same manner as in the standard system without SU management. This includes the methods used to store homogeneous storage units.

However, one question must be discussed regarding mixed pallets: "How does WM search for storage bins with mixed storage units?"

See also:

Posting Changes [Page 326]

Storing Mixed Pallets

Since mixed storage units contain more than one material item, the system must select one of these materials to use as a basis for the storage bin search process. The selection of this material item is purely arbitrary.

The characteristics defined for the selected material are then used to carry out the automatic storage bin search function. All other material items contained in the storage unit must follow and are transferred to the storage bin selected for the material item that was chosen for the search process.

System Checks

Independent of the material selected by the system for the automatic storage bin search function, the normal system checks are carried out for all materials in the storage unit (such as hazardous materials checking or mixed storage) to insure that no errors occur for stock placements.

Confirming Transfer Orders for Storage Units

When you confirm a transfer order or a transfer order item, you are verifying that the required quantity of material has actually been transferred from one location to another and that the processing of the transfer order or item has been completed.

When SU management is active in your system, you have three options for confirming transfer orders. You can

- Confirm a complete transfer order

- Confirm one of several items in a transfer order

- Confirm open items for a single storage unit

1. To confirm a transfer order for a storage unit, choose *Logistics → Logistics Execution → Internal Whse Processes → Stock Transfer → Confirm Transfer Order → Single Items for Storage Unit → In One Step* from the SAP menu.

2. Enter the storage unit number. Choose ENTER.

    The system displays a list of all the open transfer order items for the storage unit.

3. From this point you confirm transfer orders with or without differences using the same procedures described for the standard system without SU management.

See also:

Transfer Order Confirmation [Page 173]

Displaying the Contents of a Storage Unit

In WM, you can display storage unit (SU) numbers in all functions in which stock review screens are normally displayed.

In these functions, you can display the header information for a storage unit or the stock contained in a particular storage unit.

To display storage unit information

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Single Displays → Storage Unit* from the SAP menu.

2. Enter the SU number in the *Storage unit* field on the initial screen and choose ENTER.

3. If you choose *Display*, information about the storage unit itself is displayed.

    From this screen, you can choose *Storage bin* to display information about the storage bin or *Stock* to display the contents of the storage unit.

    If you choose *Stock* and there is only one item in the storage unit, the system displays information about the quant. If there is more than one item in the storage unit, the system displays the stock item list.

    From this list, choose *Storage bin* to display information about the storage bin. To display information about a quant, move the cursor to a line in the item list and choose *Quant*.
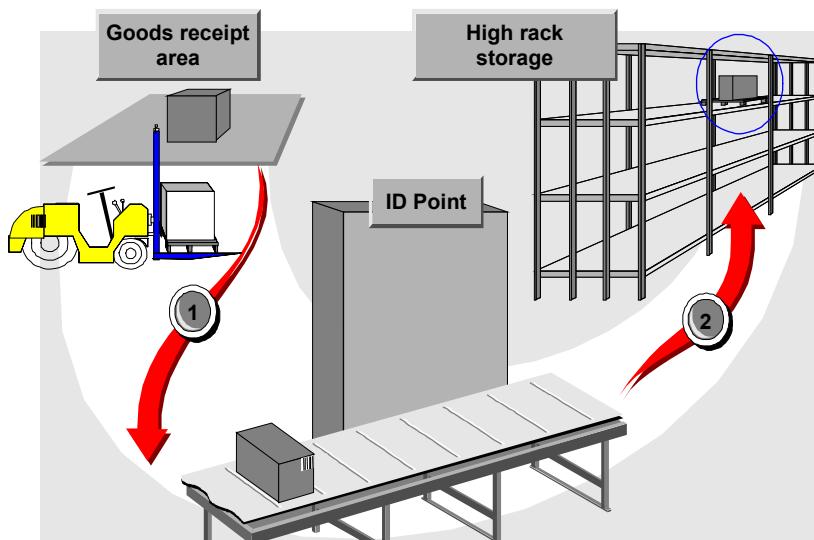
Identification Point

Definition

In many warehouses, certain storage types (such as high rack storage areas) require identification (ID) points. The transfer of all storage units into these storage types must be accomplished via the ID point. In WM, the ID point is a physical location in a warehouse managed for storage units where incoming goods are identified for further processing.
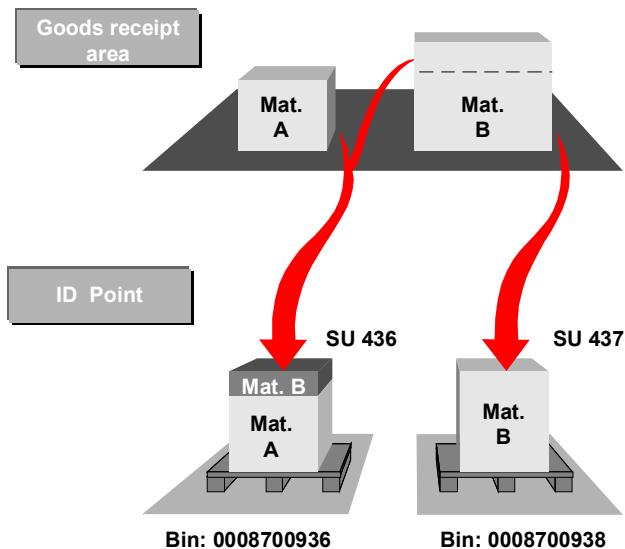
Use

The transfer of stock from the goods receipt area via an ID point into a high rack storage area is illustrated in the following graphic.

For example, if you have assigned the ID point storage type 011 to storage type 010, when you attempt to store goods in storage type 010, the system will automatically send them to ID point storage type 011 first.

When goods are transferred from the goods receipt area to the ID point, the system assigns dynamic coordinates to the storage bin using the quant number. This is illustrated in the following graphic:

For mixed pallets, the system arbitrarily selects one of the quant numbers from the materials in the storage unit.

Structure

An identification point can be used for the following purposes:

- **Comparison of system information to actual contents**

    Since storage units are identified by their storage unit number when they are put away, the contents of each storage unit can easily be displayed on the computer screen. This makes it possible to make a rough comparison of the system information with the physical contents of the storage unit.

- **Contour control**

    An automatic contour control is often carried out at the ID point to determine whether the storage unit was loaded properly.

- **Changing the mode of transport**

    Frequently, the mode of transport is changed at the ID point. For example, storage units are often transferred from a fork lift to a conveyor.

- **To determine the final destination**

    The destination storage bin in the final storage type is determined at the ID point. Since the destination bin is not assigned until the storage unit arrives at the ID point, the location of the bin is issued based on the most current information about the available space in the storage area.

Using an ID Point

An identification point is defined in the WM system as a storage type.

To avoid misunderstanding, definitions are provided for the following terminology:

ID Point Storage Type

The ID point storage type is a storage type that is managed for storage units. ID point storage types are not entered into the storage type search strategy configuration table.

Physical Storage Type

The physical storage type is the final destination for a storage unit during putaways. This storage type must be entered into the table for storage type searches.

Therefore, the total putaway process for a storage unit consists of two steps:

1. First, a transfer order moves the storage unit to the ID point.

2. A second transfer order moves the storage unit from the ID point to the final storage bin.

Defining an ID Point Storage Type

To define a storage type as an identification point, see *Storage units → Master data → Define storage type control* in the *Warehouse Management IMG* documentation.

Example: Putaway Using an ID Point

Once you have defined the ID storage type and the final storage type in *Customizing*, you can transfer storage units initially to an ID point before moving them to their final destination in the warehouse.

Prerequisites

Specify a storage type as the ID point for another storage type in the storage type record.

The following example demonstrates the transfer of a storage unit into high rack storage via an identification point. For this example, we have specified storage type 011 as the ID point for storage type 010.

The following procedure describes how to manually create a transfer order for a storage unit from a transfer requirement with one item.

Procedure

From the transfer requirement overview screen

1. Choose *Environment → TO in foregr.*

    The system goes to the palletization screen to prepare the storage unit for putaway.

    💡

    If there is more than one item in the transfer order, the system displays three tabs. The *Active work list* tab lists the open items. If you choose *Palletization*, the procedure is basically the same as described below with the exception that you must process the items one at a time. For more detailed information about creating transfer orders from the tabs, see Creating a TO for a Transfer Requirement Manually [Ext.].

2. On the transfer order preparation screen, enter **010** as the destination storage type and choose *Putaway bckgrnd*.

    The system assigns a storage unit number and destination storage bin (the quant number as a dynamic coordinate).

    Although we entered **010** as the destination storage type, the system automatically assigns the pallet to the identification point in storage type **011**, which was defined in the storage type data record.

3. To create the transfer order choose *Transfer order → Post*.

At this stage in the two-step process, the first transfer order which brings the storage unit to the ID point is created and the first step is completed.

What happens now that the storage unit has arrived at the identification point?

See Transferring Storage Units from the ID Point [Page 423]

Transferring a Storage Unit from the ID Point

Usage

Once a storage unit is received at the ID point, it is moved to the final destination storage bin using the transaction *Move Storage Unit*. This transaction can be used for several purposes, but it was designed specifically to move individual storage units from the ID point into the final storage type.

Procedure

The following procedure describes how the transaction works:

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Stock Transfer → Create Transfer Order → Move Storage Unit* from the SAP menu.

2. Enter the storage unit number and movement type into the appropriate data fields and choose *Goto → Preparation*.

> We recommend that you create a new movement type **that specifies the destination storage type** in the warehouse to be specifically used for storage unit transfers from the ID point. Initially, you can use movement type 999 (warehouse supervision) for testing purposes. To define the movement type for internal transfers from the ID point, choose *Logistics Execution → Warehouse Management → Activities → Define Transaction Parameters* in *Customizing* for *Warehouse Management,* and enter the new movement type for transaction code LT09.

    The system then searches for any existing open transfer orders for the storage unit.

    If no open transfer orders exist, the system displays the transfer order preparation screen.

    If an open transfer order is found, you can confirm the open items and post the transfer order to the database (see <u>Confirming Transfer Orders [Page 175]</u>).

    After you confirm the open items, the system displays the preparation screen for the transfer order that will move the storage unit from the ID point into the final storage type.

3. On the preparation screen the system lists the current contents of the storage unit. You can manually enter the destination storage bin or allow the system to choose it for you.

    Choose *Goto → Create trans.order*.

    The system then elects to transport the storage unit from the ID point to the final storage type. This is directed, among other things, by the entries you make for the destination storage type and bin when you define the movement type.

4. To create the transfer order and post it to the database, choose *Transfer order → Post*.

Result

A second transfer order is now created which transfers the storage unit from the ID point to its destination - a storage bin in the final storage type.

Once the transfer order is confirmed, the stock placement via an ID point is completed.

Stock Picking Using Storage Unit Management

In this section we explain how transfer orders are processed for picking storage units whenever materials are picked for goods issue. Also, you will learn how to set up storage types with picking strategies for Storage Unit Management (SU Management).

For each of the primary methods used in SU management to process transfer orders, an example is presented to clarify what happens both physically and in the Warehouse Management (WM) component itself.

For information on goods issues using the standard WM component, see Goods Receipt [Page 193] and Stock Picking Strategies [Page 389].

Picking Strategies Used in SU Management

For warehouses in which storage unit management is active, the manner in which picking strategies are carried out in the system is basically the same with or without storage unit management – they are material-oriented and quantity-oriented in WM.

When you create a transfer order item to pick a certain material, the system searches for storage bins with the required quants based on the strategies defined in the system. How the system automatically attempts to find requested materials is also carried out in the same manner.

For stock picks, the difference between SU-managed storage types and storage types without SU management are described as follows:

- When a specific quantity is removed from an SU-managed storage type, not only the storage bin information is updated, but also the storage unit involved.

- When you create pick transfer orders, you can display storage units on selected screens. This allows you to manually select storage units proposed by the system.

- In SU-managed storage types, complete stock picking is defined differently. Also, the respective functions have been changed.

Complete Stock Picks in SU-Managed Storage Types

You should activate complete stock picking when you cannot pick stock from the storage bin itself.

You define how complete stock picks are handled in the system at the storage type level. For information on how to define storage type default values for SU management, see the *Warehouse Management IMG* documentation.

For storage types that are not SU-managed, the system always removes the entire quant. After the required material is picked, the system finds a return bin for the remaining part of the quant. A return item is created within the transfer order item that specifies where the partial quant will be placed. For a description of this process, see Releasing Stock from Inspection [Page 335].

For SU-managed storage types, complete stock pick does not refer to the picking of quants but to storage units. When only part of the materials in the storage unit are required, this means that the entire storage unit must be removed from the bin.

Returning Stock to the Same Bin

If you have defined "complete stock pick" for a storage type, regardless of whether it is SU-managed or not, you also have the option of activating the *Return same bin* field.

Stock Picking Using Storage Unit Management

"Return stock to the same bin" means that, whenever a quant or storage unit is partially emptied by picking only part of the materials contained in it as the result of a complete stock pick, the remaining materials are returned to the same storage bin from which they were removed.

For storage types that are not SU-managed, remaining partial quants are normally returned to their original storage bins; for SU-managed storage types, partial storage units can also be returned to their original bins or they can be returned to a storage type specifically designated for partial pallets.

Options for Complete Stock Picking

Based on the definition for complete stock pick and returning stock to the same bin described above, there are three options available for configuring your SU-managed storage types:

- No complete stock pick

- Complete stock pick with return to the same bin

- Complete stock pick using a pick point

These three processes are described in Partial Stock Picks [Page 427].

Life Cycle of a Storage Unit Number

A stock pick has a destination storage type in WM – normally, this is the interim storage type for goods issues. As mentioned in SU-Managed Storage Types [Page 406], interim storage areas cannot be SU-managed.

What happens then, when an entire storage unit is moved from a SU-managed storage type into a storage type that is not SU-managed?

Storage Unit Transfers into Storage Types that are not SU-managed

What occurs is exactly the opposite of when a storage unit is moved from a storage type that is not SU-managed into an SU-managed storage type. If you have a stock putaway into an SU-managed storage type, the system creates a storage unit number for the storage unit concerned. If you have a stock pick from a non-SU-managed storage type, on the other hand, the storage unit number of the storage unit is lost.

This means that the storage unit no longer exists in WM after an entire storage unit is moved to a storage type that is not SU-managed and the transfer order items for that storage unit are confirmed,.

Storage Unit Transfers into SU-managed Storage Types

For optimization or other reasons, there are some situations in which you create transfer orders to move storage units from one SU-managed storage type to another SU-managed storage type within the warehouse.

For these types of movements, the following options are available:

- When a complete homogeneous storage unit is removed and transferred to another SU-managed storage type, the SU number is not changed.

- When only part of a storage unit is removed and sent to another SU-managed storage type, this "part" receives a new SU number if it is not included as part of an already existing storage unit.

Partial Stock Removals

In the following sections, we describe the processes that take place in the system when only part of the stock is removed from full storage units.

There are three options to configure a storage type for removing storage units.

- No complete removal requirement

- Complete removal requirement with return to the same bin

- Complete removal using a pick point

For each of the examples, it is assumed that the storage type from which stock is removed is a storage type in which SU management is active.

No Complete Removal Requirement

By "no complete removal" we mean that only part of the stock in a storage unit is picked and the storage unit remains (with the rest of the materials) in the same bin.

Using this method of stock removal, several transfer orders can be processed simultaneously to pick materials from a single storage unit. The storage unit is not blocked by the system (for example, due to unconfirmed transfer order items).

The storage unit remains in the same bin throughout the entire process. Although the quantity of material to be picked is blocked when the transfer order is posted in the system, all of the remaining stock in the storage unit is available.

Complete Removal Requirement with Return to Same Bin

For this process, only part of the materials contained in a storage unit are removed. As mentioned in "Strategies" in Stock Removals Using Storage Unit Management [Page 424], you can define a storage type for organizational reasons so that an entire storage unit is removed for order picking. The partial storage unit with the remaining materials is then returned to the same storage bin from which it was removed.

In WM, for this process, the storage unit remains internally in the same bin. The temporary condition, during which the storage unit physically leaves the storage bin and returns again, is not displayed in the system.

When you post a transfer order to remove a specific quantity of material from a storage unit, the remaining materials on that storage unit are blocked from removal by other transfer order items.

(The only exception occurs for multiple processing. See Posting a Goods Receipt Based on a Purchase Order [Page 200] for more information about this exception.)

Complete Removal Using a Pick Point

For this process, a complete storage unit is removed from a storage bin and moved to a specific location in the warehouse (the pick point) where part of the materials in the storage unit are picked. The partial storage unit with the remaining materials is then moved - usually in a predefined manner - to a new storage bin in the warehouse.

See also:

Using a Pick Point [Page 428]

Pick Point
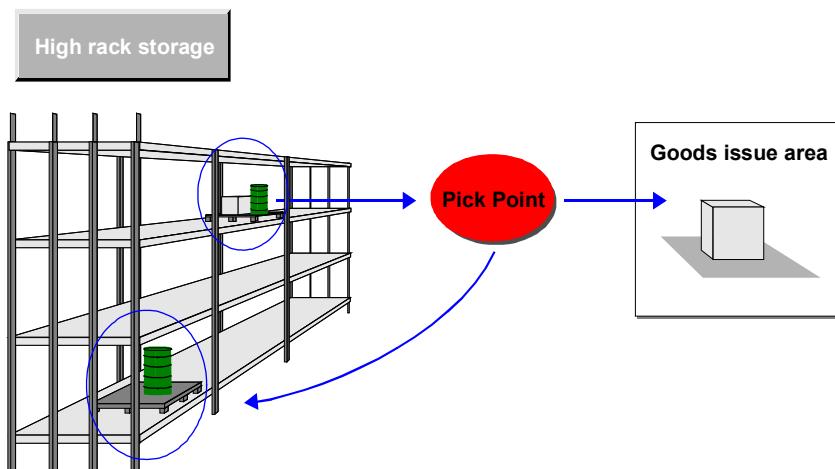
Definition

The pick point is the actual location in the warehouse where items are picked for a partial stock pick from a storage unit.

In an automatic high-rack storage area, the pick point may be a specific point along a conveyor belt to which storage units have been transferred for order picking. A pick point may also be a marked floor area where entire pallets can be brought for picking material items.

Use

The following graphic shows how sotrage units for picking are assigned to a pick point and afterwards how they are brought to another storage bin.

Once a storage unit is moved to a storage type that is not managed for storage units, the storage unit number is lost. Therefore, if all the materials in a storage unit are transferred to the goods issue area, the storage unit ceases to exist in WM. To receive the storage unit when only part of the materials is picked, the storage unit is brought to the pick point. The required goods are picked and transferred to the goods issue area. The storage unit is then returned to the warehouse with the remaining goods. This means that the remaining goods are still assigned to the original storage unit number in WM. In this case, the transfer order contains not only a source and destination storage bin, but also a return bin.

Returning Storage Units

For your organization, there are several possibilities for what happens to a partial storage unit at the pick point after picking. Two examples are as follows:

- The partial storage unit is returned to the same storage type from which it was picked, and a new storage bin is selected.

- The partial storage unit is transferred to another storage type (for example, to a storage type that is specifically designated for partial storage units).

Configuration of a Pick Point

Before you pick stock from a storage type using a pick point, you must configure the storage types using the Customizing function.

- First, you must define a pick point storage type.

- Secondly, you must connect the pick point to the SU-managed storage type from which stock is to be picked.

For more information, refer to the Implementation Guide (*IMG) for Warehouse Management.*

Picking Using a Pick Point

After you remove stock from a complete storage unit using a pick point, it is often necessary to return the storage unit to another bin. This process is described as follows:

1. First, a transfer order item is created to pick part of the materials from a specific storage unit. This item identifies the source storage bin as the bin where the storage unit is located and the destination storage bin for the quantity required is identified as an interim storage bin in the goods issue area.

   Technically (in the system), the storage unit remains in the source storage bin, but is blocked for further stock removals.

   (The only exception occurs for multiple processing. See Posting a Goods Receipt Based on a Purchase Order [Page 200].)

2. As a result of the SU document that was printed when the transfer order was created (or the notice that was sent to the warehouse control unit), the entire storage unit is physically removed from the storage bin and transferred to a pick point.

3. At the pick point, storage units are received with the transaction
   "*TransOrder → Confirm → Storage unit*".

   After entering the storage unit number, individual removal items are displayed on the screen and can be confirmed.

4. When the last item picked is confirmed, the storage unit with the remaining contents (which up until now was located technically in its original storage bin) is posted in the system to the pick point. This system transfer takes place in the background without the need for creating a transfer order.

   At this point, the storage unit is located both physically and technically at the pick point.

5. Finally, the remaining material items in the storage unit are transferred from the pick point to a new storage bin using the transaction "*TransOrder → Create → For storage unit*". The primary entry parameters for this transaction are the storage unit number and the movement type.

   By defining a new movement type to direct storage units to a specific storage type, you can configure the system to match your organizational requirements.

   Steps 3, 4 and 5 above are accomplished by switching back and forth between the transactions "*TransOrder → Confirm → Storage unit*" and "*TransOrder → Create → For storage unit*". To expedite this process, you can create a user-specific program to link the two transactions as required.

   See Example: Returning Stock from a Pick Point [Page 431]

Example: Returning Stock from a Pick Point

To demonstrate what happens in the system when stock is removed via a pick point and a partial storage unit is returned to another bin, let's assume that you want to manually create a transfer order for a goods issue to a cost center for 250 boxes of pencils. For this example, one pallet normally contains 100 boxes of pencils.

To process this example, you must complete the following tasks in the order shown:

- Create the transfer order for the storage unit

- Confirm the transfer order items

- Transfer the remaining quantity from the pick point to another storage bin

Creating a Transfer Order for a Storage Unit

On the transfer order preparation screen, you have several options for selecting material items to be picked for the goods issue:

1. To process material items one at a time, choose *Create TO in foreground.*

   To allow the system to process material items for you, choose *Create TO in background.*

   To display and select from a list of available stock, choose *Stock*.

2. To demonstrate what happens physically and in the system, for this example, let's assume that you chose *Create TO in background*.

   The system selects 3 homogeneous storage units containing 100 boxes of pencils. However, only 50 boxes of pencils are to be removed from the third storage unit.

3. Post the transfer order to the database.

Confirming Transfer Order Items for Storage Units

To confirm the items for a transfer order that was created for a storage unit

1. Choose : *Logistics → Logistics Execution → Outbound Process → Goods Issue for Outbound Delivery → Picking → Confirm Transfer Order → Single Items for Storage Unit → In One Step* from the SAP menu .

2. Enter the storage unit number for the first item in the transfer order in the *Storage unit* field.

   Enter **d** (process in background) in the *Foreground/background* field and choose ENTER.

   The first item is confirmed.

3. Enter the storage unit number for the second item in the transfer order, enter **d** in the *Foreground/background* field and choose ENTER.

   The second item is confirmed.

What happens to full homogeneous storage units when they are confirmed?

When full homogeneous storage units are confirmed, they are transferred to the goods issue area. Since the goods issue area is not SU-managed, the storage unit number information is lost and is no longer recognized by the system.

If you attempt to display the storage units for either of the first two items, the system responds with an error message that the storage units do not exist. The SU numbers

were lost when the material was moved to the goods issue area (which is not SU-managed).

What happens to the partial storage unit?

Before the third and final item is confirmed, technically (in the system), the storage unit is still located in the original storage bin although, physically, it has been removed from that storage bin and brought to the pick point.

If you display the storage unit information for the third storage unit (Master Data → Storage Unit → Display), the header indicates that there is one open transfer order item. At this point, the storage unit has a status of "3" (to be picked).

4. After you confirm the transfer order item for the third storage unit, if you display the storage unit information again, you will find that the storage unit with the remaining quantity was posted to the pick point. The quant number of the remaining 50 boxes in the storage unit is displayed as the storage bin.

Now, the storage unit is located both physically and technically at the pick point.

(The 50 boxes requested by the third item in the transfer order were picked and transferred to the goods issue area.)

To complete this task, you must transfer the remaining quantity from the pick point to another storage bin in the warehouse.

Transfers from a Pick Point

During a partial stock removal using a pick point, once the required stock has been picked and the storage unit has been posted to a pick point, the only task that remains is to transfer the storage unit with the remaining quantity from the pick point back into another storage bin in the warehouse. To do this, you must create a new transfer order.

The manual procedure is as follows:

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Stock Transfer → Create Transfer Order → Move Storage Unit* from the SAP menu.

2. Enter the storage unit number and the movement type on the initial screen.

As mentioned in "Transferring Storage Units" in , we recommend that you define a new movement type to direct storage units to a specific storage type to match your organizational requirements.

To display the preparation screen for placing a storage unit into stock, choose *Preparation*.

3. On the preparation screen you can enter the destination storage type, section and bin.

You can also return the storage unit to the same storage type from which it was originally removed.

4. Choose *Create trans.order* to create the transfer order.

The system selects a new storage bin for the remaining quantity.

5. To post the transfer order to the database, choose *Transfer order → Post* from the menu bar.

Once you confirm the transfer order, the process is complete.

Example: Returning Stock from a Pick Point

Example: Returning Stock from a Pick Point

SU-managed Bulk Storage

SU-managed bulk storage is defined as a bulk storage area in which stock is managed at the storage unit level. In bulk storage, several storage units fit into a single storage bin (one row in a block of rows).

Use

Why use SU-managed bulk storage?

- The goods receipt date can be managed at the storage unit level.

- You can pick storage units from bulk storage containing materials that belong to more than one batch.

- It is not possible to determine the storage unit until confirmation.

Features
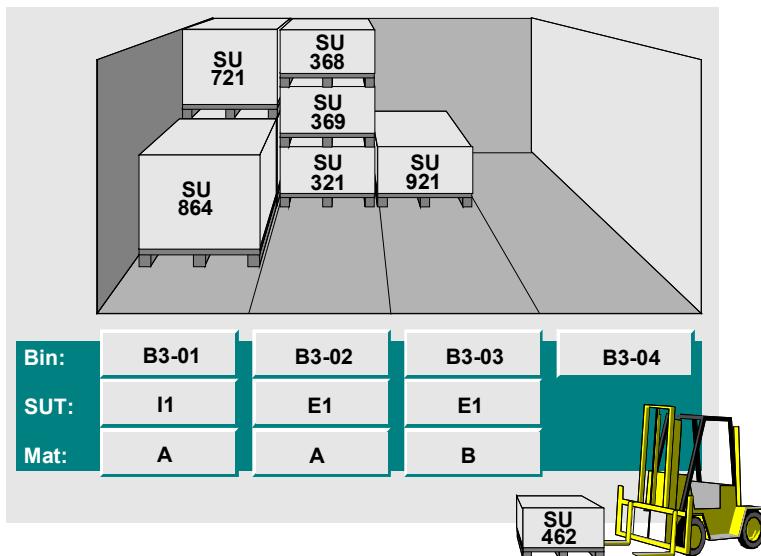
In SU-managed bulk storage, you can:

- Manage partial quantities

- Manage all combinations of mixed storage

    – Store both homogeneous and mixed storage units in a storage bin

    – Allow mixed storage without any restrictions whatsoever

- Select preferences when storing materials in bulk storage that:

    – Forbid mixed storage entirely (only one material number and storage units with only one quant is allowed)

    – Allow several materials in a storage bin, but only one material on an individual storage unit with different batches

    – Allow only one material in a storage bin, but with different baches in both the bin and in the storage unit

    – Allow only one material number in a storage bin with different batches, but with only one batch in a storage unit

These features can be selected in *Customizing* when you define the parameters for SU Management.

The figure below illustrates an SU-managed bulk storage area with storage bins that are occupied.

SU-managed Bulk Storage

Bin:	B3-01	B3-02	B3-03	B3-04
SUT:	I1	E1	E1	
Mat:	A	A	B	

One of the primary characteristics of SU-managed bulk storage is that the system does not keep a record of the exact location of a particular storage unit in a bin. Because of this, the system does not know which storage units are located in the "front" of a bin making them accessible for picking.

Identification of Storage Units in Bulk storage

For stock removals, this characteristic presents a problem. Since the system does not have a record of the actual structure of the storage units in a block, it cannot recommend specific storage units for order picking.

Consequently, a stock removal is initially "neutral" as far as storage units are concerned. When you create a transfer order, there can be no reference to specific storage unit numbers, because the system cannot identify which storage units are picked until they are physically removed from a storage bin. The SU numbers that you select must then be communicated to the system when you confirm the transfer orders. Afterwards, the system can make the appropriate updates.

System Controls

As in other SU-managed storage types, you manage stock in bulk storage at the storage unit level. Since you cannot determine which storage units will be selected for order picking, you can create transfer orders for stock removals without identifying storage unit numbers. Consequently, you initially create transfer order items which specify only a requirement (not to be confused with a transfer requirement) to pick a certain quantity of material from a designated block or storage bin in bulk storage. For this purpose several system controls are provided for bulk storage.

Partial Picking

Using this parameter, you can control whether partial pallets are allowed in a storage type. A partial pallet is a pallet whose quantity is not the same as the standard quantity defined in the material master record.

You can activate *partial pallet management* independently from the *mixed storage* parameter. This indicator **must** be selected when you use mixed storage indicators "B" (several batches per bin and storage unit) and "X" (unrestricted mixed storage).

You can also configure *Customizing* using the switch *complete stock removal* so that you can pick only full pallets even when partial quantities are allowed.

Total Quant Count

Since the system cannot identify specific SU numbers for stock removals, an availability control is implemented to prevent the system from attempting to remove too many storage units from individual blocks. This problem is resolved in WM by the so-called **total quant count**.

In bulk storage, the total quant count is the sum total of all stock (for each material and batch) in a storage bin. Information about stock stored in each bin is maintained in the same manner as without SU management. However, the system additionally keeps track of the total stock that has accumulated in the entire storage bin. The table below illustrates how the system calculates the total quant count.

Total Quant Count Calculation

SU No.	Material	Quants	Pieces	
7886	AA	1	100	
7887	AA	1	100	
7893	AA	1	100	
7788	AA	1	100	
			————	
			400	**Total Quant Count**

The total quant count always represents the total stock situation in a storage bin in bulk storage.

System Controls

Stock Placement

When you place storage units into bulk storage, both individual quants and the total quant count are updated immediately. For example, if you add another storage unit to the storage bin illustrated in the above table, a normal quant is added and the total quant count is increased accordingly.

Stock Placement Checks

When you putaway storage units, the system checks the *mixed storage* indicator to ensure that storage units are stored properly.

Stock Removal

When the system creates the transfer order item for a stock removal, it does not create it for a specific quant or storage unit.

(The exception to this is when you manually request a specific storage unit or quant for picking. In this case, the sytem creates a normal transfer order item.)

Initially, the system only reduces the available quantity of stock in the total quant count. No other updates are possible, because the system does not know at this point which storage units will be picked.

The parameter "complete removal" determines the actual quantity that is removed from the total quant count. Therefore, if you have defined *complete stock removal* for the storage type, the available quantity in the total quant count is reduced accordingly based on the standard amount defined in the material master for the pallet type. Complete stock removal is automatically active when partial pallets are not allowed. If complete stock removal is not active, the system reduces the total quant count by the exact amount that is requested.

Confirmation

When you confirm transfer order items for stock removals from bulk storage, you communicate the storage unit numbers that were actually picked to the system. The system updates the storage unit and quant information.

Processing Remaining Quantities

The processing of remaining quantities depends on whether you have entered a pick point storage type in the storage type record. Remaining quantities occur during confirmation when the requested quantity is smaller than the quantity contained in the storage unit that was picked. This means that the processing of remaining quantities does not take place until you confirm a transfer order.

If you have defined a pick point for the storage type, the storage unit is transferred to the pick point. If it is a mixed storage unit, the system also posts any other materials in that storage unit to the pick point. If there no pick point defined for the storage type, the remaining quantity stays with the storage unit in the same storage bin.

Confirmation

When you confirm the transfer order, the same thing happens that would normally happen when you remove a storage unit that was picked from any SU-managed storage type for which "complete removal" is defined. Partial pallets that exist as a result of stock removals from bulk storage are posted to a pick point and, subsequently, are placed into a storage type where partial storage units are allowed.

See also:

Partial Storage Unit Processing [Page 442]

Transfer Order Processing for Stock Removals

When you create a transfer order to pick a certain material from SU-managed bulk storage, a normal transfer order item is created. As mentioned previously, this transfer order item is "neutral" with respect to storage units because the individual SU numbers have not yet been identified by the system. In the system, this initial transfer order item behaves more like a transfer requirement item, since it neither updates the actual stock nor the storage unit(s) required.

Process

What happens when you communicate to the system the storage units that were actually picked from bulk storage?

1. First, the "neutral" transfer order item data is updated. This means that, for this item, the confirmed quantity is increased accordingly.

2. Secondly, items are added to the transfer order based on the storage units that were actually picked from the bulk storage bin for this movement.

3. Once the stock removal for a bulk storage bin has been completed, the "neutral" transfer order item is deleted.

Confirming SU-Neutral Transfer Order Items

Processing Stock Removals from Bulk storage

There are many variations to the following example and the screens that appear depend upon settings in *Customizing*, the menus you select and the entries you make on subsequent screens. The following is a typical example.

> Let's assume that you want to remove 450 boxes of material TESTMAT from bulk storage. If there are 100 boxes of TESTMAT in each storage unit, the system will create a transfer order to remove 5 storage units from SU-managed bulk storage.
>
> The transfer order will initially contain only one "neutral" transfer order item indicating that 450 boxes of material TESTMAT are to be picked from bulk storage.

Procedure

To confirm the transfer order in the example, a possible manual procedure is as follows:

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Stock Transfer → Confirm Transfer Order → Single Document → In One Step* from the SAP menu.

2. Enter the transfer order number and warehouse number in the appropriate data fields and choose ENTER.

   The system displays the transfer order overview screen with four tabstrip folders.

3. Select the transfer order item in the *Active work list* that removes the 5 storage units and choose *Confirm internally* from the application toolbar.

4. On the storage unit number entry screen, enter the SU numbers for the storage units picked in the *Storage unit* column (or scan them for picking) and choose ENTER.

   The system suggests the available quantity as the pick quantity. For one of the storage units, enter only 50 boxes as the quantity to be picked. Depending on the *Customizing* settings, the system will post the remaining 50 boxes to the pick point storage type.

   > You can change the pick quantity or enter a difference quantity. You cannot enter the remaining quantity. Instead, the system calculates the remaining quantity from the available quantity and the difference quantity. If you reduce the pick quantity to 0, it is the same as not picking the storage unit.
   >
   > If the quantity of the first SU you enter exceeds the pick quantity, the system automatically suggests the removal quantity (the quantity required in the transfer order item) as the *Pick quantity* and calculates the *Remaining quantity*.

   > If you decide not to process a remaining quantity the system will confirm the transfer order with an overdelivery.

Confirming SU-Neutral Transfer Order Items

> If the *Confirmation* field in the "End of confirmation" section of the screen is selected, the system will carry out the confirmation and ignore any differences in the transfer order.

5. Choose *Confirm in foreground* or *Confirm in background*.

How to Process Differences

6. If there are differences, enter the difference in the *Difference quantity* field and choose ENTER.

> The system calaculates the remaining quantity. Choose *Confirm internally*.

7. In the dialog box that appears, choose *Confirm difference* or cancel and correct your entries.

8. To complete the transaction, choose *Transfer order → Post*.

> The system clears the "neutral" transfer order item and creates the transfer order items for each storage unit removed from bulk storage.

Displaying Transfer Orders after Confirmation

If you display the transfer order after it has been confirmed, item 1 (the neutral item) no longer exists and the individual storage units that were picked are added as separate items in the transfer order.

See also:

Confirming Transfer Orders [Page 175]

Displaying Transfer Orders [Page 165]

Partial Storage Unit Processing

When you remove part of the contents from a full homogeneous storage unit from bulk storage, you may want to store it in another storage type. To do this, you need to assign a pick point to SU-managed bulk storage when you define the storage type record. This is done using the same procedures as those used for other SU-managed storage types.

For bulk storage types in which partial pallets are allowed or in which mixed storage is allowed, the use of a pick point is not required.

See Using a Pick Point [Page 428] for information on how to define storage types for this purpose.

Bulk storage Control Parameters

To insure that the proper amount of stock will be removed from storage, see the section *Strategies → Stock placement strategies → Define strategy for bulk storage → Define storage type control* in the *Warehouse Management IMG*.

In *Customizing* you need to maintain two parameters, "*Total*" and "*Round Off*", for SU management in connection with the processing of partial storage units.

Level of Total Quant Count

The *Total* field is used for internal calculation of the total quant count for SU-managed bulk storage. This parameter influences both stock placements and stock removals.

Stock Placement

For putaways this parameter controls whether the system will automatically mix batches or not. If the parameter is set to "1" (batch neutral), the system looks for a storage bin where the material already exists. The batch number is not taken into consideration in this case. If the parameter is set to "2" (batch specific), the system looks for a storage bin where the batch of the material already exists and attempts to add the new stock to the existing stock. If that isn't possible, the system looks for an empty storage bin.

Stock Removal

The parameters that influence picking include the "Complete removal requirement", the "level of the total quant count" and whether or not a pick point is entered in the storage type record.

The level of the total quant count controls how the totals information is processed. The system calculates the total quant count separately for each storage bin and for each material that is in this storage bin in SU-managed bulk storage areas. Materials that require batches can also influence this level. If the parameter is set to "2" (batch specific), the system calculates a total quant count for each batch. If the parameter is set to "1" (batch neutral), all the batches of this material are added together.

For stock removals, when the total quant count has been calculated for batches, you must also specify the batch in the transfer order item to ensure that the quantity is subtracted from the corresponding total quant count. This means that the user may only pick from a storage unit that contains this batch.

When you confirm the transfer order, the system checks whether the storage unit entry also contains the corresponding batch.

Round off

When you choose *RoundOff*, you optimize the procedure for picking from SU-managed bulk storage areas. This function is explained in detail in the example.

Optimizing the Removal of Partial Storage Units

When you select the *RoundOff* data column, the system optimizes the removal of partial storage units.

Prerequisites

The primary prerequisite is that you have defined the stock removal procedure in such a way that the system first selects a storage type for picking which is managed for large/small quantities and, afterwards, selects the bulk storage area. As a result, the system searches for a particular material first in a picking area (large/small strategy) and then in bulk storage.

See also:

Example: Optimization in Bulk Storage

The following example illustrates how the optimization process works. The storage type search strategy is defined so that it searches for a material first in a picking area and afterwards in a bulk storage area in which full storage units with the same material are stored.

For this example, 350 boxes of a material are to be picked. The material is stored on pallets which contain 100 boxes each.

What Happens in the System Without Optimization?

The system begins by looking for the material first in the picking area. Since the 350 boxes constitute too large an amount for the picking area (due to the control quantity definition in the material master), they are not removed from the picking area.

Next, the system searches for the 350 boxes in bulk storage and finds them there. **Four** full pallets with 100 boxes each are picked since complete removal is generally required for stock removals from bulk storage.

As a result, a partial pallet now exists that contains 50 boxes of the material.

What Happens in the System With Optimization?

As in the previous case, the system first searches for the 350 boxes in the picking area but because of the large amount is "turned away". Next, the system searches for the materials in bulk storage. With optimization, the system rounds the required amount down to the next full storage unit. In this case, the system selects **three** full pallets with a total of 300 boxes (instead of four pallets to include all 350 boxes).

For the remaining 50 boxes, the system "begins the search again" for the required materials. Therefore, the system looks first in the picking area to see if the remaining 50 boxes are available there.

This procedure prevents the system from creating partial pallets unnecessarily and provides optimal management of the picking area.

Storage Unit Documents

For transactions involving the movement of storage units, you can print four different documents:

- **Transfer order document**

  The transfer order (TO) document is the same document that can be printed in the existing system without using SU management. This document displays information about a **single item** for the movement of a material in a storage unit. If there are several items in a transfer order for a storage unit, a separate TO document is printed for each item. This document displays a bar code, the date it was created and source and destination storage bins.

- **Storage unit contents document**

  This document provides a list of the contents and quantities of all the materials in a storage unit. The storage unit number is printed in both numerical and bar code formats.

- **Storage unit document**

  The storage unit (SU) document displays several sections with the same SU number in numerical and bar code formats. This document can be used to support your administrative processes. For example, when you need to note the SU number for a storage unit, you can tear off a small section of the SU document for scanning or other administrative purposes.

- **Storage Unit / Transfer Order Document**

  The SU/TO document displays information about the movement of an entire storage unit.

You can print storage unit documents manually or you can set up your system to print them automatically.

Printing SU Documents Automatically

The *Warehouse Management IMG* documentation provides instructions on how to configure your system to print SU documents when executing various transactions.

There are three situations when printing storage unit documents is meaningful.

- when creating storage units

- when transferring complete storage units

- for stock removals

Each situation involves the creation of a transfer order. The document that the system prints depends upon the transaction that is carried out.

SU Documents that You Can Print Automatically

Transaction	Document Printed

Create Storage Unit	Transfer Order Document
	Storage Unit / Transfer Order Document
	SU Document (with perforated rip sheet)
	Storage Unit Contents Document
Transfers (Create TO for SU)	Transfer Order Document
	Storage Unit / Transfer Order Document
	Storage Unit Contents Document
Partial Stock Removals	Transfer Order Document
Complete Stock Removals	Transfer Order Document
	Storage Unit / Transfer Order Document
	Storage Unit Contents Document

Printing SU Documents when Creating Storage Units

When you create storage units, on the transfer order preparation screen you can manually control whether the SU contents document will be printed or not.

The system automatically selects the *Print SU contents* field on the preparation screen when you create transfer orders. This means that the SU contents document will be printed when you post the transfer order to the database. If you deselect this field, the system will not print the SU contents document. This prevents the unnecessary printing of a document which will become obsolete soon after it is printed.

> You have a partial pallet in the goods receipt area onto which you plan to add more material items.
>
> You may decide to deselect the *Print SU contents* field on the transfer order preparation screen because you know that the SU contents document for the storage unit will no longer be valid within a short time. When you add stock to the existing storage unit, you can then select this field to print the actual contents of the storage unit when you post the transfer order to the database.

Printing SU Documents Manually

This topic describes how you can print storage unit (SU) documents for a specific storage unit manually.

Procedure

1. Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order and Other Transactions → Print and Communication → Transfer Order for Storage Unit* from the SAP menu.

2. As a minimum, you must enter the storage unit number and select at least one of the four fields at the bottom of the screen (*Document Selection*).

   You can print one, two, three or all four of the storage unit documents listed.

3. Fields are also provided for print codes, spooling control data and the selection of a specific printer. Choose *Print* from the application toolbar to print the document(s) selected.

4. *Choose Print from the* pushbutton section in order to print the selected document(s).

In addition to the print function for manual printing of entire transfer *orders (Print and Communication → Single Print Transfer Order)*, the selection option also contains the "*Document Selection*".

See also:

Transfer Order and Label Printing [Page 166]

Storage Unit Preplanning

Use

Using SU management, it is possible to preplan storage units.

When you preplan storage units, you create and store data about storage units in the application component Warehouse Management (WM) in advance, that is, before these actually arrive in the warehouse. When these storage units are physically received in the warehouse, you can then identify them based on their storage unit numbers and then put them away. No manual input is required other than scanning the SU numbers.

Prerequisites

It is important to realize that the preplanning of storage units is nothing more than creating transfer orders at an earlier point in time.

Therefore, the following conditions apply:

- When you preplan storage units, it would make no sense to confirm these transfer orders immediately.

- The system will only assign SU numbers if you create transfer orders to move stock into an "SU-managed" storage type.

- When you create transfer orders using the preplanning function, the system suggests storage bins in the normal manner. If you have configured your system to search for physical storage bins (for example, in high rack storage) these bins will be blocked for putaways when you preplan the storage units. It is better therefore if you set up your system so that the storage units are first assigned to an ID point.
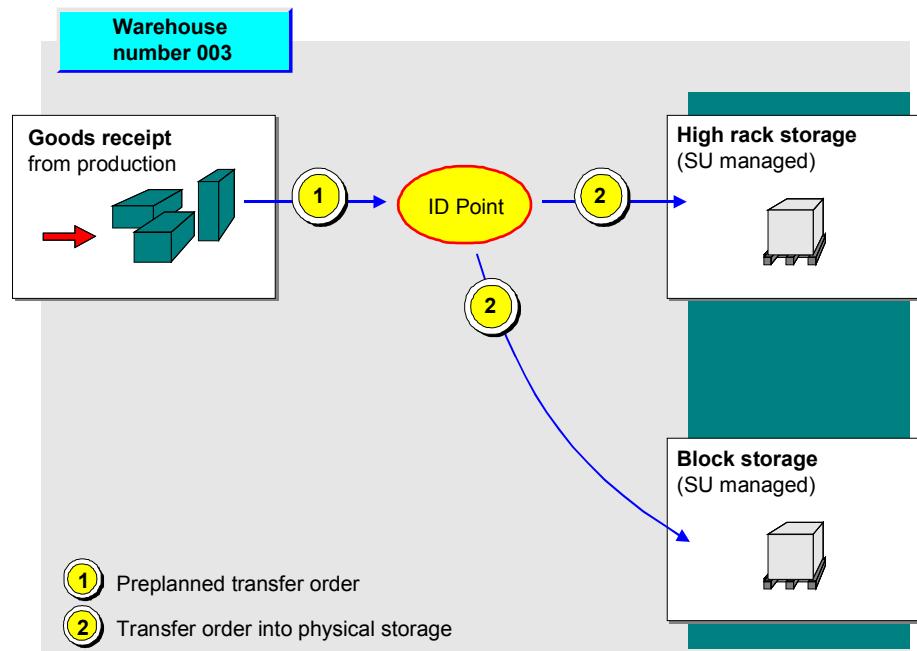
  You can create a separate ID point as a "goods receipt point for preplanned storage units". Since an ID point (a storage type with stock putaway strategy Q) assigns dynamic storage bins, it is possible to "store" any number of preplanned storage units at that ID point.

We recommend that you create your own WM movement types for preplanned activities so that the points above can be adhered to.

Activities

SU documents are printed when you preplan storage units. You can then pass these documents to the location where the storage units are produced in advance. There, they can be attached to the corresponding storage units.

Storage Unit Preplanning

Warehouse
number 003

Goods receipt
from production

1

ID Point

2

High rack storage
(SU managed)

2

Block storage
(SU managed)

1 Preplanned transfer order

2 Transfer order into physical storage

1. When transfer orders are preplanned, the storage units are first transferred from the goods receipt area for production to an ID point.

2. When the storage units physically arrive at the ID point, the transfer order items are confirmed and a second transfer order is created to move the storage units into the final storage type.

Preplanning Storage Units via an ID Point

Procedure

To preplan storage units

1. Choose *Logistics → Logistics Execution → Inbound Process → Goods Receipt for Purchase Order, Order and Other Transactions → Putaway → Create Transfer Order → Preplan Storage Units* from the SAP menu.

2. For a production order, as a minimum enter the

   – Warehouse number

   – Planned execution date

   – Movement type

   – Requested quantity

   – Material number

   – Plant

   Choose *Preparation*.

3. Enter or modify information on the preparation screen as desired.

4. Choose *Putaway foreground.* or *Create TO in background.*

   The system assigns storage unit numbers and destination storage bins.

   🔦

   You can set up the system to assign dynamic storage bins (quant numbers) in an ID point storage type. You can also manually enter the ID point storage type in the *Palletization* section of the preparation screen.

5. Post the transfer order to the database (and print the storage unit documents predefined for your system).

Receiving Preplanned Storage Units

In production, the storage units are created and preprinted SU documents are attached to the corresponding storage units. In WMS you "receive" the storage units which have physically arrived using the transaction *Put away storage unit*.

The manual process is as follows:

1. Choose *Logistics* → *Logistics Execution* → *Internal Whse Processes* → *Stock Transfer* → *Create Transfer Order* → *Move Storage Unit* from the SAP menu.

2. On the initial screen, enter the storage unit number and movement type.

   For preplanned transfer orders with open items, a dialog box will appear which asks if you want to confirm the open items for the storage unit.

   When you choose *Yes*, the system displays the confirmation screen.

3. If there are no differences, choose *Confirm internally* from the application toolbar to confirm the transfer order item and *Transfer order* → *Post* from the menu bar to post it to the database.

   Since you chose the function *Create Transfer Order for Storage Unit* in step 1 above, the system displays the preparation screen for putaway.

From this point, you create a new transfer order to move the storage unit to the ID point and then to the final storage type in the normal manner.

4. To create a new transfer order for the storage unit, choose *Create trans.order*.

   Based on the movement type definition and/or manually entered data, the system selects a destination storage bin and completes the transfer order preparation screen.

5. Post the new transfer order to the database.

Handling Differences for Preplanned Storage Units

There are two situations in which differences can occur for preplanned storage units.

- Normal differences are differences in which part of the materials in a storage unit are missing.

- When less than the total preplanned expected storage units arrive in the warehouse, a reorganization report processes these "missing" storage units to clear the system of preplanned unused transfer order items.

"Normal" Differences

If a normal difference occurs, enter this information into the system when confirming the preplanned transfer order after completing step 2 described in "Receiving Preplanned Storage Units" above. (For step 3, if there are differences, mark the *D* column and choose *Confirm*.)

Reorganization of Preplanned Storage Units

As an example, let us assume that, although you preplanned 10 storage units, only 8 arrive in the warehouse.

Since only 8 of the 10 storage were actually placed into storage, the remaining 2 storage units must be cleared from the system. To do this, you use a report that deletes unused storage units created using the preplanning function.

Choose *System → Services → Reporting* from the WM menu bar and enter **RLVSPLRE** in the *Report* field.

When you start the report, the screen for the reorganization of planned transfer orders is displayed.

On this screen, you enter the warehouse number and validity period. In the *Validity period* field, you enter the number of days **from the planned execution date** that transfer order items are to remain valid. Transfer order items that are still open after the validity period has been exceeded are canceled.

Example

For example, if the planned execution date is September 1, 2000, and the validity period is defined as 2 days, open transfer order items are automatically canceled on September 3, 2000.

Blocking Storage Units

If you want to bulk storage units from movements within the warehouse, you can block individual storage units for both putaways and picks.

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Bins and Stock → Display → Single Displays → Storage Unit* from the SAP menu.

2. Enter the SU number in the *Storage unit* field, then choose *Storage Unit → Change,* and `ENTER`.

3. To block the storage unit for putaway or picking, select the *Putaway block* or *Pick block* field.

    To explain why the storage unit is blocked, you can also enter a code in the Blocking reason field.

4. Save the change to the database.

Multiple Processing for SU Management

When you post a transfer order to remove a specific quantity of material from a storage unit, the remaining materials on that storage unit are blocked from removal by other transfer order items.

The exception to this is when you use the multiple processing function. Using multiple processing, you can remove stock from a storage unit using several transfer orders. The only condition is that these transfer orders must belong to the same multiple processing group.

See also:

Posting a Goods Receipt Based on a Purchase Order [Page 200]

Inventory

The practice of taking an annual inventory count at the end of the fiscal year often requires an enormous effort for large warehouse complexes. The costs to a company are relatively high, and the physical counting process in the warehouse is labor intensive. In many factories, an annual inventory count would result in lost output because of the effort required. Therefore, several variations to the conventional annual inventory count are allowed by law under certain circumstances.

The SAP Warehouse Management (WM) application supports the following inventory methods:

- Annual inventory count (also called periodic inventory)

- Continuous inventory

- Continuous inventory during stock placement

- Continuous inventory based on zero stock check

- Cycle counting

- Inventory sampling

> For information about the inventory sampling method, see MM Inventory Sampling documentation. All other methods are described in this section.

For a storage type, you can define either an annual or a continuous inventory count. You can also select one or more of the other types of inventory methods, such as an inventory based on stock placement or based on stock removal (zero stock check).

Unlike the material-related inventory in the Inventory Management (IM) application component, you use WM to carry out an inventory on a storage bin level for the warehouses managed in WM. The inventory is regarded as completed if an inventory was taken for every storage bin in the warehouse at least once during the fiscal year.

Choosing an Inventory Method

Since storage bins and stock movements of materials are continuously monitored in WM, the technical prerequisites are in place to support the continuous inventory method. With WM you can define a different inventory method for each storage type, for example, high rack storage has continuous inventory during stock placement while bulk storage has an annual inventory. Some of the inventory methods supported by WM are subject to legal restrictions, while other methods cannot be implemented for technical and/or organizational reasons. Inventory methods must always be decided by the inventory specialist in conjunction with the company's auditors.

The description of the inventory methods in this guide refer only to the technical prerequisites that are necessary to set up and carry out the different inventory methods. The notes mentioned here are not complete. They can be used only to supplement and check the company-specific inventory requirements.

Checking the Inventory Status

To check whether inventory has been taken at least once during the fiscal year, choose *Physical inventory → Evaluations → Inventory status* from the WM menu bar.

Results of an Inventory in WM

After an inventory has been taken in WM, inventory data is stored for both the storage bin and the quant, if applicable. An indicator that identifies the inventory method is set. To access this information, choose *Physical inventory* → *Inventory history* from the WM menu bar.

The system records inventory differences, if any, in an interim storage area for differences, from where they are recorded in IM and automatically cleared from the interim storage area in WM.

See also:

Controlling the Inventory Process [Page 457]

Controlling the Inventory Process

There are several objects that the system uses to control the inventory process. How you maintain the objects to define is described below.

- Inventory list parameters

- Movement types for differences

Inventory List Parameters

These parameters control what is printed on the warehouse inventory list and what is displayed on the screen for entering the results of the inventory count.

To define the inventory list parameters, see the section on defining default values under *Activities → Inventory* in the *Warehouse Management IMG* documentation.

In the table displayed you enter all storage types for which you want to carry out an annual inventory or a continuous inventory. For each storage type you define the parameters for the layout of the data entry screen for inventory results and the format of the printed warehouse inventory list. For example you decide whether the inventory list should include the material number or if the system should issue a warning message when the difference between the counted amount and the book amount deviates by a specified percentage or monetary value.

Movement Type for Inventory Differences

In WM inventory differences are posted to a interim storage area for differences. This interim storage area for inventory differences is determined by the WM movement type. For positive and negative inventory differences, movement types must be assigned to a warehouse.

To assign movement types in the warehouse number record, see the *Warehouse Management IMG* documentation.

After differences have been identified and collected in the interim storage area, they must be recorded in the IM component. This process is carried out using IM movement types.

To assign IM movement types to your warehouse, see the section on clearing differences under *Activities → Inventory* in the *Warehouse Management IMG* documentation.

In the table of IM movement types for clearing inventory differences, you enter a

- Stock category (such as inspection stock or returned stock, if appropriate)

- Movement type for positive differences (*Post invent. difference* field)

- Movement type for negative differences (*Clear invent. difference* field)

Both movement types point to an interim storage area (such as 999 Interim Storage Type for Differences in the standard system) with dynamic coordinates.

Deviation in Monetary Values

You can select monetary currencies from several countries and enter actual monetary values in addition to entering percentage values as a threshold for data calculation and the display of inventory record items in Warehouse Management (WM). This is possible when you

- Process inventory recounts

- Clear inventory differences

- Display the inventory evaluation difference list

WM uses these entries to calculate the value of stock inventoried to check whether or not the monetary deviation exceeds the threshold. Monetary deviations are differences in value between the counted quantity and the book quantity. If the system cannot calculate a deviation in value (for example, for non-valuated returned stock), it displays an appropriate message.

When you display the inventory evaluation difference list, the system displays a list of the items in system inventory records for which there is a deviation that exceeds the percentage or monetary value you enter on the initial screen of this report. Since this function uses the general list viewer, you can decide which fields you want to display on the screen for this evaluation. These include:

- Relative deviation for each storage bin

- Deviation with comments

- Deviations in value (summable)

See also:

Processing Inventory Differences in WM [Page 466]

Stock Differences [Page 185]

Take Continuous Inventory

Purpose

With the continuous inventory method, you take inventory for a certain number of storage bins in a storage type. The inventory can take place at any time during the fiscal year.

Continuous inventory has the following advantages over the annual inventory count at the end of the fiscal year:

- The effort and costs for the inventory is not concentrated on a certain day or days but is distributed over the entire year. This means that the warehouse supervisor can plan the workforce needed for the workload in the warehouse more accurately.

- Inventory can be conducted during slow times in the warehouse, such as during summer vacation periods.

- With a reduction in the effort required at the end of the fiscal year, you can respond better to problems that might arise during a year-end closing.

- When an inventory is carried out on a continuous basis, up-to-date information about the correspondence between the warehouse stock and the book inventory is always available.

Prerequisites

Inventory methods are defined for each storage type. To define a continuous inventory for a storage type, see *Activities → Physical Inventory → Define Types per Storage Type* in the Warehouse Management section of the Implementation Guide (IMG) documentation*.

Process Flow

To run a continuous inventory, you need to complete the following steps in the order displayed:

1. Plan the inventory by selecting storage bins [Page 461], for which you want to take inventory.

2. Create the system inventory record [Page 462]

3. Activate the system inventory record [Page 463]

4. Print the warehouse inventory list [Page 464].

5. Take physical inventory in the warehouse.

6. Enter the inventory results [Page 469]

7. Close the inventory [Page 465]

8. Process differences [Page 466] in Warehouse Management (WM) and record them in Inventory Management (IM).

See also:

Using Batch Input for Inventory Count Results [Page 471]

Selecting Storage Bins

> When selecting storage bins for inventory, you can only select storage bins for which there are no open transfer orders.

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Physical Inventory → In Warehouse Management → Physical Inventory Document → Create → Continuous Inventory* from the SAP menu.

2. On the initial screen you must enter the warehouse number and storage type. You have several possibilities for selecting storage bins. In the second section of the screen there are selection criteria fields that you can use to control the extent of the inventory.

3. Choose *Program → Execute* to continue processing.

   The system displays a list of all the storage bins that you selected. By default the list is sorted by the number of quants. You can also sort the list by date or by storage section. The system has selected all storage bins the marked for further processing. You can use the tasks in the *Edit* menu to select and deselect the storage bins.

Creating the System Physical Inventory Document

Once you have selected the storage bins for the inventory, you must create the physical inventory document. To do so, choose *List* → *Create documents* from the menu bar of the list screen when you select the storage bins.

The system issues a message that the inventory document has been created and places an asterisk in the first column.

What Happens in the System?

- The *Inventory planned* indicator for the storage bin is set. At this point the storage bin is not blocked.

- The *Inv.status* field in the header of the physical inventory document is set to N, not counted.

Activating/Changing the Physical Inventory Document

Before you can continue with the inventory you must activate the physical inventory document. However, this can be done only when there are no open transfer order items for the storage bins in the physical inventory document. In other words, all transfer orders for the storage bins must be confirmed.

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Physical Inventory → In Warehouse Management → Physical Inventory Document → Change* from the SAP menu.

2. On the initial screen enter the warehouse and the number of the physical inventory document. Then choose ENTER.

3. To activate the inventory document, choose *Inventory document → Activate*.

    The system returns to the initial screen with a message that the inventory document has been activated.

In the change task for the physical inventory document you can also add new items to the physical inventory document (new bins to be inventoried) or delete items from the physical inventory document.

    You can create and activate the physical inventory document in a single step. On the screen that lists the selected storage bins, choose *List → Activate* (instead of *List → Create*).

What Happens in the System?

* The *Inventory active* indicator for the storage bin is set.

* The storage bin is blocked for all movements.

* The *Inv.status* field in the physical inventory document has not changed (set to N).

* The *Inventory active* indicator in the physical inventory document is set.

Printing the Physical Inventory Document

To print the physical inventory document

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Physical Inventory → In Warehouse Management → Physical Inventory Document → Print Whse Inventory List* from the SAP menu.

2. On the initial screen enter the warehouse number, the number of the physical inventory document, and a printer ID.

    If you only want to display the inventory list on the screen, deselect the *List* field.

3. To continue, choose ENTER.

    You set the parameters for printing the physical inventory document in *Customizing* for Warehouse Management under *Logistics Execution → Warehouse Management → Activities → Physical Inventory → Define default values*.

Closing the Inventory

To complete the inventory process in WM, you must clear the inventory and unblock the storage bins. These two steps can be done with a single task. You also use this task to process any differences between the counted results and the quantity that was actually in the storage bin.

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Physical Inventory → In Warehouse Management → Physical Inventory Document → Overview* from the SAP menu.

2. On the initial screen you must enter the warehouse number and at least one of the selection criteria. Choose *Program → Execute* to continue.

   The system displays a list of physical inventory documents that meet the selection criteria. For example, you can select all inventory documents in a storage type for which the inventory items are "partially counted".

   From this list you can select the desired inventory document or documents for further processing.

3. Select the desired documents and choose *Environment → Clear documents* from the menu bar.

   The system goes to the task for processing differences in WM. All the storage bins for the selected physical inventory document are displayed.

4. Select the bins you want to process and then choose *Clear*.

   The system returns to the list of physical inventory documents with a message giving the number of storage bins that were cleared.

What Happens in the System?

- The *Inventory active* indicator in both the storage bin and the physical inventory documents is set to blank, which means that no inventory is planned or is taking place.

- The storage bin is unblocked.

- The inventory data in the storage bin is updated.

- The *Inv.status* field in the physical inventory document is set to L, which means that the inventory has been cleared in WM.

At this point, if there are no differences, the inventory process is complete. However, when differences are found between the counted amount and the book inventory, they must be processed in WM. The book inventory must be updated in both WM and IM.

Processing Inventory Differences in WM

When you enter the results of the inventory count, you inform the system that there are differences between the counted amount and the book inventory. You record these differences in WM to reflect the actual stock in the storage bins. At the same time negative and/or positive bin quantities are also recorded on the interim storage area for differences. These differences must be cleared from the interim storage area and posted in the Inventory Management (IM) component.

Process

The following steps are a suggestion of how you can use the tasks within WM to process differences.

1. Enter inventory results with a difference between the counted amount and the book inventory.

   When you enter the inventory results in WM and there is a difference between the counted amount and the book inventory, the system issues a message that warns you about the difference and displays a window. While processing inventory differences in WM, this step gives you a chance to change the amount you entered in case you entered the amount incorrectly. WM also gives you the opportunity to perform a recount of materials in the storage bin.

2. Display a list of the differences.

3. Carry out a recount of the item or items in the system inventory record for which the differences are improbably high.

4. Reprint the warehouse inventory list and recount the storage bins in the warehouse.

5. Enter the results of the recount.

6. Close the inventory.

7. Clear differences from WM and record them in the IM component.

Displaying a List of Inventory Differences

If you feel that differences should be investigated, you can request a recount of the bins. To find out where the differences are:

1. Choose *Physical inventory* → *Evaluations* → *Difference list* from the WM menu bar.

2. On the initial screen specify the warehouse and the storage type. Choose *Program* → *Execute*.

   The system displays a list of the items in system inventory records for which there is a difference between the counted amount and the book inventory.

Recounting Inventory Results

You need to indicate which system inventory record items are going to be recounted.

1. Choose *Physical inventory* → *Count result* → *Recount* from the WM menu bar.

2. On the initial screen you must enter the warehouse number and the system inventory record. Additionally, you can enter a percentage or monetary value as a deviation threshold on this screen. Choose ENTER to continue.

Processing Inventory Differences in WM

> The system displays a list of items in the system inventory record.

3. From the list, select the storage bins for which you want to carry out a recount. Choose *Recount* → Start recount to start the recount.

> The system issues a message that a recount was created for the selected items in the system inventory record. A version number is assigned to the recount.

The *Inv.status* field in the system inventory record is reset from Z (counted) to A (count incomplete). The system cancels the setting of the *Print completed* indicator in the system inventory record.

Reprinting the Warehouse Inventory List

To reprint the warehouse inventory list

1. Choose *Physical inventory→ Inventory document → Print* from the WM menu bar.

2. On the initial screen be sure to enter the version number of the recount, in addition to the warehouse number and system inventory record.

> Choose *Continue*.

> The system sets the *Print completed* indicator in the system inventory record.

Entering the Results of the Recount

To enter the results of the recount

1. Choose *Physical inventory → Count results → Enter* from the WM menu bar.

2. On the initial screen, be sure to enter the version number of the recount, in addition to the warehouse number and system inventory record. Choose *Continue*.

3. On the data entry screen, you enter the results of the recount in the Counted qty column.

4. To post the results to the data base, choose *Inventory count → Post*.

> The system resets the *Inv.status* field in the system inventory record from A (count incomplete) to Z (counted).

For complete information about entering results, see Entering the Inventory Results in WM [Page 469].

Closing the Inventory with Differences

To close an inventory with differences, you use the same task that is described in Closing the Inventory [Page 465]. After you have selected the bins that you want to clear and have chosen *Environment → Activate documents* (see step 4 in Closing the Inventory), the system issues a message that displays the number of the transfer order that it created to post the difference.

In addition to creating a transfer order, the system updates the status in the system inventory record. The inventory data in the storage bin record is updated and the storage bin is unblocked. If you display the transfer order, you see that a quantity of material (the difference between the counted amount and the book inventory) is transferred from the interim storage area for differences and placed into the storage bin in which the difference was found.

Clearing Differences

To clear the inventory differences from the interim storage area in WM and to post the differences in IM:

1. Choose *Physical inventory* → *Clear differences* → *Warehouse Management* from the WM menu bar.

2. Enter the system inventory record number on the initial screen, choose *Display list* and then *Differences* → *Clear* from the list displayed.

   If all items have not been counted in the system inventory records, you may need to exit this function and count the stock in the storage bins concerned before continuing.

3. Choose *Physical inventory* → *Clear differences* → *Inventory management* from the WM menu bar.

4. On the initial screen enter the warehouse number and interim storage type for inventory differences (999 in the standard system). You have several possibilities to specifically identify the storage bins with inventory differences. To continue choose *Program* → *Execute*.

   The system displays a list of differences, which are ready for further processing.

5. Select the bins you want to clear and choose *Clear* (on the *Applications toolbar*) or *Save* to clear the differences.

   The system displays a list with the material documents that were created. If the program is executed without errors, you can branch to the detail list by selecting (clicking the mouse on) a material document number. If there are errors, the system lists the errors that occurred.

Lot Numbers

When you clear inventory differences in Inventory Management, the system also takes stock with lot numbers into consideration. When you use this function, the quantity in the inspection lot is adjusted accordingly.

Instead of clearing excessive quantities with an inspection lot during inventory counting in Inventory Management, these quantities are added to the existing inspection lot. The system does not create a new inspection lot.

See also:

Entering the Inventory Results in WMS

Once the inventory list has been printed, the warehouse worker can begin the physical inventory count in the warehouse. The warehouse worker enters the counted results in the column provided in the list. After the warehouse worker has entered the counted results on the inventory list, you can enter these results in the system.

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Physical Inventory → In Warehouse Management → Count Results → Enter* from the SAP menu.

2. On the initial screen, enter the warehouse number, the warehouse inventory list number, and the date of the inventory.

> As an option, you can also enter the **name of the person taking inventory** on this screen. The system then copies this name into the item counted. The system only displays the name on the two-line display.
>
> If the count data is loaded into the system using IDoc WMIVID01, the Name is taken from the new IDoc field.
>
> If you work synchronously with mobile data entry (MDE) scanning devices that function as remote terminals, the system copies the name used when logging on into the field.
>
> For recounts, the name can be overwritten with a new name. When you change an inventory count document, the system only changes the name when the quantity in the corresponding item is changed.

   Choose ENTER.

3. On the data entry screen you enter the counted results in the *Counted qty* column. You can define the format of this screen and the data that it contains in the inventory list parameters. See under *Logistics Execution → Warehouse Management → Activities → Physical Inventory → Define default values* in the *implementation Guide (IMG) for Warehouse Management IMG* documentation for more information about this topic.

   If a storage bin is designated as empty and the counted result shows no stock, you can select the item in the *E* column. In this way you confirm that the storage bin is actually empty.

   If a storage bin is designated as empty but the counted result shows a quantity, enter the material and the quantity counted.

   If a storage bin has more bin quantities than are listed in the data entry screen, choose *Edit → New Entries → List* or *Individual* to add the material and quantity.

   If you enter a counted amount that is different than the book amount, the system may display a message and a difference window, depending on the size of the difference.

4. Post the results of the inventory count to the data base.

   The system issues a message that the counted results were created in the system for the specified system inventory record.

What Happens in the System?

The *Inv.status* field in the system inventory record is set to Z, which means that the inventory count has been completed. An inventory can also have the status of A, which means that the count has been started but not completed (such as in the case of a recount). All other statuses related to the inventory for the storage bin and in the system inventory record are unchanged.

See also:

Using Batch Input for Inventory Count Results [Page 471]

Using Batch Input for Inventory Count Results

When entering inventory count results, you can enter all information on a single screen without using dialog boxes. This makes it possible to enter count results using batch input (screen sequence: 201, 202, 202....). If not all count results are entered, the dialog box that appears when you save data is suppressed during batch processing. This way, the program that creates the batch input file does not have to take into consideration whether all the data necessary for a particular screen has been entered or not.

> If you process data in an external system and then want to load it into the SAP System, you must write a program that transfers this data in batch input format to the corresponding SAP transaction Li11.

Manually, the process is carried out in WM as follows:

1. After you create and activate an Inventory record, choose *Logistics → Logistics Execution → Internal Whse Processes → Physical Inventory → In Warehouse Management → Count Results → Enter* from the SAP menu.

2. Enter the mandatory warehouse number, inventory record number and count date and choose *Single record entry*.

3. Enter the material and count data and choose ENTER.

4. After you make the last entry, save the count results.

Take Annual Inventory

Purpose

You use this inventory method for storage types, for example, for which the continuous inventory method should not be used. You can also use this method to take an inventory of the storage bins and bin quantities that are normally subject to a continuous inventory method but had no movement in the current fiscal year.

Prerequisites

Inventory methods are defined for each storage type. To define annual inventory for a storage type, see *Activities → Physical Inventory → Define Types per Storage Type* in the Warehouse Management section of the Implementation Guide (IMG).

Process Flow

To carry out annual inventory, complete the following steps in the order shown:

1. Complete and confirm outstanding transfer orders.

   All outstanding transfer orders must be completed and confirmed before inventory can be taken for the storage bins involved. To display transfer orders by storage type to determine which orders are outstanding, choose *Transfer order → Display → By storage type.* Using this display task, you can confirm any open transfer orders that may exist in a storage type.

2. Block the affected storage types.

3. Select the storage bins.

4. Create and activate the system inventory record

5. Print the warehouse inventory list [Page 464].

6. Take physical inventory in the warehouse.

7. Enter the results [Page 469] of the inventory count in WM.

8. Process differences [Page 466] in Warehouse Management (WM) and record them in Inventory Management (IM).

9. Unblock the storage types.

Blocking storage types

In the warehouse where annual inventory is being taken, all the storage types involved should be blocked for all movements. When the inventory is closed, all the blocked storage types must be released so that they are available for putaway and picking.

To block or unblock storage types, choose *Inventory → Block storage type* from the WM menu bar. For each storage type that you select, you can select or deselect the blocking indicators for both putaway and picking. You can also specify a blocking reason.

Selecting storage bins for annual inventory

In this step, you determine the storage types and/or storage bins for which you want to take inventory. Due to the potentially large volume of data that the system must process, this task

Take Annual Inventory

always results in the creation of a batch session. The system activities involved in creating and activating the system inventory record are done in batch mode.

1. Choose *Physical Inventory → In Warehouse Management → Physical Inventory Document → Create → Annual inventory* from the SAP Easy Access menu.

2. On the initial screen, enter the warehouse number and the storage type. The system proposes the inventory date and the batch session name. Choose *Execute* to continue.

   The system displays a screen that summarizes information about the storage bins in the storage type. This screen includes information about the number of storage bins, the number of bins for which an inventory is already activated, the number of bins that are available for inventory, and the number of bins that are selected for the inventory. Storage bins that cannot be inventoried are listed below the summary information.

Create and activate the system inventory record

From the information screen displayed by the system when you select storage bins for annual inventory, you have several processing options, which depend on the settings of the two indicators on the initial screen.

- If the *Log only* indicator is selected on the initial screen, the system goes to the information screen, as described above. From the information screen you can:

  - Create the system inventory record by choosing *Physical inventory document → Post*. After outstanding transfer orders have been completed and confirmed, activate the system inventory record and then create the batch-input session. Use this option when outstanding transfer orders are listed on the information screen.

  - Create and activate the system inventory record by selecting *Physical inventory document → Activate* from the menu bar. The system issues a message that the batch input session was created.

- If the *Activate inventory list* indicator on the initial screen is selected, the system goes to the information screen, as described above. However, the system also issues a message that the batch input session has been created.

Once the batch input session has been created, it must be must be started manually. To do so, choose *System → Services → Batch input → Sessions* from any menu bar. After the system inventory record has been processed, you can print out the warehouse inventory list and continue the inventory process.

> Since several inventory documents are generally created due to the large volume of data, we recommend that you always assign a group number. You can then select from the summary list of system inventory records using the group number.

See also:

Using Batch Input for Inventory Count Results [Page 471]

Executing the Cycle Counting Inventory Method

Purpose

Cycle counting in the Warehouse Management (WM) application component makes it possible for you to separate materials into classes (such as A, B, C...) and take inventory for each class separately several times throughout the year.

Prerequisites

Before implementing cycle counting, you must make the following changes to your system:

1. See the section on "Cycle Counting" under *Physical Inventory* in the *Inventory Management IMG* documentation to define the cycle counting indicators (material classes) and the number of times per year that inventory counts are to be taken for each material class.

2. Enter the cycle counting indicator (for example, A, B or C) into the "Storage" view of the material master record for each material that will be counted using the cycle counting task.

3. Under the path *Activities → Inventory → Define types per storage type* section of the *Warehouse Management IMG*, change the *Inventory* data field to CC (cycle counting) for the storage types where cycle counting is to be implemented.

   When using cycle counting, the system only suggests materials within a storage type that are marked with a cycle counting indicator. In order to take inventory for the rest of the materials (that is, the materials that do not have a CC indicator) for a storage type, the " Inventory method" data field must be changed temporarily to " PZ". Afterwards, you can perform standard continuous inventory in IM. (See step 3 above).

Process Flow

To implement cycle counting in WM, you need to carry out the following steps in the order shown:

1. Create a warehouse inventory list and activate the inventory documents.

   To create a warehouse inventory list using the cycle counting inventory method

   a. Choose *Physical Inventory → Physical Inventory Document → Create → Cycle counting* from the WM menu bar.

   b. Enter the warehouse number, storage type, and the time interval (in the *"Inventory Period"* field) for the inventory. Choose *Execute*.

      The system proposes a series of storage bins for physical inventory. All bins where inventory can be performed are selected.

      If one of the quants in a bin is blocked, the storage bin is displayed with the remark "blocked" but is not selected for the inventory.

      If you have mixed storage, all quants are checked and proposed whenever only one of them has a valid cycle counting indicator. Also, the remark "several quants" appears.

Executing the Cycle Counting Inventory Method

> If desired, you can sort the proposed bins by date. You can also display one of the storage bins by choosing *Environment* → *Display storage bin.*
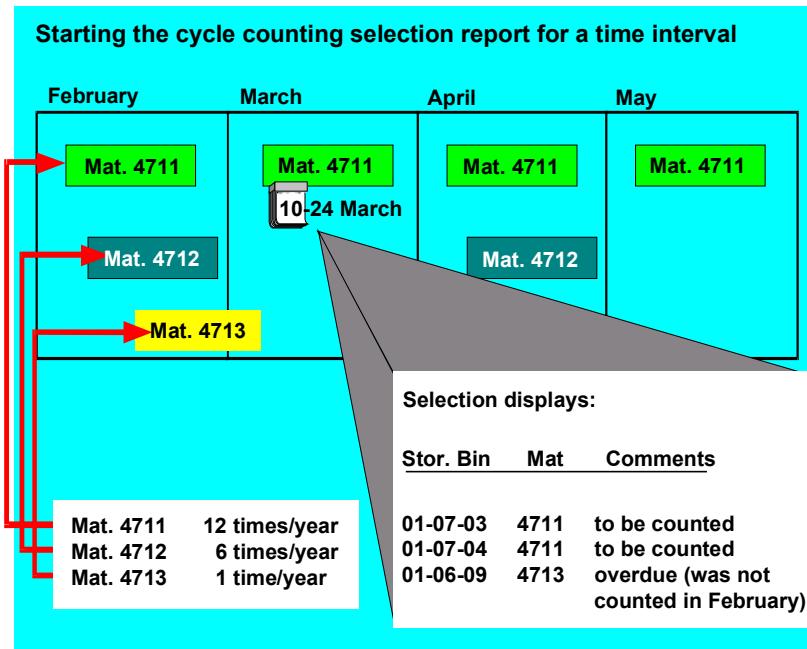
2. Print the warehouse inventory list [Page 464].

3. Take the physical inventory count in the warehouse.

   To plan the inventory count for the suggested bins, choose *List* → *Create documents*.

   To activate the inventory documents immediately, choose *Activate documents*.

   See also:

   Using Batch Input for Entering Inventory Count Results [Page 471]

4. Entering Count Results [Page 469]

5. Closing Inventory [Page 465]

6. Process differences [Page 466] in WM and record them in IM.

Starting the cycle counting selection report for a time interval

February	March	April	May
Mat. 4711	Mat. 4711	Mat. 4711	Mat. 4711
	10-24 March		
Mat. 4712		Mat. 4712	
Mat. 4713			

Mat. 4711	12 times/year
Mat. 4712	6 times/year
Mat. 4713	1 time/year

Selection displays:

Stor. Bin	Mat	Comments
01-07-03	4711	to be counted
01-07-04	4711	to be counted
01-06-09	4713	overdue (was not counted in February)

This report searches for all materials in a storage type that are marked for cycle counting within a given date interval, and it creates a list of storage bins for which inventory is to be taken.

Cycle Counting at Quant Level

Use

It is possible to execute cycle-counting inventory at the quant level. With this inventory procedure, you perform physical inventory for materials at regular intervals within a fiscal year. The time intervals depend on the cycle-counting indicator set for the material. Materials can be divided up into certain categories that are inventoried independently of one another several times during the year. With the cycle-counting method, for example, you can have common materials inventoried more often than materials that are not so common. Particularly with valuable materials, it is important to perform inventory in short intervals. Up to now, if you used the cycle-counting procedure, inventory was basically performed on a bin basis. The system determined automatically on which storage bins the materials to be counted were stored and included these bins in a physical inventory document.

Integration

The cycle-counting procedure at quant level is based on the existing cycle-counting functions available.

Prerequisites

In addition to the settings required for the cycle-counting procedure, you must also assign a number range interval (an existing one or a new one) to the quant inventory in the Implementation Guide under the path Maintain Number Ranges [Ext.] (*Logistics Execution → Warehouse Management → Activities → Physical Inventory → Maintain Number Ranges).*

Features

It is possible to execute cycle-counting inventory at the quant level. In this case, only the quants of the respective material are blocked for the period of the actual inventory counting. This is particular appropriate for storage bins with mixed storage:

- Only the selected materials need to be counted.

- Only the respective quants, not the storage bins, are counted.

- In the case of materials that are not set in the physical inventory document for the cycle-counting procedure, there must be no open transfer orders, nor can transfer orders be created during the inventory count.

The inventory data in this procedure is stored at the quant level. To create physical inventory documents for using the cycle-counting procedure quant by quant and to execute an evaluation, there are two new reports at your disposal: "Evaluation of Quant Inventory" (*Logistics Execution → Internal Whse Processes → Information System → Warehouse → Physical Inventory → Evaluation of Quant Inventory)* and „Execution of Physical Inventory Using the Cycle-Counting Procedure Quant by Quant (*Logistics Execution → Internal Warehouse Processes → Physical Inventory → In Warehouse Management → Physical Inventory Document → Create → Cycle Counting → Cycle Counting per Quant).*

For more information, refer to the documentation of the reports RLINV060 and RLINV070.

For cycle counting at quant level, you can create a new number range interval.

Cycle Counting at Quant Level

Note that, when you move a quant from one bin to another, the quant in the source bin is deleted and a new quant is created in the destination bin. In this case, the information on the quant inventory is lost since this is stored at quant level, not at bin level.

When you create physical inventory documents, these are created as active during the cycle-counting procedure at quant level. There is no intermediate step as for the inventory procedure at bin level. It is therefore not possible to create documents and then to activate these, for example, only a week later. The quants are blocked immediately since inventory is performed on a bin basis, not on a quant basis. If there were a time delay, the quants could already be stored in another bin and this would then give false results.

When you print out physical inventory documents, you can define in the Implementation Guide whether the storage bin and material numbers should be displayed or not by choosing the activity Define Default Values [Ext.] (*Logistics Execution → Warehouse Management → Activities → Physical Inventory → Define Default Values*). The cycle-counting procedure ignores these inputs since they are required for inventory.

It is not possible to find a different material on the same bin since the search is performed at quant level.

Take Continuous Inventory Based on Putaway

Purpose

When you define this inventory method for a storage type, the system sets the inventory indicator for the storage bin the first time goods are placed in the storage bin for the fiscal year. When you confirm transfer orders for the stock placement, inventory is taken and recorded for the storage bin. In general, inventory is not taken for the storage bin for the remainder of the fiscal year, even though a completely different quant is in the storage bin or the bin is empty at the end of the year. All movements to this bin must be individually identifiable throughout the entire fiscal year. For this to happen, you need to archive the transfer orders when you reorganize the database.

A high percentage of storage bins is generally inventoried by the continuous inventory based on putaway. However, it may be the case that some storage bins have no putaways in a fiscal year. If inventory based on putaway is set for the storage type in which these bins are located, the bins will not be inventoried during the year. In this situation, you should also define the annual inventory method for this storage type so that you can conduct an annual inventory for these storage bins.
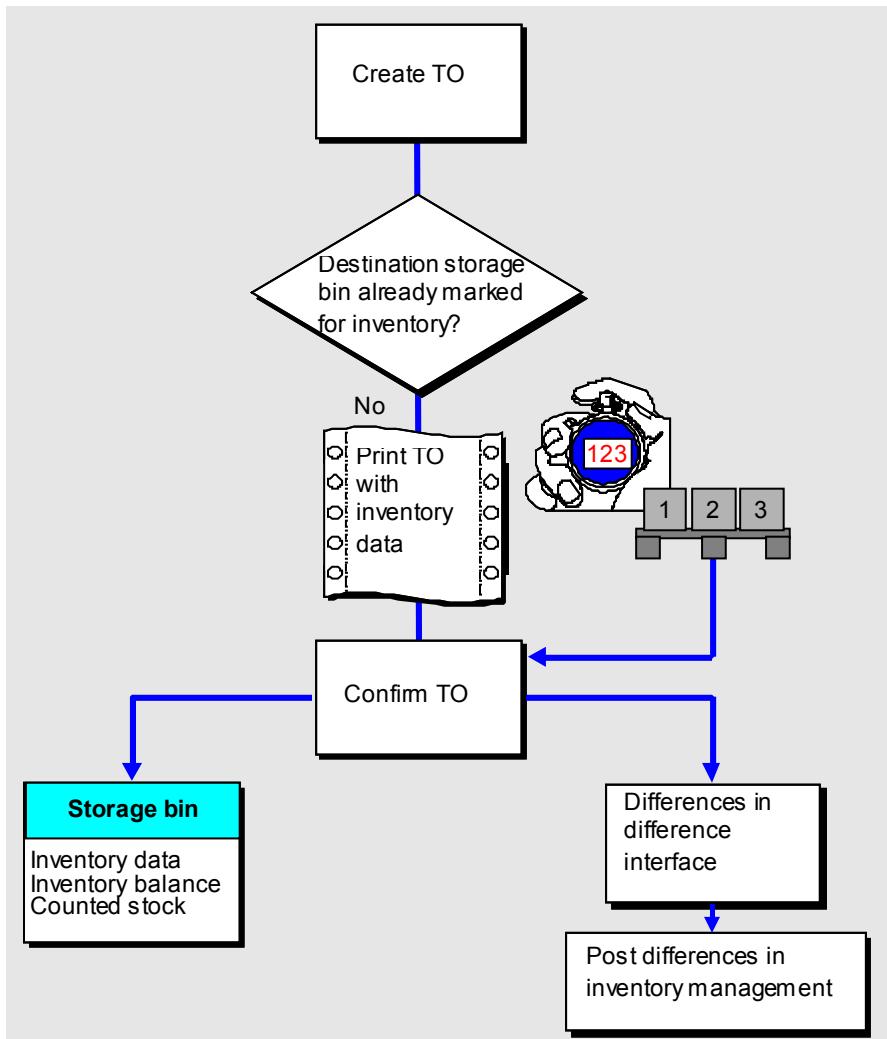
Prerequisites

Inventory methods are defined for each storage type. To define a continuous inventory method based on putaway for a storage type, select *Activities → Physical Inventory → Define Types per Storage Type* in the Warehouse Management section of the Implementation Guide (IMG).

Process Flow

The process of taking inventory based on putaway is illustrated in the following graphic:

Take Continuous Inventory Based on Putaway

When a transfer order is created, the system checks whether the storage type requires inventory at putaway. The system reads the storage bin data to determine if inventory has already been taken during a previous putaway to the storage bin.

If an inventory has not taken place in the fiscal year, an inventory notice is printed on the putaway transfer order, which is also treated as the inventory transfer order. The system prompts you to take inventory and then confirm it.

When you confirm the transfer order (and the inventory), the system sets the inventory indicator for the storage bin. The bin is then regarded as inventoried. The corresponding inventory fields for the storage bin and quant are updated.

Any differences between the counted amount and the inventory balance in the books for the storage bin must be recorded in Warehouse Management (WM) in the interim storage area for differences and then cleared from WM and recorded in Inventory Management (IM).

See also:

Processing Inventory Differences in WM [Page 466]

Stock Differences [Page 185]

Run a Zero Stock Check

Purpose

The accuracy of the stock balance in a warehouse can be guaranteed with other methods besides taking inventory. You should also have the option of carrying out corrections to stock balances on a regular basis. The monitoring, checking, and correcting of the stock balance whenever material is removed from stock is very important, especially in a warehouse with partial-pick options. In Warehouse Management (WM), this function is known as the zero stock check.

With the zero stock check, you can use the fact that a storage bin was emptied for picking in order to trigger a bin inventory check.

When zero stock check has been defined for a storage type, the system checks whether the storage bin is empty after the stock has been picked. The transfer order for picking is printed with a notice that the zero stock check is active for a specific storage bin. When the warehouse worker removes the stock from the bin, he or she must check to see whether the storage bin is actually empty. When you confirm the transfer order for the pick, the system displays a dialog box in which you confirm that the storage bin is empty.

If the warehouse worker finds that the storage bin is not actually empty, you enter the actual amount that was counted in the bin when you confirm the transfer order. The system automatically corrects the stock (the inventory balance is zero, yet the storage bin still contains a certain quantity), using the interim storage area for differences. Afterwards, the difference must be posted from WM into Inventory Management (IM), which clears the posting.

See also:

Stock Differences [Page 185]

There are three ways to use the zero stock check:

- The system automatically activates the zero stock check.

- You request the zero stock check manually. It may be the case that a warehouse worker notices that a storage bin is emptied when stock has been picked, but zero stock check is not set up for this storage bin.

- You define zero stock check as an inventory method. Inventory of the storage bin is taken each time a zero stock check is carried out. When you confirm the transfer order, the system updates data about physical inventory for the storage bin.

> Zero stock check is not applicable for all storage types. It is not available for mixed storage, for example. The zero stock check is not applicable in an SU-managed bulk storage area.

See also:

Automatic Zero Stock Check [Page 484]

Manual Zero Stock Check [Page 485]

Prerequisites
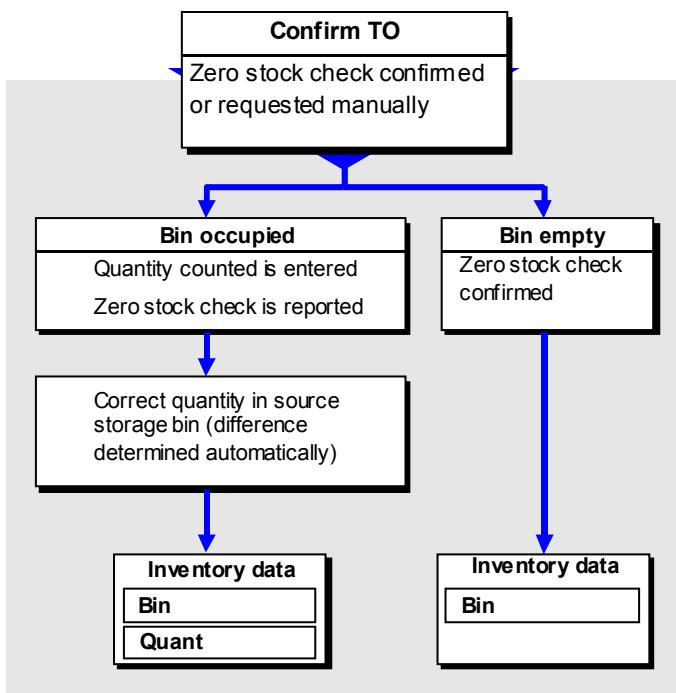
Inventory methods are defined for each storage type. To set up the zero stock check method for a storage type, choose *Activities → Physical Inventory → Define Types per Storage Type* in the Warehouse Management Implementation Guide (IMG).

Before you activate the zero stock check, you should make sure that the transfer order generation, the physical movement, and the transfer order confirmation all take place within a reasonable amount of time from an organizational viewpoint. Otherwise, you cannot take advantage of the zero stock check method.

Process Flow

When zero stock check is defined as an inventory method for a storage type, the inventory fields are updated for the storage bin and/or quant. After a zero stock check, the storage bin is regarded as having been inventoried.

The zero stock check process is illustrated below as an inventory method which also corresponds to the process described for manual zero stock checks:

As a rule, a high percentage of storage bins have inventory taken with the continuous inventory based on zero stock check. However during the fiscal year, some storage bins may not have been emptied by picking. In this situation, you should also set the annual inventory method for this storage type so that you can conduct an annual inventory for these storage bins.

Run a Zero Stock Check

Example: Automatic Zero Stock Check

With this type of zero stock check there are two possibilities. Either the storage bin is empty or it is not empty when stock is removed from it with a transfer order for stock removal. If the storage bin is empty, the transfer order item must be confirmed.

Storage Bin is Empty When Stock is Removed

After a goods issue in IM, the entire quantity of material is removed from the bin with a stock removal transfer order. Because the zero stock check indicator is set for the storage type and the storage bin is empty, the system automatically activates zero stock check. When the transfer order is created, the system issues a warning message that the bin will be empty when the material is removed. When the transfer order is printed, it contains a message that zero stock check has been activated for the storage bin.

When the warehouse clerk removes material from the storage bin, he must take an inventory of the bin. Using the transfer order on which the warehouse clerk wrote the results of the inventory, you confirm the stock removal transfer order. When you confirm the transfer order, the system displays a pop-up window for the zero stock check in which you confirm that the storage bin is empty (by choosing *Confirm empty bin*).
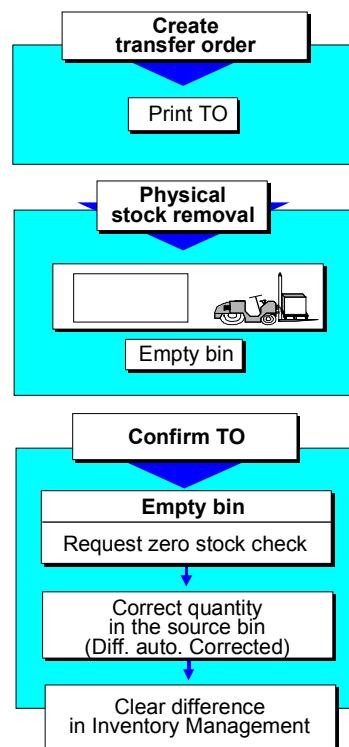
Storage Bin is not Empty When Stock is Removed

In this case, the actual situation in the warehouse does not match the book inventory for the storage bin. According to the book inventory, the storage bin should be empty after stock is removed. The system activated the zero stock check, as described above. However, when the stock was removed from the bin, the warehouse worker found a quantity of material in the bin.

When you confirm the transfer order, you enter the quantity that remained on the storage bin in the zero stock check window. The system posts the remaining amount as a positive quantity in the storage bin and as a negative quantity in the interim storage area for differences. Afterwards, this difference must be recorded in IM.

Example: Manual Zero Stock Check

The process for manually requesting zero stock check is illustrated below.

In some cases when a warehouse worker removes stock from a storage bin with a stock removal transfer order, he notices that the bin is empty. However the book inventory shows that the bin is not supposed to be empty. The warehouse worker reports that the storage bin was emptied by the stock removal.

When you confirm the transfer order for the stock removal, you can request zero stock check on the item confirmation screen. The system displays a window in which you enter the necessary data. When you post the confirmation, the system automatically calculates the difference and posts this difference to the interim storage area. The difference on the interim storage area must be cleared and recorded in IM. The book quantity for the bin is corrected during confirmation.

Interfaces to External Systems

See also:

MM MM-MOB and WM-LSR Interfaces [Ext.]

Automated Warehousing Systems

Due to the importance of inventory and order accuracy levels, the use of automated putaway and picking systems in the warehouse have gained in significance in recent years. The control of material flow in many storage areas is no longer carried out manually but by autonomous warehouse control units (WCUs). The task of the WCU is to control and monitor automatic loading and unloading devices and conveyer equipment used for handling the materials.

Using the WCU Interface via REMOTE FUNCTION CALL

SAP provides an interface that supports bi-directional data transfer between WM and automatic storage and retrieval systems (AS/RS). With this interface, there is a wide range of scenarios for using automatic applications -- from fork lift control systems, that receive the movement orders, to fully automated warehouses, that can optimize the movement orders and even manage individual storage bins.

For detailed information about this interface, see MM MM-MOB and WM-LSR Interfaces [Ext.].

Functionality

The interface to the Warehouse Control Unit supports the following functions:

SAP R/3 → External system

- Transmitting transfer order when they are created

- Releasing groups for multiple processing

  This triggers the start of transfer order processing in the external system.

- Cancellation requests

  This transmits either the transfer order cancellation itself or the requirement to cancel a transfer order depending upon the system that assigns storage bins.

- Sending inventory document list (for physical inventory)

External system → SAP R/3

- Creating transfer orders (storage bins are assigned by the external system)

- Confirming transfer orders (confirms completion of physical movement)

- Canceling transfer orders (the external system can initiate this only if the transfer order has not yet been confirmed)

- Blocking bins for receiving stock (due to malfunction of automatic fork lifts etc.)

- Creating and changing transfer requirements (useful, for example, when planning transfer orders for using materials in production at a later time)

- Receiving and posting the count results of a physical inventory

- Moving storage units

Technology

Technically, this interface is based on transactional REMOTE FUNCTION CALL. Data is transmitted in IDoc (intermediate document) format. The actual communication is supported by

ALE (Application Link Enabling), that offers logical error handling as well as a finely-tuned monitoring capability.

Software/Hardware Prerequisites

For this interface, you need to create C programs to send and receive data. SAP certifies partners for this interface which makes it possible to customize the system based on individual needs.

For a list of partners that are certified through SAP's Complementary Software Program, see internet address **http://www.sap-ag.de/** (SAP's homepage).

You also need the component WM-LSR. This is described under MM MM-MOB and WM-LSR Interfaces [Ext.].

Setting up the Interface

For instructions on how to set up your system to use this interface, see *Interfaces* → *External systems* → *Define ALE link* in the *Warehouse Management IMG* documentation.

Using the WCU Interface via CPI-C and QAP-I

Prior to Release 3.0, the QAP-I interface was used for the link between automated storage and retrieval systems and WM. The QAP-I interface will continue to exist as an optional interface, however, the maintenance of this interface will only remain in effect for a short time. Therefore, all new projects should only use the ALE interface. For more information about the QAP-I interface, see the *Warehouse Management* documentation for Release 2.2.

Mobile Data Entry (MDE)

A standard SAP interface makes it possible for you to collect data using remote input (for example, via bar-code scanning devices or remote keying) and post it to the database in the SAP system.

The SAP system supports the following functions:

- Entry of data to post goods issues or receipts

- Entry of physical inventory count results (for posting in WM)

- Entry of packaging data into delivery documents

- Transmission of delivery documents to an external system

- Entry of picking quantities in delivery documents in shipping (when WM is not in use)

- Entry of data for general movements in the warehouse (creating transfer orders)

This interface allows you to link to picking systems such as pick-to-light-systems or carousels without the use of WM.

To use this interface, you need to make note of the following:

1. You need the components MM-MOB that is integrated in the PPEC application component.

2. You need to create a program that receives and transmits data in IDoc (intermediate document) format that was received using remote data processing equipment.

3. Technically, data is brought into the SAP system in the form of tables via transactional REMOTE FUNCTION CALL (tRFC) from a central SAP function module. The data is stored as IDoc's and initiates processing asynchronously. This ensures that data is never lost.

4. You must decide whether you need an **online** or **offline** operation.

   Online means retrieving data and transmitting it directly to the R/3 system. We recommend this method, for example, to retrieve data for goods receipts that must be processed immediately.

   You may use the MM-MOB interface to transmit data offline. By offline, we are referring to the transfer of data as a block at a later point in time than when it was created. The obvious disadvantage is the time delay. It makes sense for the collection of data that is not time critical, such as physical inventory counts. The least expensive method is the use of a file transfer technique. This technique uses an SAP standard interface program to read the data from the dataset.
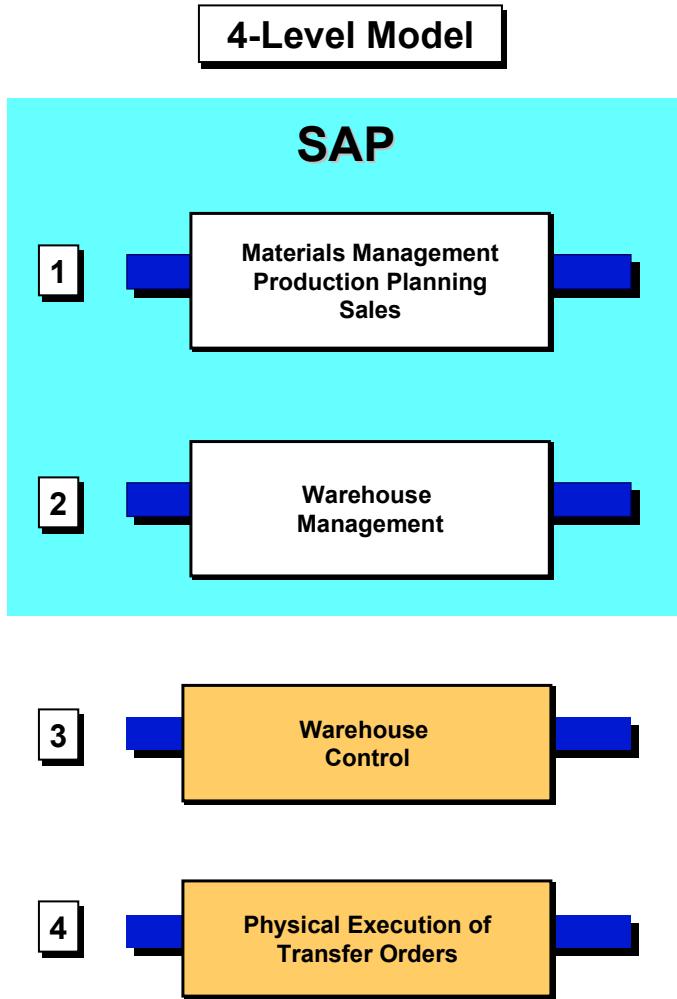
See also:

Bar Codes [Page 52]

MM MM-MOB and WM-LSR Interfaces [Ext.]

R/2-R/3 Link

The R/3 Warehouse Management (WM) link to R/2 provides the capability for customers who already have an SAP R/2 host system to manage all warehousing activities using the R/3 System user interface.

The Four-Level Model

The architecture of a modern, automated warehouse system can be displayed in the form of a four-level model in which four systems fulfill different tasks.

Level 1:   The Host System

On the first level is a central EDP system (also called the *host system*). The host system carries out the functions of inventory management and material requirements planning.

Level 2:　　　　The R/3 WM System

On the second level is a *Warehouse Management (WM)* system that manages the storage bins and determines which material transfers need to be executed.

Level 3:　　　　The WCU system

On the third level is a *Warehouse Control Unit (WCU)* in an automated warehouse that converts the transfer requirements of the WM system into commands for the conveyor equipment, puts these in an optimal sequence, and then monitors them.

Level 4:　　　　The PMC system

On the fourth level there is a *Programmable Memory Control (PMC)* system for the conveyor equipment that executes the conveyor commands.

SAP Components in the Four-Level Model

The first two levels are supported in the SAP system:

- All integrated applications, such as Inventory Management, Material Requirements Planning, Production, Sales, Financial Accounting, and so on, are located in the central EDP system. In the SAP system, these integrated applications can run on a host system (R/2) or in a client-server architecture (R/3).

- WM can also be installed as an R/2 or R/3 application system.

Computer Configuration

Each level can either run on its own system or several levels can run on the same system.

Central R/2 Warehouse Management System

The term "central" Warehouse Management applies if WM runs in R/2 on the host system or in R/3 in the client-server architecture as an integrated application.

R/2-R/3 Link

It is also possible to install WM as an R/3 system on its own computer separately from the R/2 System so that the WM functions can be carried out independent of the availability of the R/2 system.

Communication Between the Levels

Even if the different levels run on separate computers, they need to be able to communicate with one another. The interface between the different computers should not be set up as a rigid connection because data needs to be transferred continuously - as in an integrated application.

In this guide, we discuss the communication between an R/2 host system (1st level) and an R/3 Warehouse Management system (2nd level).

Advantages of the R/2-R/3 Link

The advantages of a system that runs as an R/3 application separate from the other R/2 applications (Inventory Management, Sales, Production) include the following:

24-Hour Availability

The production department of many companies are frequently in operation two or three shifts per day. This means that operating hours in the warehouse are longer as well. On the one hand, the production department must be supplied with the necessary raw materials and other supplies that are stored in the warehouse. On the other hand, finished products must be transferred from production to the warehouse for storage.

For this reason, the R/3 Warehouse Management system needs to be available 24 hours a day. Pallets can then be taken from production, for example, and placed into storage even if the host system is not available.

Reduction of System Load in the Host

The host system is relieved of all warehousing functions. System performance can thus be improved.

Independence from the Host System

It is possible to work with the R/3 WM system even if the host is not available (for example, if the host system shuts down unexpectedly).

If the host system is not available, it is still possible to create transfer orders in the R/3 system. The corresponding goods receipts or goods issues messages to the host are stored temporarily and then sent as soon as the host becomes active again.

If there are any breakdowns in the host system, these do not affect transactions carried out in the R/3 WM system.

R/3 User Interface

The R/3 WM system offers the same user-friendly CUA user interface as the integrated version of WM in the R/3 system.

Automatic Reposting

Some goods movements postings in the R/3 System are automatically carried over to the R/2 System.

Working with Two systems Simultaneously

You can work with both systems simultaneously at one screen. You log on to the R/3 application through your terminal and also have access to the host system via the CUA interface. For example, you can post a goods movement in the R/2 Inventory Management system using one window and, after the posting is complete, you create the corresponding transfer order in the R/3 Warehouse Management system in another window.

Integration in the Overall System

The R/2 WM system runs on a host computer with all other R/2 components (for example, Inventory Management, Material Requirements Planning, Production, Accounting).

R/3 WM is installed on a separate system (for example, under UNIX). In addition to WM, other basic components are required for processing in R/3.

The R/3 WM system communicates with the R/2 host system, that is, with the SAP components relevant for warehousing functions, via a CPI-C (Common Programming Interface - Communication) interface. In this way, full integration in the overall system is ensured.

R/2-R/3 Link

System Release Level

The R/2 host system used in conjunction with the R/3 Warehouse Management system can have Release Level 4.3 or 5.0. In this section, we refer only to Release 5.0.

> For system configuration questions that are beyond the scope of this guide, please contact your SAP WM technical advisor for further information.

General Communication Process

This section contains the following topics:
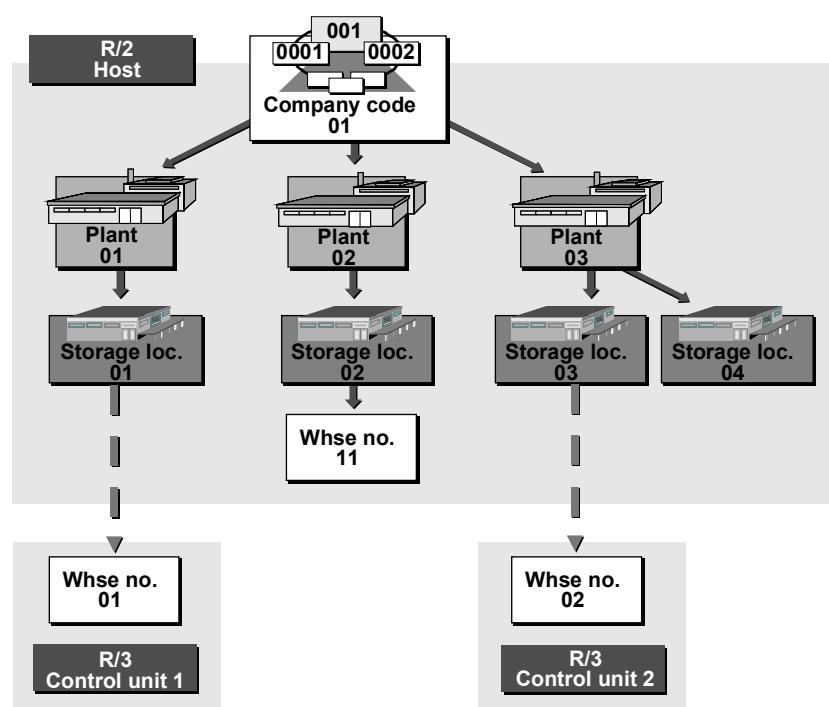
Link from Storage Location to R/3 Warehouse Number
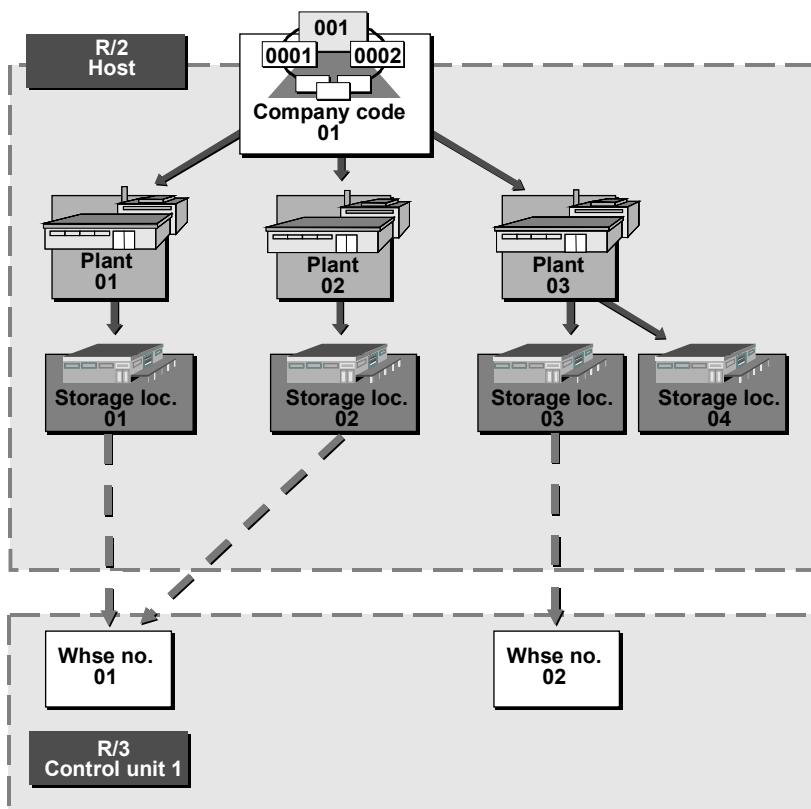
In the R/2 System, the RM storage location is linked to the R/3 warehouse number via an assignment table, similar to the procedure for integrated processing (see below). Warehouse-relevant transactions that are posted in an R/2 storage location initiate a communication process between the two systems.

Linking Two or More Plants to the Same Warehouse Number

As illustrated below, it is also possible to link two or more plants with their corresponding storage locations to the same warehouse number in the R/3 Warehouse Management component.

How to Link a Storage Location to an R/3 Warehouse Number

For information on how to link an RM storage location to an R/3 warehouse number, see PART 1: R/2 → R/3 Processes [Page 557].

Master Data

In the R/3 Warehouse Management (WM) component, the master data is distributed between the two systems involved as follows:

Master Data in R/2

In the R/2 System, the material master contains all the data that is required for Inventory Management (RM) and the other integrated applications. The RM stock figures are maintained in R/2 only.

The material master in R/2 does not contain any WM data for the storage location managed in the R/3 System.

Master Data in R/3

In the R/3 System you maintain the following master data:

- Warehouse master and quants

  The individual storage bins and the material stock (quants) are managed in the R/3 System. You can display the bin stock figures in this system as well.

- Material master

  In R/3 you also maintain a material master record for each material managed in your warehouse. The material master data is required for transactions in Warehouse Management. For example, the system displays the material short text from the material master record when a transfer order is being processed.

  The R/3 material master only contains data that is required for Warehouse Management. Data in the R/2 material master that is relevant for Warehouse Management (for example, the material short text, the stockkeeping unit) is transferred to the R/3 material master and may be maintained in R/3. Warehouse data that exists in R/3 only (for example, storage unit loading instructions) is maintained in R/3.

  In this way, you can be sure that data common to both systems does not differ in any way.

Goods Movement Data

Warehouse-relevant documents are posted in both systems:

- Documents from the integrated applications, such as RM documents, deliveries, production orders, and so on, are posted in the R/2 System.

- Only documents relating to Warehouse Management are posted in R/3, for example, transfer requirements, transfer orders and posting change notices. Usually, transfer requirements and posting changes are created automatically as a result of an R/2 posting.

Inventory Data

As in the integrated application, inventory is executed in the R/3 WM component based on the storage bins.

Inventory differences found during an inventory procedure are transferred to the Inventory Management component.
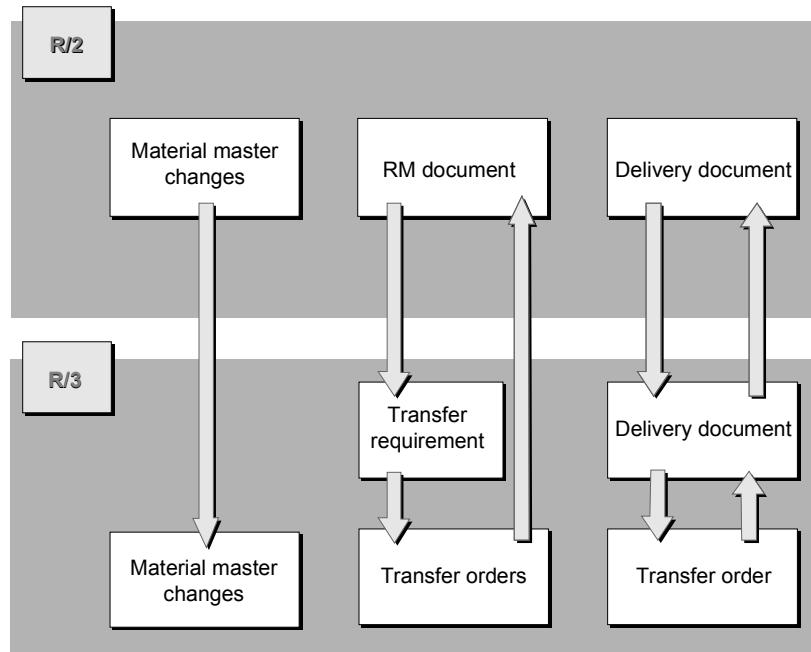
When Does Communication Take Place?

If data is changed in one system (R/2 or R/3), or if documents that affect the other system are posted, the relevant data is transferred to the companion system.

The direction of the communication (R/2 → R/3 or R/3 → R/2) varies, depending on the transaction. The direction is determined by the system that initiates the process.

Communication between the two systems takes place with the following transactions (shown in the figure below):

Material Master Changes

Material master maintenance (creating new material master records or changing existing material master records) is always initiated in the R/2 System. Afterwards, the material master data is transferred to R/3.

Goods Transfers

Goods transfers such as material deliveries or material issues must be processed both in Inventory Management as well as in Warehouse Management.

As a rule, the RM document is first posted in R/2. Afterwards, the transfer order is created in R/3. This process can also, however, be initiated by the R/3 System since it is possible with goods receipts and goods issues to create the transfer order first in R/3. The transfer data is transferred to R/3 and the RM document posted automatically.

Processing Deliveries

The deliveries are created in the R/2 Sales and Distribution (RV) component. As soon as the delivery data has been transferred to the R/3 system, the transfer orders for picking are created. After the transfer orders have been executed, the picked quantities are confirmed in the R/2

System so that the goods issue posting in R/2 is possible. This is a bi-directional process (R/2 →
R/3 → R/2).

Difference Posting

If you enter differences in the R/3 System during the confirmation of a goods transfer, these are
transmitted to the R/2 System.

What Data is Transmitted?

The entire document is not transmitted, only the data that is relevant for the companion system.
A data extract is automatically created from the respective document (for example, the GR
document). This extract is then transmitted to the companion system in the form of a
communication document.

Tables control which data is to be included in a communication document.
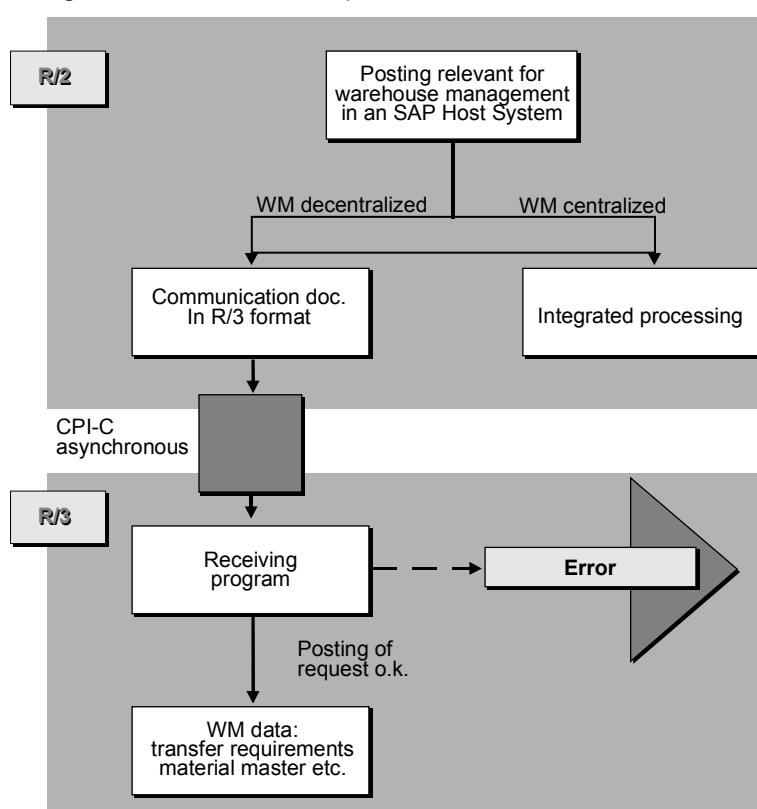
For more information on this topic, see

Communication Process R/2 -> R/3

The general communication process R/2 $\rightarrow$ R/3 is illustrated below.

```
R/2                    ┌──────────────────────┐
                       │ Posting relevant for │
                       │ warehouse management │
                       │ in an SAP Host System│
                       └──────────────────────┘

        WM decentralized              WM centralized

   ┌──────────────────┐          ┌──────────────────────┐
   │ Communication doc.│          │ Integrated processing │
   │  In R/3 format    │          └──────────────────────┘
   └──────────────────┘

CPI-C
asynchronous

R/3
   ┌──────────────────┐
   │    Receiving     │ - - - - →   Error
   │    program       │
   └──────────────────┘

              Posting of
              request o.k.

   ┌──────────────────┐
   │     WM data:     │
   │transfer requirements│
   │ material master etc.│
   └──────────────────┘
```

Storage Location Linked to Warehouse Number ?

If a posting in R/2 is relevant for the warehouse (for example, goods receipt), the system checks whether the storage location is linked to an R/2 warehouse number.

Creating a Communication Document in R/2
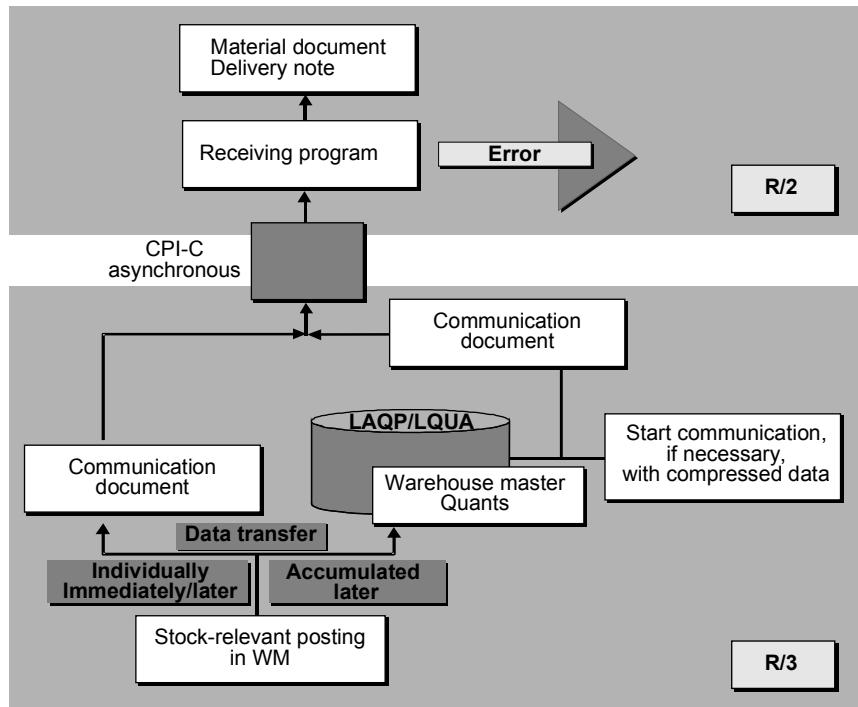
If there is a link to an R/2 warehouse number, the system creates a communication document in R/3 format. This document contains all the information relevant for Warehouse Management.

Downloading the Communication Document to R/3

The communication document is transmitted to the R/3 System and received there by a receiving program. Based on this communication document, the system executes the necessary postings (for example, transfer requirement, quant to interim storage area, material master change) in the WM component.

Communication Process R/3 -> R/2

The general communication process for R/3 → R/2 is illustrated below.

If you post a goods movement in Warehouse Management (R/3) first, and then in Inventory Management (R/2), the communication process is as follows:

Creating a Communication Document in R/3

If you execute a posting in Warehouse Management that is relevant for inventory (for example, transfer order for stock placement), a communication document is set up in the R/3 System.
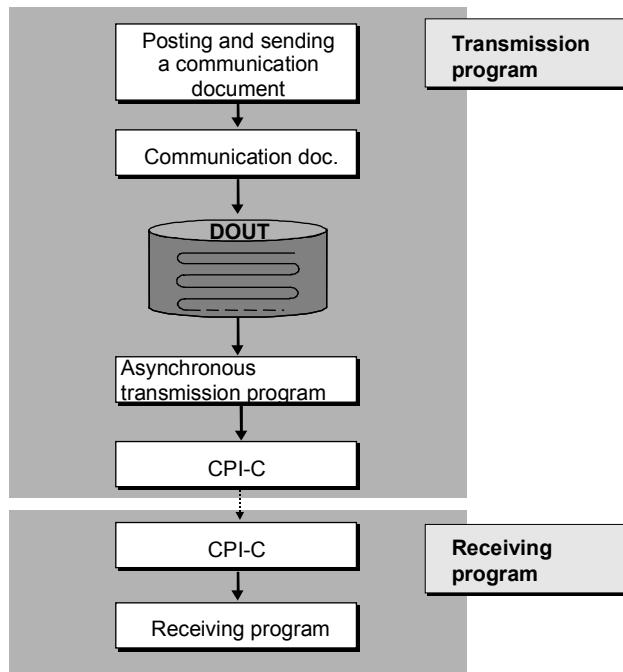
Uploading the Communication Document to R/2

Depending on your system configuration and host availability, the communication document is uploaded immediately, or at a later time, to the R/2 System and received there by a receiving program that executes the necessary postings in R/2.

Technical Communication Process

Irrespective of the direction (R/2 → R/3 or R/3 → R/2) of communication, the data exchange takes place as follows:

```
┌─────────────────────┐
│ Posting and sending │   ┌──────────────────┐
│ a communication     │   │ Transmission     │
│ document            │   │ program          │
└─────────┬───────────┘   └──────────────────┘
          ↓
┌─────────────────────┐
│ Communication doc.  │
└─────────┬───────────┘
          ↓
      ╭─────────╮
      │  DOUT   │
      ╰─────────╯
          ↓
┌─────────────────────┐
│ Asynchronous        │
│ transmission program│
└─────────┬───────────┘
          ↓
┌─────────────────────┐
│ CPI-C               │
└─────────┊───────────┘
          ┊
┌─────────────────────┐   ┌──────────────────┐
│ CPI-C               │   │ Receiving        │
└─────────┬───────────┘   │ program          │
          ↓               └──────────────────┘
┌─────────────────────┐
│ Receiving program   │
└─────────────────────┘
```

Checking the Link

Whenever a relevant transaction is posted, the system concludes that data needs to be transmitted to the companion system.

Determining the Receiver

The transmitting system determines the destination system by means of a communication number.

Creating the Communication Document

The communication document is created by the respective application and placed into a special queue in an interim file called a DOUT.

Transmitting the Communication Document

The communication document is usually transmitted to the receiving system by means of an asynchronous procedure.

A transmission program (commonly called the "driver") is activated, which then sets up the connection to the receiving program and transmits the communication document via the CPI-C.

Receiving the Communication Document

The communication document is received in the receiving system and placed into an interim table. The necessary postings are then executed automatically.

Terms that Apply to the Communication Process

The following terms are used frequently in connection with the R/3 Warehouse Management (WM) component.

Communication Document

The *communication document* forms the central element of the communication process. If data needs to be transferred between the two systems, a communication document is always created for the transmission process.

A communication document is a data chain that is transmitted for a transaction. It consists of *communication records* that all have the same record number. The first and the last record of a communication document are marked as such. In this way, the communication document forms a closed, logical unit.

Communication Record

A communication record is a data extract in R/3 format that consists of the individual data to be transmitted.

Record Type

Because different data has to be transmitted, depending on the transaction involved and the direction of the communication process, communication records are assigned to a *record type*.

Record Identification

A communication record is identified by its record type and its record number. Communication records with the same record number, irrespective of their record type, together form a communication document.

Data Structure

The structure of a communication document is stored in the Data Dictionary of both systems in R/3 format and depends on the record type. A separate table is defined for each *record type*. This table stores the corresponding communication records.

R/3 Format

Irrespective of the communication direction, the communication records are always transmitted in R/3 format. The record structure is identical in the R/2 and R/3 Data Dictionary. The decoding of the data always takes place in the R/2 System.

In this way, the companion system is always responsible for the data conversion. For this reason, it is unimportant to WM which system functions as the companion system (R/2 host, non-SAP host).

Record Types

The table below displays an overview of the record types, the tables in which the individual communication records are stored, and the usage of the individual communication records.

Overview of Record Types

Rec.Type	Table	Direction	Usage
WM01	LDK01	R/2 → R/3	Goods movements from Inventory Management
WM02	LDK02	R/2 → R/3	Posting changes
WM03	LDK03	R/2 → R/3	Transmission of general delivery data
WM04	LDK04	R/2 → R/3	Transmission of additional delivery data
WM05	LDK05	R/2 → R/3	Material master changes (creating/changing)
WM07	LDK07	R/3 → R/2	Goods movements from Warehouse Management
WM08	LDK08	R/3 → R/2	Confirmation of LVS quantities to RV deliv.notes
WM09	LDK09	R/3 → R/2	Communication of differences

Status of Communication Records

When a communication document is created, the communication records are given a record status for the technical transmission process. On the basis of this status, the system can determine the position of each communication record within the communication document.

The possible record statuses are listed in the table below:

Status of Communication Records

Status	for...	Meaning
F	First	First record of a communication document
L	Last	Last record of a communication document
blank	Middle	Record positioned between first and last record when more than 2 exist
S	Single	Communication document consisting of one record

You can view the status of a record when using the analysis tool. See .

Communication Number

If the system discovers during a transaction that a communication document is to be created, it first determines the receiver on the basis of a *communication number*.

Record Types

A communication number is the technical definition of the receiver (destination system, application, client, receiving program, and so on). The key for the queue file "DOUT" is determined by means of the communication number.

Queue ("DOUT")

The queue is in an interim file (called DOUT) in the transmitting system. The communication records to be transmitted are stored here before the transmission takes place.

The communication documents can be sent from the DOUT file to the companion system either automatically or manually.

Transmission Program

There is a program (the so-called "driver") that is responsible for the transmission of communication documents to the partner system.

If transmission takes place, the program performs the following tasks:

- It sets up the connection to the receiving program in the destination system.

- It transmits the communication documents from the DOUT file to the destination system via CPI-C.

To activate the driver program, there are various possibilities, depending upon the system (R/2 or R/3). The driver can be started

- manually

- automatically

- as a batch process

Receiving Program

In the receiving system, the communication document is received by a receiving program. The receiving program performs the following functions:

1. It writes the individual communication records in the table that was defined for the corresponding record type (see Mail Control in the R/3 System [Page 570].)

2. A status record (LDK00) is created for each communication record that serves to monitor the communication process.

3. It checks the data contents of the communication records.

4. It initiates the postings in the receiving system.

Receiving Tables

The communication records that are transmitted in a communication document are placed into interim storage in the receiving system (R/3) in the table defined for the respective record type (see Mail Control in the R/3 System [Page 570].)

As soon as the postings required for a communication record have been carried out, the system marks the communication document accordingly.

Status Table LDK00

In order to monitor the communication process, a status record is entered for each communication record in table LDK00 of the receiving system when the communication

document is received. If the receiving system could not process the communication record, this fact is noted accordingly in the status record.

Communication Technique

Communication between the R/2 and R/3 systems always takes place based on asynchronous CPI-C.

By asynchronous, we mean that communication documents are not sent directly or immediately from one system to another. Instead, they are assigned to a queue and the system attempts to send them as soon as the receiving system becomes available.

CPI-C is an independent Price List component belonging to the SAP basic system and is described in detail in the BC SAP-Communication: Programming Guide.

Error Prevention Mechanisms

Error prevention mechanisms are built into the system for the transmitting of communication documents. These mechanisms make sure that:

- A communication document is transmitted only once.

- Incorrect communication documents do not interrupt the connection.

- Communication documents that invoke a logical error are marked as incorrect and stored in an interim table.

- In this way, errors can be analyzed at a later point and error recovery is possible.

Once-Off Data Transfer

Since communication records are placed into interim storage in the receiving system, the system can check upon receipt of a record whether this record has already been transmitted.

If the record was already transmitted and processed once before, the system does not execute any further postings.

If the record was transmitted once before, but not processed further, the system marks the record accordingly.

Error Recovery

If a logical error occurs during the processing task, the system marks the communication document as incorrect in an interim table. In addition, a Mail message pointing out the error is sent to the R/3 or R/2 System user(s) responsible (depending upon the direction of the communication).

The person responsible analyzes the communication document on the basis of the Mail information. As soon as the error has been recovered, the user starts the receiving program again using a transaction in order to repost the communication document.

R/2 -> R/3 Processes

This section describes transactions in the R/2 System that initiate a communication process with the R/3 Warehouse Management applications component. It contains the following topics:

Overview of R/2 -> R/3 Processes

Communication takes place between R/2 → R/3 with the following transactions (see the figure below):

- Material master changes (creating/changing)

- Goods movements from Inventory Management

- Posting changes from Inventory Management

- Transmission of delivery data from Sales and Distribution
  (see Bi-directional Processes [Page 551])

R/2	Material master change	Goods receipt Goods issue Stock transfer	Posting change	Delivery document
Communication documents	LDK05 / DVM01 DVM02	LDK01	LDK02	DVK01 DVK02 DVKTX
R/3	Material master change	Transfer requirement	Posting change notice	Delivery document
		Stock posting		

Material Master Maintenance

A material master record exists in both the SAP R/3 System and the host system.

Material Master R/2

The material master in R/2 contains data of the central applications (Material Requirements Planning, Sales and Distribution, and so on). It does not contain any Warehouse Management data for the storage location managed in R/3.

Material Master R/3

The material master in R/3 contains two types of data:

- General material data

  This includes data such as the material short text and stockkeeping unit (base unit of measure in R/3) which are taken from the R/2 material master.

- Warehouse Management data

  This includes data such as storage unit loading instructions and the storage type indicator, which only exist in R/3 because they are only relevant for the R/3 Warehouse Management component.

Where is General Material Data Maintained?

Since general data exists in both systems, error prevention mechanisms are required to make sure that they do not differ from each other in both systems.

To ensure this, one of the two systems needs to be defined as the *leading system*, that is, as the system in which the data is to be maintained. The data is merely copied over into the other system. There the data can only be displayed, not maintained.

The leading system for the maintenance of a material master record is always the R/2 System since general data in the host system is primarily important for the R/2 logistics applications.

> 💡 You must always maintain a material master record in R/2 first. Only when the material master record has been created in R/2 and copied over into R/3 can you maintain the Warehouse Management data in R/3.
>
> To prevent material data copied into the R/3 System from being changed, the maintenance of the views in the material master record must be limited using the authorizations (Object M_MATE_STA).

Subsequent Maintenance of Warehouse Management Data

If you create a warehouse material in the R/2 System, you must maintain the Warehouse Management data in the R/3 System before the first goods movement takes place. Only then can the system carry out postings for the material in the R/3 system.

If no Warehouse Management data exists during a goods movement for the material being transferred, this causes a logical error during the communication process. The communication document cannot be processed in R/3.

To avoid this, there should be no time lapse between the maintenance of a material master record in R/2 and the subsequent maintenance of the Warehouse Management data. For this purpose, an automatic Mail message is sent to the responsible user in R/3 when a material
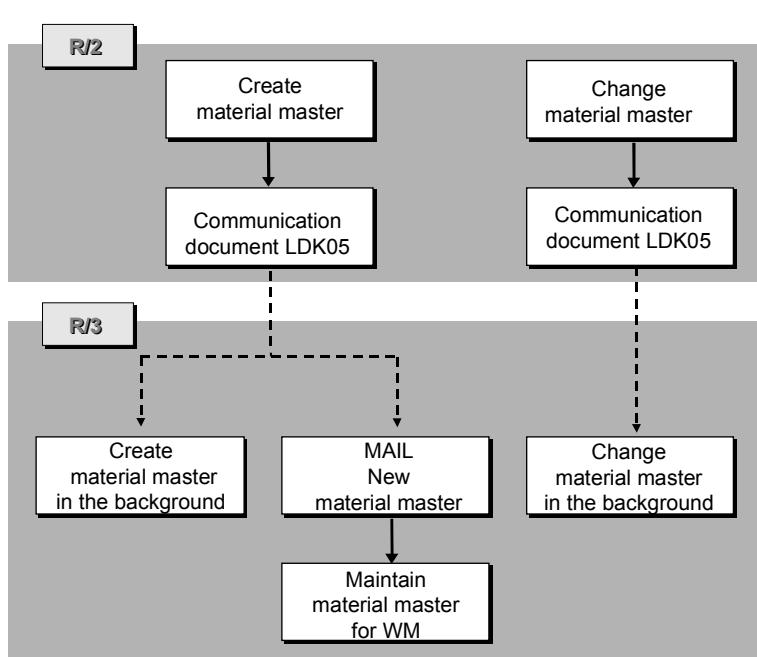
master record is maintained in R/2. This message points out that the Warehouse Management data of the material needs to be maintained as well.

Material master records can also be created in the R/2 Shipping applications component and processed in the R/3 Shipping component. See Shipping Processes (R/2-R/3) [Ext.].
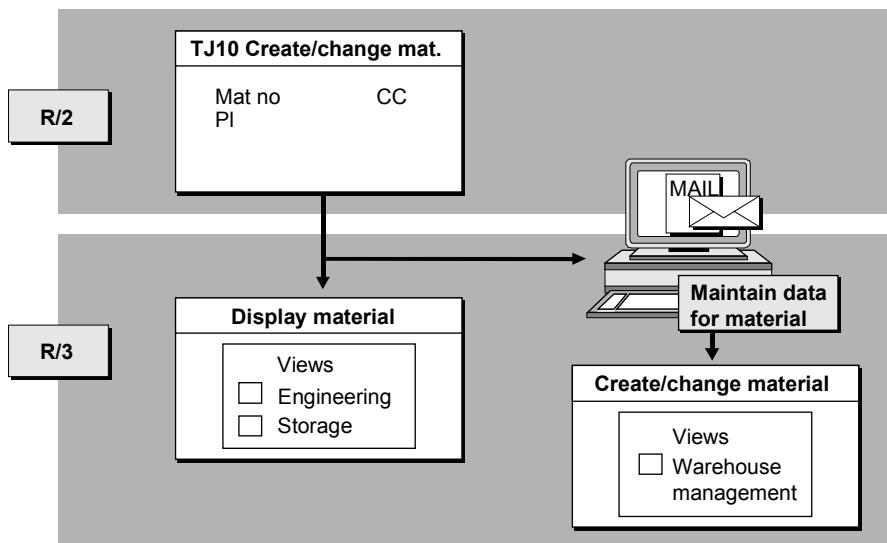
Creating the Material Master Record in R/2

The general process for creating or changing a material master record in an R/2 System that is linked to an R/3 Warehouse Management component is as follows:

```
┌─────────────────────────────────────────────────────────────────────┐
│ ┌──────┐                                                             │
│ │ R/2  │   ┌────────────────┐           ┌────────────────┐           │
│ └──────┘   │    Create      │           │    Change      │           │
│            │ material master│           │ material master│           │
│            └───────┬────────┘           └───────┬────────┘           │
│                    │                            │                    │
│                    ▼                            ▼                    │
│            ┌────────────────┐           ┌────────────────┐           │
│            │ Communication  │           │ Communication  │           │
│            │ document LDK05 │           │ document LDK05 │           │
│            └───────┬────────┘           └───────┬────────┘           │
└────────────────────┼────────────────────────────┼──────────────────┘
┌──────┐             ┊            ┊                ┊                    
│ R/3  │             ┊            ┊                ┊                   
└──────┘   ┌─────────┴──────┐     ┊                ┊                   
           ▼                ▼                      ▼                   
   ┌────────────────┐ ┌────────────────┐  ┌────────────────┐          
   │    Create      │ │     MAIL       │  │    Change      │          
   │ material master│ │     New        │  │ material master│          
   │ in the background│ │material master│  │ in the background│        
   └────────────────┘ └───────┬────────┘  └────────────────┘          
                              ▼                                        
                      ┌────────────────┐                              
                      │   Maintain     │                              
                      │ material master│                              
                      │    for WM      │                              
                      └────────────────┘                              
```

1. An R/2 user creates the material master record in the R/2 System, for example, using the transaction TJ10.

2. If the user maintains the plant data, the system checks whether the plant is managed by the R/3 Warehouse Management component and whether all the statuses required for Warehouse Management (for example, engineering, purchasing) are maintained. If this is the case, the system creates a communication document that contains the material data relevant for the warehouse and sends this document to R/3.

3. This initiates the following actions in the R/3 System:

   – The system creates a new material master record (in the background) with the following views:

     - Engineering/Design

     - Storage

   – The person responsible for R/3 material master maintenance receives a Mail message that refers to the new material master record. This Mail message can be sent as an "express" message if desired (see Mail Control in the R/3 System [Page 570]).

4. As soon as the Mail message has been received, the R/3 user can maintain (create) the material master record data for the Warehouse Management view.

   Only the views maintained by the system (engineering and storage data) can be displayed as illustrated below.
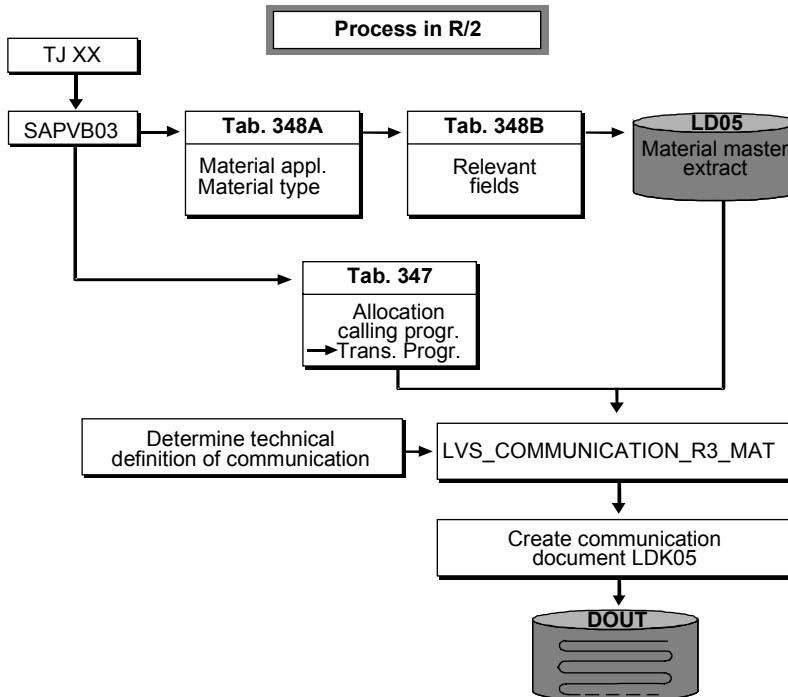
Mail messages can be viewed by choosing *Office* → *Inbox* from the SAP main menu bar.

Technical Process in R/2

Whenever a material master record is changed or created in the R/2 System, this initiates the following actions in the R/2 System:

Creating the Material Master Record in R/2

Relevant Field Check

Material data maintenance is only relevant for Warehouse Management if a plant segment is created.

Creating a Material Master Record

When you post a new material master record in the system, the data relevant for the warehousing system is downloaded if a plant segment is created as well. If the new material master record is only created at client or company code level, the interface to the R/3 warehouse will not be activated.

If a plant segment is created, the system checks in table 340 whether the plant is linked to an R/3 warehouse number. For each plant and warehouse number in this table, a data record is created.

In plant 01, storage location 88 is linked to an R/3 warehouse number. In plant 02 no storage location is managed by an R/3 system. In the R/2 host system, a user creates the client and company code data for a material as well as the plant data for plant 02. This new material is not relevant for the R/3 Warehouse Management component.

If you now create the plant data for plant 01, a communication process takes place.

Changing a Material Master Record

You always change general material data in the R/2 System.

If you make a change to a relevant field in a material master record in the R/2 System, the system creates a new communication document to be sent to the R/3 System.

Procedure

The procedure is as follows:

1. An R/2 user changes data in the material master record that is relevant for Warehouse Management.

2. The system concludes that the data needs to be downloaded to the R/3 System and thus creates a communication document that will be sent to the R/3 System.

3. Based on this communication, the material data is changed in the R/3 System.

Changing Warehouse Management Data

You change Warehouse Management data in the R/3 System. In this case, no communication takes place because only the R/3 material master contains Warehouse Management data.

For information about maintaining the material master in the R/3 System, see Material Master Data [Page 98]

When a changed material master record is posted in the system, the system checks the following items, regardless of the segment changed (that is client, company code, or plant):

• Whether a plant segment exists for a plant that is linked to an R/3 warehouse number

• Whether all the required statuses are maintained (see below)

- Whether the changed fields are relevant for Warehouse Management. The fields relevant for Warehouse Management are defined in table 348B.

> Storage location 88 in plant 01 is linked to an R/3 warehouse number. Plant segment 01 is not yet maintained for a material. If a user changes the material short text (client level), this change is not relevant for the R/3 Warehouse Management component.
>
> However, if plant segment 01 exists for a material and a user changes the material short text, the change is relevant for Warehouse Management.

Checking Maintained Statuses

If the material master record is relevant for the warehouse, the system checks in table 348A whether all the statuses required for the material category and the material type are maintained. table 348A (illustrated below) lists the views that must be maintained for material types. The maintenance of these views affect the transmission of communication documents to the R/3 system.

Material Application/Type for R/3 WM (Table 348A in R/2)

Mat.app.ty	Mater.type	Status:	P	R	P	S	D	W	A	Q	R
C	HAWA		K		E	V		L			

The following statuses, for example, must be maintained for a trading good (material type **HAWA**) of the chemical industry (material application type **C**):

- Engineering   (**K**)
- Purchasing (**E**)
- Sales   (**V**)
- Warehouse (**L**)

Only when all the relevant statuses have been maintained (that is, the views listed in table 348A for the material type) can the material data be transmitted to the R/3 Warehouse Management component without error.

Creating a Data Extract

Via table 348B the system determines the material master fields that are to be downloaded. The system first places these fields as a material master extract into temporary storage in table LD05.

Determining the Transmission Program

Via table 347, the processing task calls up the program that creates the communication document and writes it into the queue.

Determining the Receiver

Via table 342, the transmission program determines the communication number for transaction **003** and then, via table 343, finds the technical definition of the receiving system. table 343 also contains information as to whether the communication document is to be transmitted automatically or manually.

Creating the Material Master Record in R/2

If several R/3 warehouse numbers are linked to the R/2 system, a communication document must be created and transmitted for each R/3 warehouse number.

Creating and Transmitting the Communication Document

The transmission program creates the communication document LDK05 from the material master extract LD05. The fields are converted to R/3 format.

This communication document consists of a record of the record type WM05 and is given the record status **S** (single) (see Status of Communication Records under the topic Record Types [Page 506].)
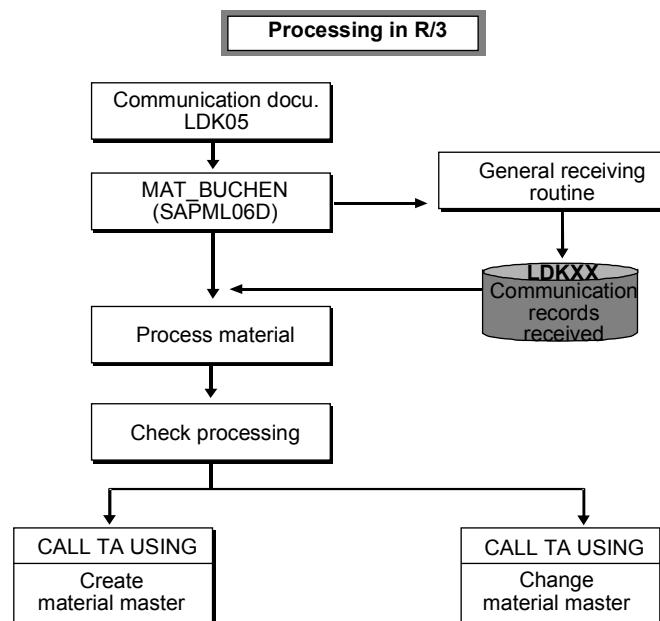
The communication document is first placed into a queue (DOUT). If the transmission is automatic, the document is sent immediately. If you want to start the driver manually, you use the appropriate transaction (see Queue Management in R/2 [Page 562])

> Material data is sent as soon as materials are created for the assigned plant, independent of whether the storage location segments are created or not. If you want to specify which materials are transmitted to the R/3 System, you can copy the transmission program, modify it and enter the information in table 347 instead of using the standard transmission program RLDLVS02.

Technical Process in R/3

If an LDK05 communication document is downloaded to the R/3 System, this initiates the following actions to change the material master record in R/3:

Processing in R/3

```
Communication docu.
       LDK05
          │
          ▼
   MAT_BUCHEN ──────────►  General receiving
   (SAPML06D)                  routine
          │                        │
          │                        ▼
          │                     LDKXX
          │              Communication records
          │                   received
          ◄────────────────────┘
          ▼
   Process material
          │
          ▼
   Check processing
        ┌───┴────────────────┐
        ▼                    ▼
  CALL TA USING        CALL TA USING
     Create               Change
  material master      material master
```

Receiving the Communication Document

The communication document is received in R/3 by a receiving routine and then stored in table LDK05.

Parallel to this, a status record is written into table LDK00 for managing the communication document.

Further Processing

The communication document is processed and checked by a further routine. The system calls up the transaction for maintaining the material master data via the CALL TRANSACTION. The material master record is created or changed, respectively.

If an error occurs during further processing of the document, this is noted in the status record for error recovery later on. The responsible user receives a Mail message pointing out the error. See The Analysis Tool [Page 566] and Mail Control in the R/3 System [Page 570].

Goods Receipt / Goods Issue

To post a goods transfer for the R/3 WM component, two documents are always required:

- Material Document in Inventory Management

  The material document goods receipt or goods issue (GR/GI) document is posted in the R/2 System and initiates the updating of the stock quantities and values in Inventory Management.

- Transfer Order in Warehouse Management

  The transfer order is posted in the R/3 System and used to determine the storage bins for the stock placement/removal. It initiates the updating of the stock quantities in Warehouse Management.

Creating Transfer Orders Automatically

As in the integrated Warehouse Management component, transfer orders can be generated automatically in the R/3 WM component after communication documents have been posted to the interface and the transfer requirements or posting change notices have been created from them. Using a background process, the system attempts to create transfer orders. In the case of an error, an express mail can be sent to an appropriate user. This user can then keep himself/herself informed about the error via his/her inbox and initiate the creation of a transfer order in a dialog box.

The activation of this function is dependent upon the movement type and takes place in the R/2 System (table 341).

To assign the recipient for mail messages in case of errors, see "*Define decentralized link to R/2*" in the *Warehouse Management IMG* documentation. You can assign a separate user for each communication document record type.

The automatic creation of transfer orders is only possible beginning with Release 5.0G of the R/2 System.

Decision on Leading System

For each movement, you must decide which system is the leading system - that is, where you want to post the data first.

If you want to post the GR/GI document in Inventory Management first, there is a communication from R/2 → R/3. This communication type will be explained in this section.
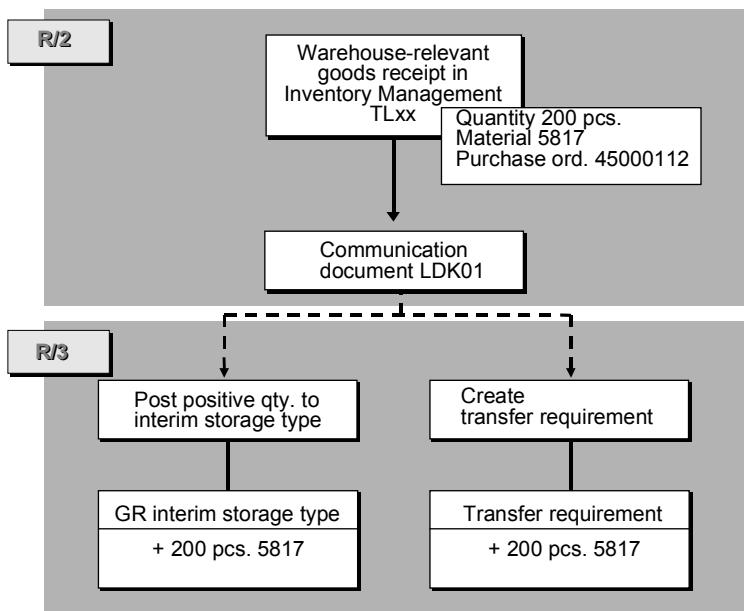
If you want to post the transfer order in Warehouse Management first, there is a communication from R/3 → R/2. This communication type is explained in the section .

Certain goods movements, such as goods receipts for purchase orders, should be posted in Inventory Management first because in this transaction the system carries out checks that are only possible in the R/2 system.

General Process

If a goods movement (for example, goods receipt) is posted in Inventory Management first, and then in Warehouse Management, the procedure is as follows:

Goods Receipt

1. You post the goods receipt in the R/2 System (example: goods receipt for purchase order with transaction TL01). With this posting, you must enter a storage location.

2. The system establishes that the storage location is linked to an R/3 warehouse number and that a communication needs to take place. It creates the communication document and sends this document to R/3.

3. The communication initiates the following postings in R/3:

   - a positive quant is posted to the GR (goods receipt) interim storage area.

   - a transfer requirement is created.

4. To place the goods into storage, you create a transfer order by referring to the transfer requirement that was created automatically. For information about how to create transfer orders from transfer requirements in WM, see Transfer Orders [Page 159].

Goods Receipt / Goods Issue

Goods Issue

In the case of a goods issue, the procedure is the same, but this time the communication initiates the following updates in the R/3 System:

- A negative quant is posted to the GI (goods issue) interim storage area.

- A transfer requirement for stock removal is created.

No LVS Posting Line

When you enter a goods movement in Inventory Management, it is not possible to view the interim storage information on the detail screen of an item (as in the integrated version of the system) because the interim storage area is determined and posted to only in the R/3 System.

Screen for Planning Date/Time

You can, however, enter a planning date and time for transfer requirement processing on an additional screen. This screen only appears if an indicator is set in the table for movement type control (table 341 in the R/2 System). This data is also transmitted.

Dynamic Coordinate

The dynamic coordinate of the interim storage area is generated from the GR/GI document number for all goods. In this way, there is always a direct link between the interim storage quant and the posting transaction in Inventory Management.

Interim Storage Area Search in R/2 - R/3 Interface

You can facilitate interim storage area searches in the R/3 WM component the same as you would in the integrated WM component; that is, the WM movement type determines the storage bin for the respective interface (see Interim Storage Bins [Page 123]).

You activate this new type of interim storage area search at the warehouse number level. To define the search method for interim storage postings, see the section *Define decentralized link to R/2* in the *Warehouse Management IMG* documentation.

Account Assignment
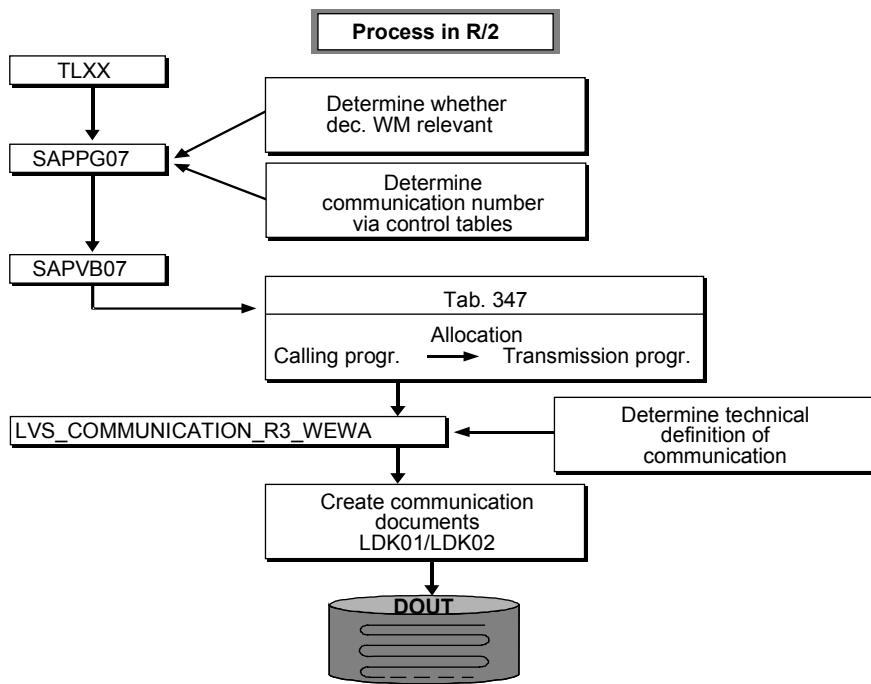
The R/2 account assignment (for example, purchase order, cost center) is copied into the transfer requirement as the R/3 requirement. In this way, you can process the transfer requirements for a particular account assignment (requirement).

Differences

Differences recorded during transfer order confirmation are transmitted to the R/2 System. This procedure is described in the section on R/3 → R/2 Processes [Page 533].

Technical Process in R/2

When a goods movement is recorded in R/2, the communication process is as follows:

```
                          ┌─────────────────────┐
                          │   Process in R/2     │
                          └─────────────────────┘
┌──────────┐              ┌─────────────────────────┐
│   TLXX    │              │   Determine whether      │
└──────────┘              │   dec. WM relevant       │
     │                    └─────────────────────────┘
     ▼                              │
┌──────────┐◄─────────────────────┘
│ SAPPG07  │◄─────────────────────┐
└──────────┘              ┌─────────────────────────┐
     │                    │   Determine              │
     ▼                    │   communication number   │
┌──────────┐              │   via control tables     │
│ SAPVB07  │              └─────────────────────────┘
└──────────┘
     │         ┌──────────────────────────────────────┐
     │         │            Tab. 347                    │
     └────────►│                Allocation              │
               │ Calling progr. ──────► Transmission progr. │
               └──────────────────────────────────────┘
                              │
                              ▼
┌───────────────────────────────────┐   ┌─────────────────────────┐
│ LVS_COMMUNICATION_R3_WEWA         │◄──│  Determine technical     │
└───────────────────────────────────┘   │  definition of           │
                    │                    │  communication           │
                    ▼                    └─────────────────────────┘
          ┌────────────────────────┐
          │ Create communication    │
          │ documents               │
          │ LDK01/LDK02             │
          └────────────────────────┘
                    │
                    ▼
                ┌───────┐
                │ DOUT  │
                └───────┘
```

Checking Whether Relevant for Warehouse Management

The system checks the entries in table 340 to determine whether the storage location is linked to an R/3 warehouse number.

Determining the LVS Movement Type

In table 341, the system finds the LVS movement type for the RM reference movement type as well as other information for Warehouse Management (for example, the stock category, the account assignment indicator, the transfer requirement indicator).

Creating the Data Extract

The system creates a data extract LD01 from the data to be transmitted from the GR/GI document. This data extract contains the relevant data from the RM document and data (for example, the special stock number) that is also determined automatically for the R/3 Warehouse Management component.

Determining the Transmission Program

Via table 347 the system processing task calls up the program that creates and transmits the communication document.

Determining the Receiver

Using table 342, the transmission program determines the communication number for the transaction activity key **001** and in table 343 finds the technical definition of the receiver and the type of transmission (automatic/manual).

It is possible to control the determination of the receiver using the movement type. In this way, individual movements can be handled differently. For example, you can have some goods

Goods Receipt / Goods Issue

movements (such as goods receipts for purchase orders) transmitted automatically and movements with lower priority transmitted at a later time (manually).

Creating the Communication Document

The transmission program creates the communication document LDK01 from the data extract LD01. Here the fields are converted to R/3 format automatically. The system reads table 344B in order to convert the R/2 account assignment type into the R/3 requirement indicator. The units of measure are decoded based on table 006Z.

Structure of the Communication Document
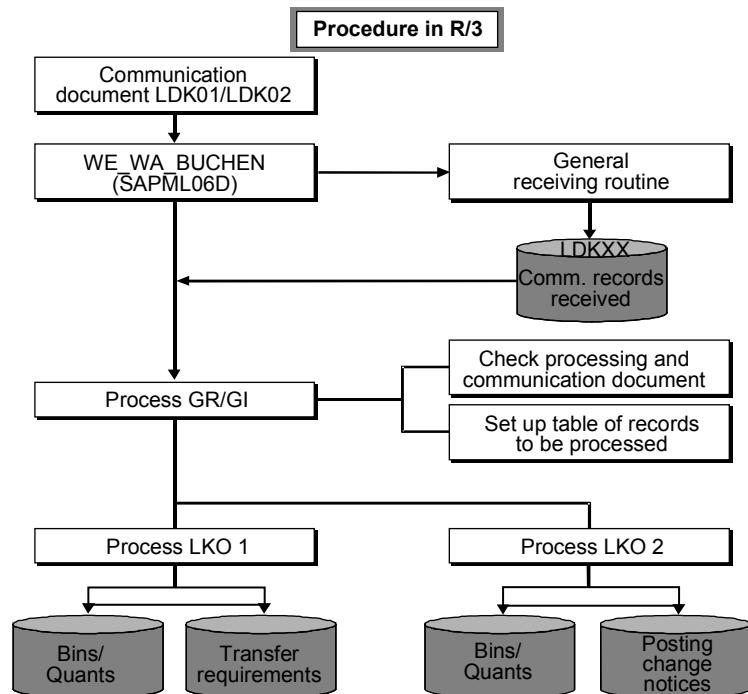
The communication document consists of records of the record type WM01. The system creates a record for each document item that is relevant for the warehouse. The first record is given the status **F** (First), and the last record is given the status **L** (Last). The status field remains blank for records located between the first and last positions in the communication document (see Status of Communication Records under the topic Record Types [Page 506].)

Transmitting the Communication Document

The communication document is transmitted either automatically or manually to the R/3 System as soon as the driver is activated.

Technical Process in R/3

If a communication document LDK01 is transmitted from the R/2 System to the R/3 System, this initiates the following actions in R/3:

Receiving the Communication Document

The communication document that is created in R/2 when a goods movement takes place is received in the R/3 System by a receiving routine and stored in table LDK01.

Status Record in Table LDK00

At the same time, the system writes a status record into table LDK00 that is used for managing the communication document.

Further Processing:
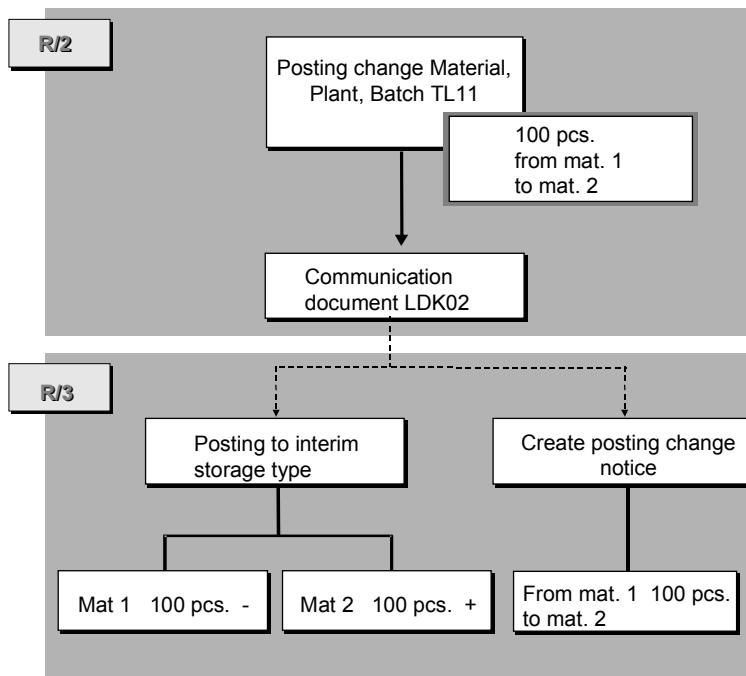
The individual records of the communication document are processed and checked by a further routine. The postings required for the goods movements are carried out automatically.

If an error occurs during the processing of a communication document, the corresponding communication document is noted in the status table LDK00 and the person responsible for the transaction receives a Mail message pointing out the error. See Mail Control in the R/3 System [Page 570].

Posting Changes in R/3

Similar to the procedure in the integrated R/3 System, a posting change for the R/2-R/3 link (for example, release of stock from quality inspection) is posted first in the Inventory Management (IM) component (as a transfer posting) and afterwards in WM. This posting initiates the following updates in WM:

- Two quants are posted to the posting change area:

  - a negative quant with the material identification of the stock to be cleared

  - a positive quant with the material identification of the stock to be posted.

- The system generates a posting change notice. This serves as a basis for the posting change transfer order.

Window for Goods Receipt Document

During the posting change transaction in Inventory Management, you can enter the goods receipt document to which the posting change refers. For example, when stock is released from inspection, you can enter the number of the originating document.

Technical Process

The only difference from other goods movements is that the communication document consists of LDK02 records (instead of LDK01 records for other movements).

See also:

Stock Transfers in R/3

A stock transfer involving the R/3 system is treated as either of the following, depending on the procedure used and the warehouse numbers involved:
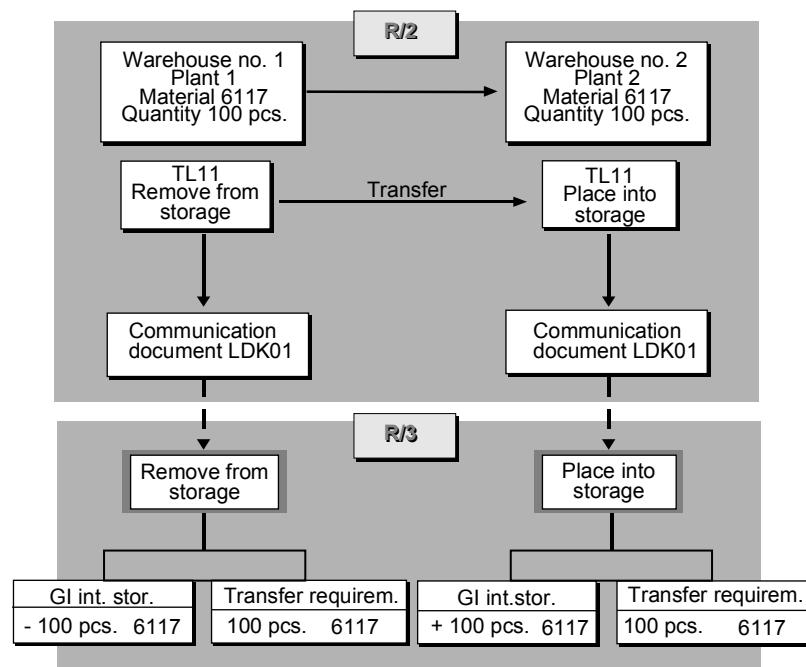
- Goods receipt or goods issue posting

- Posting change

Stock Transfer as Goods Receipt/Goods Issue Posting

A stock transfer that is executed with the two-step procedure is generally posted as a goods receipt or goods issue posting (see the figure below):

- Based on the stock removal (GI posting). a negative quant and a transfer requirement are automatically generated in Warehouse Management.

- Based on the stock placement (GR posting), a positive quant and a transfer requirement are automatically generated in Warehouse Management.

A stock transfer that is executed using the one-step procedure is treated as a GR/GI posting if different warehouse numbers are involved in the goods movement.
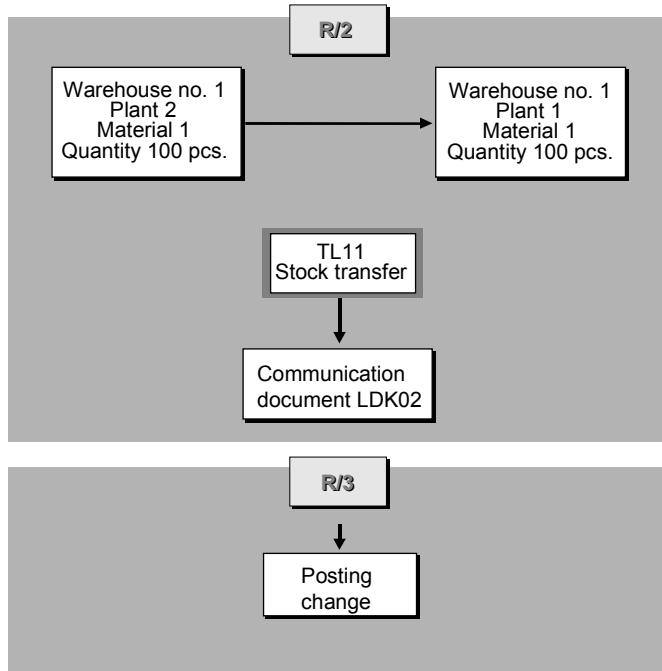
Two communication documents of the type LDK01 are created and transmitted for this movement.

The warehouse number in each communication document is determined from the plant/storage location issuing or receiving the goods.

Stock Transfer as Posting Change

A stock transfer with the single-step procedure is considered as a posting change if this movement takes place within a warehouse number. This is the case if two plants are linked to the same warehouse number.

For this type of movement, the system creates and transmits only one communication document of the type LDK02:

In the R/3 System, two quants are posted to the posting change interim storage area, and a posting change notice is also created.

See also:

WM Interface to Quality Management [Page 300]

Cancellation Posting

If a cancellation posting is necessary for the R/3 system, you need to cancel the posting in the system that **initiated** the transaction. If you entered a goods movement in the Inventory Management component first, then you should also post the cancellation in this component first.

If you want to cancel a goods movement in Inventory Management, you need to distinguish between the following situations:
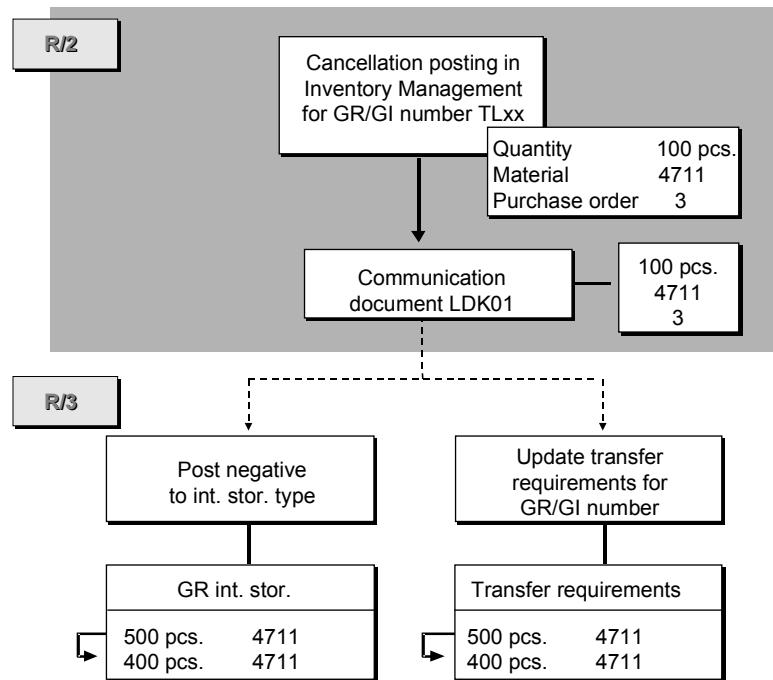
- Is the cancellation quantity still in the interim storage area? or

- Has a transfer order been created already?

Cancellation Posting Before Creating the Transfer Order

If the quantity concerned is still in the interim storage area, the following updates take place in Warehouse Management during the cancellation posting:

- The interim storage quant is adjusted by the cancellation quantity.

- The transfer requirement or the posting change notice is updated.

A cancellation posting which takes place before a transfer order has been created is illustrated below:
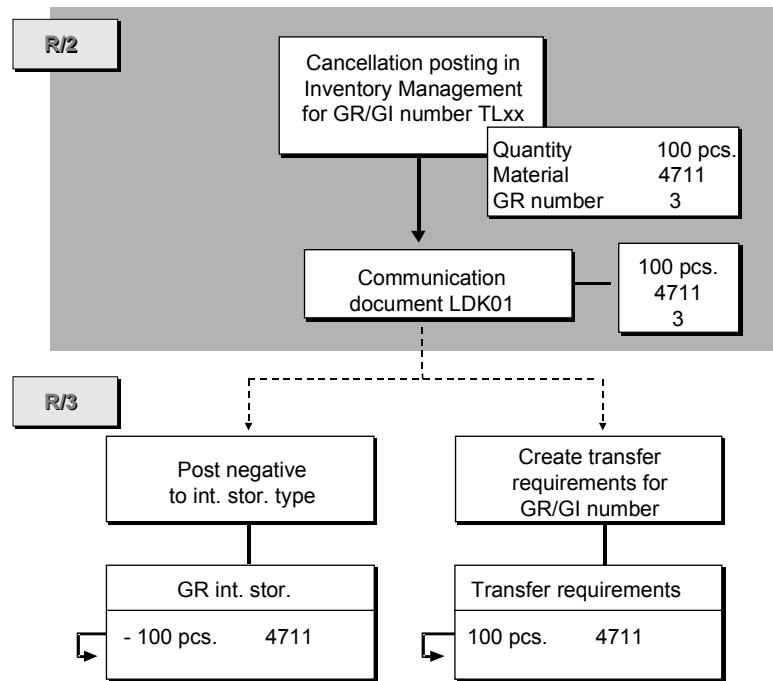
Cancellation Posting After Creating the Transfer Order

If the goods have already been transferred, the following updates take place in Warehouse Management:

- A new quant is posted to the interim storage area.

- A transfer requirement or a posting change notice is generated.

A cancellation posting which takes place after the creation of a transfer order is illustrated below:

For the cancellation posting, a transfer order with a reference to the transfer request or the posting change notice needs to be created.

It is also possible that a partial transfer takes place. In that case, it is a mixed process.

Entering the Cancellation Document

When you are entering the cancellation document in Inventory Management, you can enter the canceled document in an additional screen. This screen is displayed only if you set an indicator in the table for the movement type control. (See Connecting R/2 Movement Types to R/3 Movement Types [Page 560].)

R/3 -> R/2 Processes

This section describes transactions in the R/3 Warehouse Management component that initiate a communication process in the R/2 System, and shows how this communication process takes place. It contains the following topics:

Overview of R/3 → R/2 Processes [Page 534]

Stock Transfers from R/3 to R/2 [Page 536]
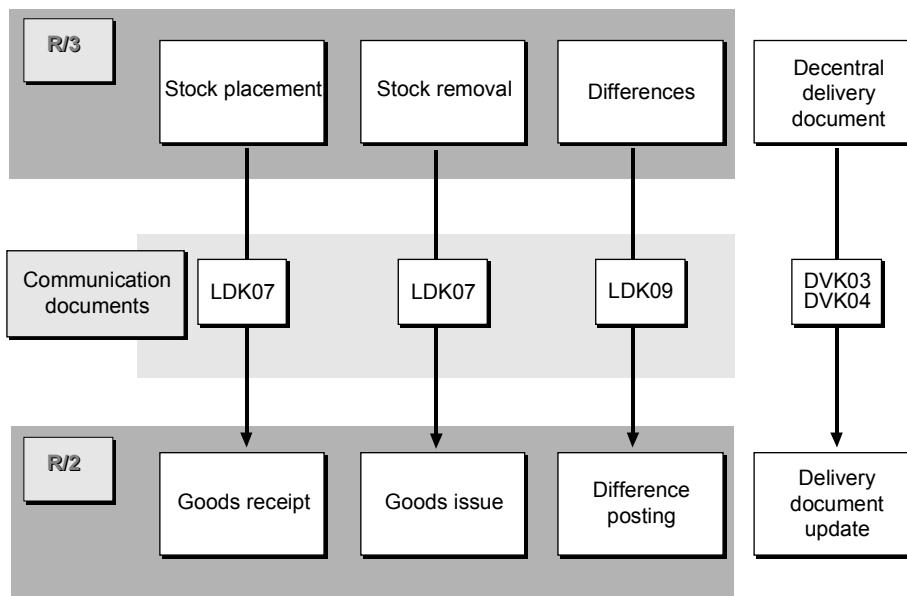
Recording Differences [Page 542]

Cumulative Transmission of Differences R/3 → R/2 [Page 545]

Overview of R/3 -> R/2 Processes

Communication from R/3 $\rightarrow$ R/2 takes place with the following transactions (see the figure below):

- Goods movements from Warehouse Management

- Confirmation of differences (with inventory differences)

- Transmission of picked quantities for R/2 deliveries

R/3	Stock placement	Stock removal	Differences	Decentral delivery document
Communication documents	LDK07	LDK07	LDK09	DVK03 DVK04
R/2	Goods receipt	Goods issue	Difference posting	Delivery document update

When is a Document Transmitted?

If there is a process from R/3 $\rightarrow$ R/2, the data can be transmitted in different ways:

- Manually

- Automatically (batch process)

- Cumulatively

Manually

Here the data to be transmitted is placed into a queue as soon as a transfer order has been processed. The data is then transmitted when the user manually activates the driver.

Automatically

The data transmission can be automated using batch processing. A batch job transmits the communication documents of a queue at regular intervals.

Cumulatively

Direct transmission of individual warehouse transactions means that each transfer order initiates an RM posting. If, for example, finished goods are delivered to production in pallets, a

Overview of R/3 -> R/2 Processes

communication record is transmitted to R/2 for each pallet and a goods receipt (GR) document is created.

For this reason, it is often advisable to execute the posting in Inventory Management for an accumulated quantity of material rather than for each transfer order individually.

With this type of data transfer, the WM stock of the posted material is accumulated in the interim storage record (for example, GR area with a dynamic coordinate based on the production order). The transfer can be manually initiated (via transaction LD11) or it can be planned (using report RLDLVS10) as a regular transfer with a variant to be processed in the background. A communication record is created for each material for the total interim storage quantity. The system transmits this quantity to R/2 and an RM document is generated automatically.

Material-Dependent Data Transmission

The type of transmission can be defined by material. For certain materials, such as slow-moving items, it is often necessary to have the available quantity updated in Inventory Management as soon as possible so that the material can be scheduled for requirements.

Other materials, on the other hand, can be transmitted on a cumulative basis so that the communication process is not overloaded and the number of RM postings is reduced.

Determining the Time of Communication

The time of communication is determined in the following manner:

- In the assignment table "Movement Type MM-WM R/3 - Host Activity" you set an indicator that determines whether the communication will take place immediately or depending upon each material. See Linking Activity Keys to Movement Types under the topic Sending Communication Documents from R/3 to R/2 [Page 575].

- If the communication time has been set based on materials, the system checks the warehouse data of the material to determine whether the indicator is set for immediate transmission.

    The system places the communication document into the queue. The document is then transmitted either automatically or manually.

    If the transfer order consists of several items and immediate transmission for a material has been set, the communication document is transmitted immediately.

Stock Transfers from R/3 to R/2

R/3 as the Leading System

The section R/2 → R/3 Processes [Page 511] is based on the assumption that the R/2 Inventory Management (IM) component is the leading system for posting a goods movement, that is, that each goods movement is posted first in IM, and then a transfer order is created in WM.

However, it is also possible to create the transfer order first in WM and then to execute the stock posting in R/2 afterwards.

Organizational factors can play a role in the decision to have WM as the leading component for certain transactions.

> If a company runs on a 24-hour operation basis, finished goods need to be taken from the production area and placed into storage in the warehouse. Since the host system is available for limited time periods only, such goods movements are first entered in WM. As soon as the Host system is active again, the goods movements are posted subsequently in IM. This takes place automatically via the interface.

No Checks

When goods movements are entered in WM, the system does not check the posting against data that are stored in the main system.

For this reason, certain transactions, such as goods receipts for purchase orders, should be posted in IM first so that data checks in R/2 can take place (for example, checking the goods receipt quantity against the ordered quantity).
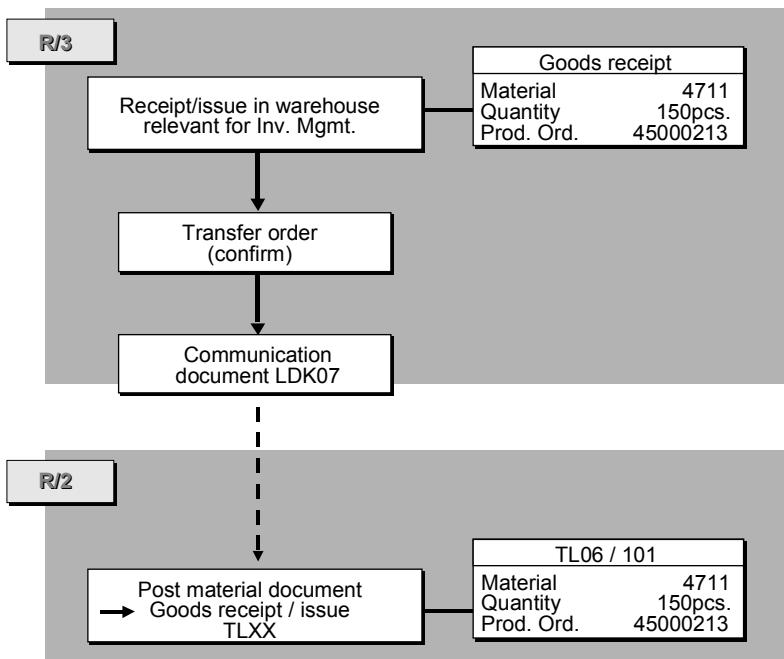
Material Availability

A goods movement is taken into account by the Material Requirements Planning department only after the RM document has been posted in Inventory Management. If there is a considerable time delay between the LVS posting and the RM posting, you must bear in mind that the material availability as stated by the system may deviate from the actual availability of the material.

General Process: Single Data Transfer

If a goods movement is posted first in Warehouse Management and then in Inventory Management, the process is as follows:

Stock Transfers from R/3 to R/2

1. In the R/3 System you post the transfer order for the stock placements and stock removals without a reference document. (Choose *TransOrder → Create → Without reference* from the WM menu bar.) As soon as the physical goods transfer has taken place, you confirm the transfer order.

2. During the confirmation procedure, the system determines that the transfer order is relevant for Inventory Management and that a communication process has to take place in order for the transferred quantity to be communicated to Inventory Management. The system does not post any quants to the interim storage record. Instead, it creates a communication document, which is then transmitted to the R/2 System either automatically or manually.

3. After the data transmission, the R/2 System creates a material document (GR/GI document) based on the communication document. This material document updates the stock quantities and values in Inventory Management.

General Process: Cumulative Data Transfer
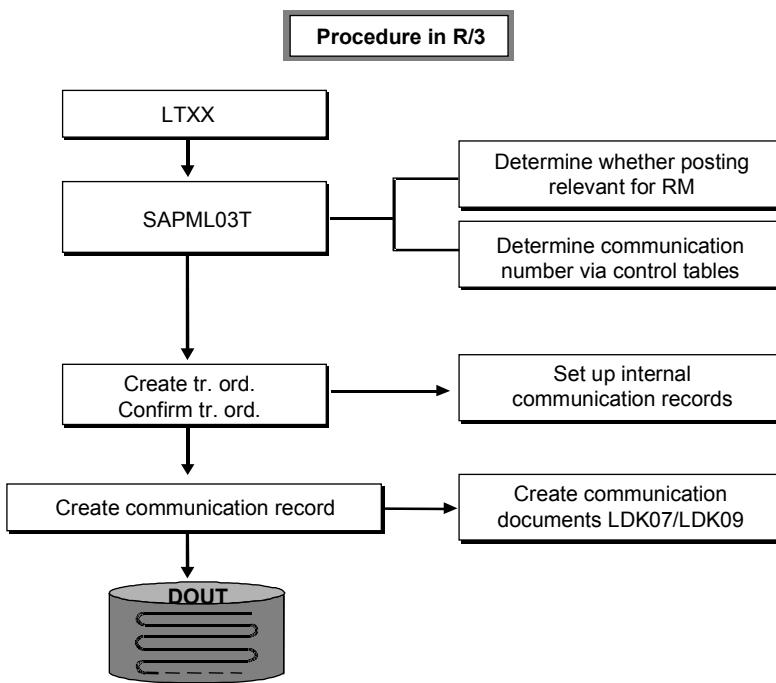
If you want to have the transfer data transmitted on a cumulative basis, the procedure is as follows:

1. In the R/3 System, you create transfer orders for stock placements and stock removals without a reference document. (Choose *TransOrder → Create → Without reference* from the WM menu bar.)

2. The system posts the quants to an interim storage record. If there is a stock placement coming from the production department, the quants are posted, for example, to a dynamic storage bin (coordinate = production order). Pallets of the same material are posted as one quant. The system does not create any communication documents for the transfer orders.

3. A report (RLDLVS10) that reads the interim storage quants is started at regular intervals. The system creates a communication record that is transmitted to R/2. (You can also use transaction LD11 for this process.)

4. After the communication record has been transmitted, the R/2 System creates a material document (GR/GI document) for each communication record. This document updates the stock quantities and values in Inventory Management.

Technical Process in R/3

If you post a goods movement in Warehouse Management first and then in Inventory Management, the communication process is as follows:

Creating a Transfer Order

When a transfer order is generated (without confirmation), the system posts quants to the interim storage area for each transfer order item. For example, the quant for the source item is posted to the interim storage area for goods receipts.

At this point, no communication takes place because the transfer order must be confirmed first.

Checking Communication Relevance

During confirmation (or creation of transfer orders with simultaneous confirmation), the system checks on the basis of the movement type whether the stock placement or stock removal concerned is relevant for Inventory Management and whether the data should be transferred on a single or cumulative basis.

Creating the Communication Document

The system creates a communication document of the type LDK07 from the data to be transmitted.

Stock Transfers from R/3 to R/2

Single Data Transfer

The system creates a communication record of the record type WM07 for each transfer order item. This record contains both the transfer order header data as well as the item data (interim storage item).

If an interim storage quant was posted when the transfer order was created, the system clears this quant during the confirmation procedure.

No quant is posted to the interim storage area because the goods transfer data (material, quantity, and so on) are transmitted to the R/2 System via the communication document.

Cumulative Data Transfer

When a transfer order is created, the system automatically posts quants to the interim storage area. During the confirmation procedure, these quants are not cleared and the system does not create a communication document right away.

In order to create the communication document, you need to initiate a report that reads the interim storage quants and creates a communication record for each material. Only then will the interim storage quants be cleared.

Determining the Receiver

If a communication process is to take place, the system determines the communication number for the respective warehouse number, for transaction activity key **001**, and for the movement type in a control table (Control of Single Transactions).
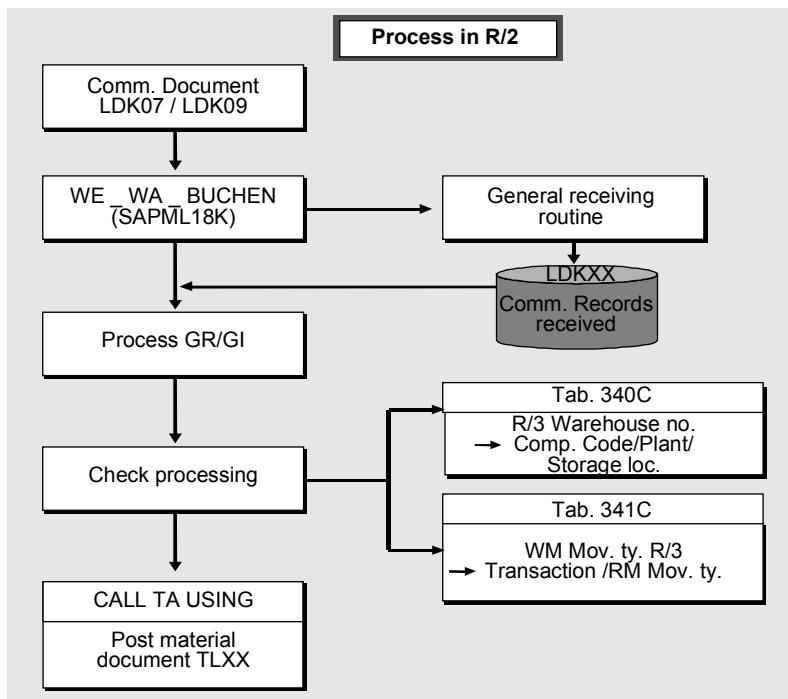
Using the communication number, the system finds the queue ID in another control table (Communication Numbers). The receiver is defined here.

Transmitting the Communication Document

The communication document is placed into the queue and transmitted to the R/2 System either automatically or manually.

Technical Process in R/2

If a communication document of the type LDK07 is sent to the R/2 System, this initiates the following actions in R/2:

Receiving the Communication Document

1. The communication document is received in R/2 by a receiving routine and stored in table LDK07.

   At the same time, the system makes an entry in the status record LDK00, which is used to manage the communication document.

2. The communication records are processed and checked by a further routine.

3. Via table 340C, the system determines the company code, plant and storage location that are linked to the R/3 warehouse number.

4. Via table 341C, the system uses the R/3 movement type to determine the transaction and the movement type for the material posting. The standard system supports only transactions TL06 and TL11.

   The R/3 fields of the communication document are converted to R/2 format.

   An LDK00 record is created and the goods movement is posted in the R/2 System.

5. The system posts the goods movement in IM. It records the number of the communication document in the field Material Document (TL11) or in the field *Delivery* (TL06).

No Interim Storage Posting

When the material document is created, the system determines that the material document was generated by the R/3 Warehouse Management component and does not create a communication document. As a result, neither an interim storage quant nor a transfer requirement is created in Warehouse Management.
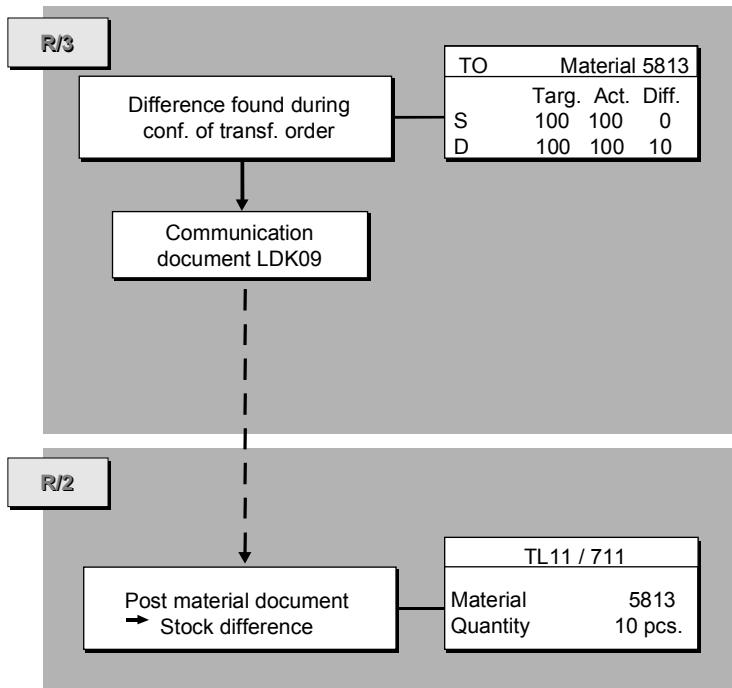
Recording Differences

Differences that are recorded during the confirmation of a transfer order or during inventory must be cleared in Inventory Management.

This applies regardless of the sequence in which the goods movement is posted (Inventory Management before Warehouse Management or vice versa).

Similar to the R/3 → R/2 processes, the differences can be transferred to Inventory Management either individually per warehouse movement or in accumulated form.

General Process

The general procedure is as follows:

1. When you confirm a transfer order, enter the difference quantity.

2. During the confirmation procedure, the system determines that the difference needs to be transferred to Inventory Management, and therefore creates a communication document. The communication document is then transmitted to the R/2 System either manually or automatically.

   If data is transferred on a cumulative basis, the quants are first posted to the interim storage area for differences. In this case, you need to start a report that reads the interim storage quants and creates a communication document.

3. After the data transfer, the R/2 System creates a material document based on the communication document. This material document updates the stock quantities and values in the R/2 system.

Recording Differences

Technical Process in R/3

If a difference is entered during the confirmation of a transfer order, the difference data is recorded in the transfer order and then needs to be transmitted to the R/2 System.

Determining the Receiver

The system determines the communication number for the warehouse number, the transaction, and the movement type.

Using the communication number, the system determines the queue ID under which the receiver is defined.

Creating the Communication Document

A communication record LDK09 (record type WM09) is created from the difference item for the difference posting.

Difference for an R/2 → R/3 Transaction

If the difference is recorded for a transaction that is posted first in Inventory Management and then in Warehouse Management, the communication document only contains communication records of the record type WM09.

Difference for an R/3 → R/2 Transaction

If the difference is recorded for a transaction that is posted first in Warehouse Management and then in Inventory Management, the communication record for transmitting the difference data is an integral part of the communication document that is created when the transfer order is being confirmed.

The communication document in this case consists of communication records of different record types:

- WM07 for transmitting transfer quantity data
- WM09 for transmitting differences

Transmitting the Communication Document

The communication document is placed into the queue and transmitted to R/2 either automatically or manually.

No Interim Storage Area for Differences

Since the difference is transferred to Inventory Management directly, no quant is posted to the interim storage area for differences.

Technical Process in R/2

If a communication document with a communication record WM09 is transmitted to R/2, this initiates the following actions in the R/2 System:

Receiving the Communication Document

1. The communication document is received in R/2 by a receiving routine and then stored in table LDK09.

   At the same time, the system makes an entry in the status record LDK00, which is used for managing the communication document.

2. The system determines the RM movement type for transaction TL11 in table 304 on the basis of the stock category.

3. Based on the communication record WM09, the system posts a material document for the difference posting using the CALL TRANSACTION.

No Interim Storage Posting

When the material document is being created, the system determines that the document is created by the R/3 Warehouse Management component. No communication document is created and, therefore, no quant posted to the interim storage area for differences.

Differences in Source Storage Bin for Transmissions to R/2

However, for goods receipts (for example, from Production Planning), it is generally better to establish the quantity actually produced by adjusting the stock quantities in the source storage bin. This is necessary because the exact quantity to be produced is not always known. This often results in partial pallets.

Using the SAP WM component, It is possible to transmit the actual quantity to the R/2 System, that is, the target quantity is corrected to the actual quantity based on the difference in the source storage bin.

This type of transmission to the R/2 System must be activated as an individual processing control based on the movement type. For processing in R/3, activate the Field *Diff.in source bin* under *Individual processing controls for R/3 to R/2 Communication* in the *Define decentralized link to R/2* section of the *Warehouse Management IMG*.

Cumulative Transmission of Differences R/3 -> R/2

The aim of cumulative transmissions from the R/3 System is to accumulate inventory differences (or even goods movements) and then to transmit them all at once to the R/2 System.

There are three relevant tables in the R/3 System:

Control of individual processing: "Movement Type *Decentral.MM-WM* → *Host Activity*"

Control of multiple processing: "Accumulated Messages for the Host (R/2)"

R/3 movement types

You define these tables using the *Warehouse Management IMG*. To maintain the first two tables, choose *Interfaces* → *Define decentralized link to R/2* and then the appropriate table from the list of objects. To maintain R/3 movement types, choose *Activities* → *Transfers* → *Movement types*.

General Process

Quants are collected in an interim storage area.

The ABAP RLDLVS10 reads the data about the quants and creates one transfer order per quant.

The transfer order decreases the quantity in the interim storage area and creates a communication document that is sent to the R/2 System over the normal CPI-C interface.

The following factors regarding negative and positive quants in the interim storage area apply:

Negative Quant in the Interim Storage Area

Indicates (a difference for) a goods receipt into the warehouse (resulting from a transfer order for a putaway).

From: the interim storage area (for cumulative transfers) (-)

To: a storage bin in the warehouse (+)

Positive Quant in the Interim Storage Area

Indicates a goods issue from the warehouse (resulting from a transfer order for a pick).

From: a storage bin in the warehouse (-)

To: the interim storage area (+)

Posting Control

To control the postings for the interim storage area, there are two possibilities:

Easy Method

Define a movement type for the goods movement, but do **not** include it in the table for "Control of individual processes". In the movement type itself, you must define to which storage type the goods are to be sent.

Material-Dependent Method

For all goods movements, the data is transferred directly to the R/2 host unless a specific material has been defined otherwise.

For this process, the movement type must be in the table for "Control of individual processes". In that table, depending upon the direction of movement, you enter **2** in the Source items or Destination items fields accordingly. The system still looks in the material master record and creates communication documents only for materials where the Message to IM check box is marked. For more information about the control of individual processes table, see Sending Communication Documents from R/3 to R/2 [Page 575].

Sending the Quants to Inventory Management

To transmit the quants to Inventory Management in the R/2 System, you use the report RLDLVS10 as follows:

Choose *System* → *Services* → *Reporting* from any menu bar and choose ENTER.

Enter **RLDLVS10** in the *Program* field and choose *Execute*.

Enter the warehouse number and storage type for the accumulation interim storage area and choose *List* → *Clear online foreground* or *List* → *Clear online background.*

> For each quant, the system creates a transfer order that clears the interim storage area. The creation of the transfer order results in the creation of a communication document that is then transmitted to the R/2 System.

How are the Transfer Orders Created?

The movement type in the table "Control of multiple processes" is used to create the transfer orders when report RLDLVS10 is executed.

The table below illustrates how this table can be set up to control multiple processing for differences.

Accumulated Messages for the Host (R/2)

WNr	Type	MvtTyp+	MvtTyp-	Differences
111	999	720	719	x
111	999	820	819	

To define these movement types see *Activities* → *Transfers* → *Movement types* in the *Warehouse Management IMG* documentation.

For negative quants, the movement type creates a transfer order for a putaway. The movement type "-" (minus) unburdens, so to speak, the source item in the transfer order.

For positive quants, the movement type creates a transfer order for a pick. The movement type "+" (plus) unburdens, so to speak, the destination item in the transfer order.

Where do the transfer orders get their data?

Since the ABAP reads the interim storage area, the correct data (including the requirement tracking number) is automatically retrieved for each of the quants.

Set-up for Inventory Differences Storage Type 999 [Page 548]

Set-up for Cumulative Postings for Goods Receipts and Goods Issues [Page 550]

Set-up for Inventory Differences Storage Type 999

To configure your system for cumulative transfer of differences from R/3 to R/2, you must set up the tables in the following order:

1. Define a new interim storage area (for example, storage type 980) for cumulative transfers.

   This storage type should include Mixed storage and Addition to existing stock for stock placement controls and Negative stock and Posting changes in same bin for stock removal controls.

2. Define a storage section (for example, 001) for the storage area.

3. Define a storage bin (for example, TEMP) for the interim storage area.

4. Define two new movement types to be used for the transfers.

   Using the movement types shown in the first line of the accumulates messages table above as examples, you need to define movement types with the following characteristics:

   Movement Type 719

   Inventory difference for stock placements

Src   **980**   **TEMP**

Dest   **980**

Transfer type   **E** Stock placement
TO Creation Screen   **3** Single item screen
GR data in quant

   Confirm immediately

   Movement Type 720

   Inventory difference for stock removals

Src   **980**

Dest   **980**   **TEMP**

Transfer type   **A** Stock removal
TO Creation Screen   **3** Single item screen
GR data in quant

   Confirm immediately

5. Add the new movement types to the table "Control of individual processes"

   For movement type 719 (activity key 001), enter **1** in the Source items field (directly to R/2).

   For movement type 720 (activity key 001), enter **1** in the Destination items field (directly to R/2).

Set-up for Inventory Differences Storage Type 999

6. Add the new movement types to the table "Control of multiple processes" (as shown in the first line of the table below).

Accumulated Messages for the Host (R/2)

WNr	Type	MvtTyp+	MvtTyp-	Diff ID
111	999	720	719	x
111	999	820	819	

Example: Set-up for Cumulative Postings

To configure your system for cumulative transfers for goods receipts and goods issues from R/3 to R/2, steps 1 through 6 above are the same. You set up the tables in the following order:

1. Define a new interim storage area (for example, storage type 904) for cumulative transfers.

2. Define a storage section (for example, 904 001) for the storage area.

3. Define a storage bin (for example, TEMP) in 904 001.

4. Define two new movement types to be used for the transfers. For example:

   Movement Type 819

   Src   904   TEMP

   Dest   904

   Movement Type 820

   Src   904

   Dest   904   TEMP

5. Add the new movement types to the table "Control of individual processes"

   For movement type 819 (activity key 001), enter **1** in the Source items field (directly to R/2).

   For movement type 820 (activity key 001), enter **1** in the Destination items field (directly to R/2).

6. Add the new movement types to the table "Control of multiple processes" (as shown in the second line of the accumulated messages table above).

7. In addition: Define a movement type for goods receipts and goods issues postings in R/3.

   This movement type is optional and should be used when communication documents are to be transmitted immediately to R/2 based on the material or when the quantities are to be sent cumulatively to the R/2 System.

Bi-directional Processes

This section describes delivery processing which requires a bi-directional data exchange. It contains the following topics:

Connection to the Shipping Component [Page 552]

Setting up the Shipping Control Tables [Page 553]

Relationship of R/3 Shipping to WM [Page 554]

Multiple Processing for Deliveries [Page 555]
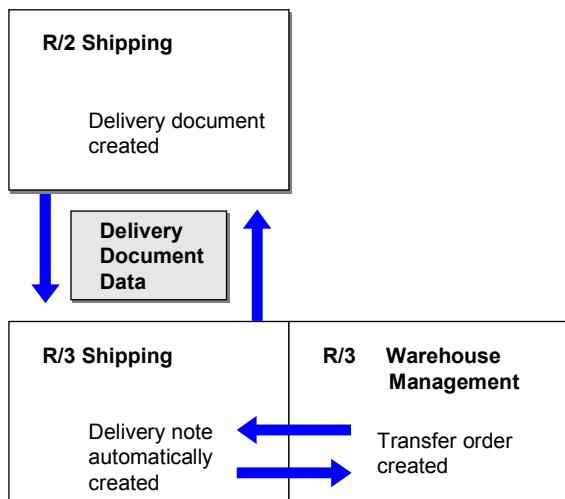
The R/2-R/3 Link to Shipping is discussed in the R/3 SD Shipping Guide [Ext.] and in the R/2 System Description "Decentralized Shipping" Form V04.2/4 Release 5.0. For information about configuring the R/2-R/3 Shipping link, refer to the SD Shipping Implementation Guide.

Connection to Shipping

Processing in R/3 Shipping makes it possible to carry out all shipping activities without an active connection to a central sales system. As with the R/3 WM system, this permits processing of shipping activities even when the host system is not available.

Bi-directional Process

1. Delivery data is transmitted from the R/2 RV Shipping component and received by a receiving program in the R/3 SD Shipping system.

2. In the R/3 System, deliveries are automatically created for the SD Shipping system.

3. Via an interface to WM, a transfer order is created for the delivery and passed back to the SD system.

4. The SD system then transmits a communication document with the appropriate data back to the R/2 RV Shipping component where it is posted.

5. Goods issues in the R/2 Inventory Management system are updated as described in R/2 → R/3 Processes [Page 511].

```
R/2 Shipping

    Delivery document
    created

       Delivery
       Document
       Data

R/3 Shipping       R/3    Warehouse
                          Management

   Delivery note              Transfer order
   automatically              created
   created
```

Analyzing Communication Documents Received in Shipping

Procedures used to evaluate and process communication documents and errors which result from using the Shipping component are exactly the same as for WM.

For a complete description of these procedures, see The Analysis Tool [Page 566].

Setting up the Shipping Control Tables

Although some tables used in R/3 Shipping may not directly link that system to WM, it is still necessary to maintain them so that deliveries can be properly processed in WM. These tables link the R/2 System with the Shipping component in R/3.

R/3 Shipping Control Tables

Table	Function
633A	Connects the company code, plant, shipping path in R/2 to the plant, shipping point, shipping requirements and logical receiver in R/3
633B	Connects the company code and sales area in R/2 to the sales organization, sales path and division in R/3
633C	Connects the R/3 delivery type to the R/2 delivery type
633D	Used for converting storage types in the R/2 System to storage types in the R/3 System
633E	Used for conversion of storage conditions in transportation groups and loading groups

Once these tables have been maintained, the indicator in the delivery header for R/3 shipping is automatically set when the delivery is created. Processing is carried out accordingly.

Relationship of R/3 Shipping to WM

When an R/3 Shipping component is connected to the R/2 host in conjunction with an R/3 Warehouse Management system, all deliveries are processed in WM in exactly the same manner as in the integrated system. For complete information about this topic, see Goods Issues Based on a Delivery [Page 220].

General Process

In the R/2 system you create material master records and delivery documents based on sales orders or scheduling agreements.

1. The section R/2 → R/3 Processes [Page 511] explains how material master records are sent to the R/3 System for further processing.

2. Delivery documents are also transmitted to the R/3 System to be processed in the SD and WM components.

3. When the processing is complete, the communication documents with the completed delivery data are retransmitted to the R/2 System.

To post goods issues for deliveries WM supports the random picking technique.

For more information about the random picking technique, seeExample: Creating a Transfer Order in WM without a Previous Posting in IM [Page 209].

Multiple Processing for Deliveries

As with transfer requirements, you also have the possibility to create several deliveries using multiple processing in the R/3 WM component. The procedure is basically the same as multiple processing of transfer requirements. You can assign several deliveries to a group and then create transfer orders and print the associated documents using the group number.

This procedure is described in Releasing Stock from Inspection in IM [Page 205].

Communication Administration

This section is intended primarily for system administrators. It contains instructions on how to set up your system to manage communication documents that are transmitted between the R/2 host system and the R/3 Warehouse Management system.

This section is separated into three main parts with topics that pertain to each part as follows:

PART 1: R/2 → R/3 Processes [Page 557]

PART 2: R/3 → R/2 Processes [Page 572]

PART 3: Additional Information [Page 582]

PART 1: R/2 -> R/3 Processes

This section contains topics that primarily describe processes involving the transfer of data from the SAP R/2 Host System to the SAP R/3 System.
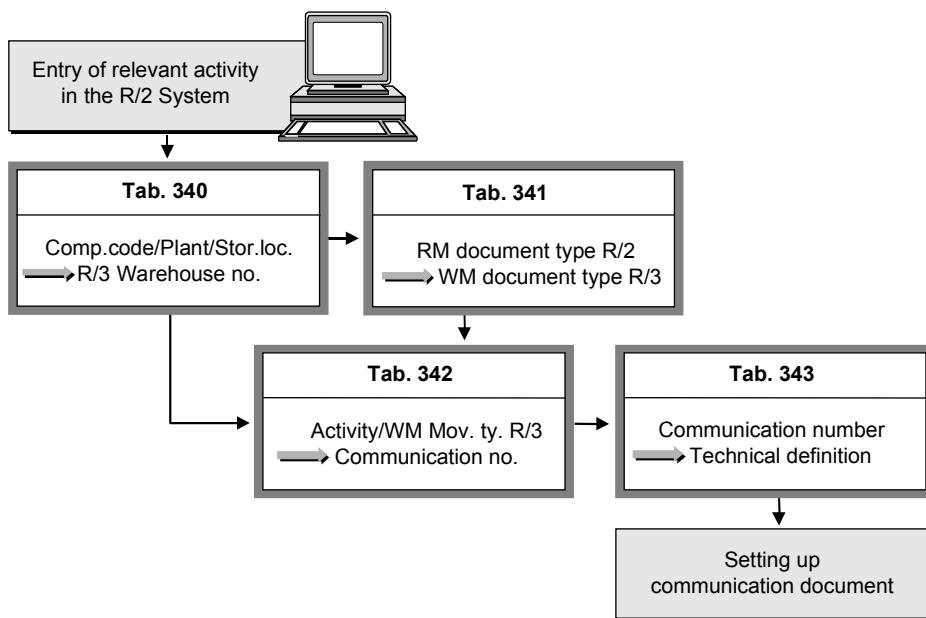
Setting up the R/2 Control Tables

Before any communication can take place between the R/2 host system and the R/3 Warehouse Management system, you must first link the partner systems together.

> Depending upon the system configuration (hardware, operating system, DC system, network, gateway, and so on), communications must be set up for each side of the system. In this section, we explain how to set up application-specific tables for your system.

There are several control tables in the R/2 System that are used to create communication documents that are then transmitted to the R/3 System. As an example, we will describe four important tables.

```
┌─────────────────────────────┐
│ Entry of relevant activity  │
│ in the R/2 System           │
└─────────────────────────────┘
            │
            ▼
┌──────────────────────┐     ┌──────────────────────┐
│      Tab. 340        │     │      Tab. 341        │
│                      │     │                      │
│ Comp.code/Plant/     │ ──► │ RM document type R/2 │
│ Stor.loc.            │     │  ──► WM document     │
│  ──►R/3 Warehouse no.│     │      type R/3        │
└──────────────────────┘     └──────────────────────┘
            │                            │
            │                            ▼
            │      ┌──────────────────────┐     ┌──────────────────────┐
            │      │      Tab. 342        │     │      Tab. 343        │
            │      │                      │     │                      │
            └────► │ Activity/WM Mov. ty. │ ──► │ Communication number │
                   │ R/3                  │     │  ──►Technical        │
                   │  ──► Communication   │     │      definition      │
                   │      no.             │     │                      │
                   └──────────────────────┘     └──────────────────────┘
                                                            │
                                                            ▼
                                                ┌──────────────────────┐
                                                │    Setting up         │
                                                │ communication document│
                                                └──────────────────────┘
```

> A goods receipt in the R/2 Inventory Management (IM) system is to be communicated to the R/3 Warehouse Management (WM) system. The posting takes place in Company Code 01, Plant 01 and Storage Location 87 via transaction TL01 and movement type 101.

Process Initialization

Table 340 in the R/2 System initializes the communication to the R/3 WM system.

Setting up the R/2 Control Tables

In our example, the system finds a corresponding entry in table 340 and identifies this posting as relevant for the R/3 system. R/3 Warehouse Number 111, R/3 Plant 0001 and Language E are assigned for this posting.

Table 340 in R/2
Process Initialization

CoCode	Plnt	St.Loc	R3 WhNr	R3 Plnt	R3 Lang
01	01	87	111	0001	E
01	03	01	111	0003	E

Linking RM-MAT to Warehouse Management

Instead of taking the RM movement type from table 156, the system accesses table 341 to find the reference movement type and other indicators.

The following data is provided:

- Movement type for WM

- Stock category for the quants created by the movement

- Indicators controlling the creation of transfer requirements and posting change notices

Table 341 serves, therefore, as a connecting link between the R/2 Inventory Management system and R/3 Warehouse Management.

Connecting R/2 Movement Types to R/3

The following table illustrates how movement types in the R/2 Inventory Management (IM) system are connected to movement types in the R/3 WM system.

Table 341 in R/2

Reference Movement Type Links

R/3	REF	MTy	
WNo	156	LVS	Text
XXX	101	101	GR PURORDER
XXX	101	101	GR PURORDER
XXX	102	102	GR PO STORNO
XXX	103	103	GR PRODORDER

The first entry in table 341 above is the relevant entry for our example. Here, the following assignments are made:

- WM movement type 101

- Stock category of readily available

- Account assignment to the purchase order number

- Set goods receipt date for quants

- Create transfer requirement in R/3 WM

Activity Keys

Activity keys are assigned to communication numbers in table 342.

In table 342 illustrated below, the activity key 001 is used for processing communication documents for goods movements transactions using communication number WMK10, whereas activity key 003 is used to process communication documents for material master records.

Table 342 in R/2

Activity Keys

WhseNr	ActKey	ComNo	ID:dir	(Transaction)
111	001	WMK10	X	(Goods receipts/issues)
111	003	WMK30	X	(Create Mat.Master)

Defining the Receiving System

In the R/2 System, table 343 is used to define the receiving system.

Connecting R/2 Movement Types to R/3

Table 343 in R/2

Definition of Receiving System

Com No	TgtSys	Appl	Clnt	Program Module.................	
				User Name Password	
WMK 10	CK94	K11	000	SAPML06D WE_WA_BUCHEN CPIC2	A
WMK 30	CK95	K11	000	SAPML06D MAT_BUCHEN CPIC2	M

The module WE_WA_BUCHEN must be identified as illustrated in the above table for the system to address the proper R/3 transaction for posting goods receipts and goods issues.

Using communication numbers, you establish the parameters that are used to define the partner system. With the "Target System" and "Application" parameters, you define the communication at the logical-technical level. The rest of the parameters pertain to the application-specific definition of the communication.

By varying the definitions of the communication numbers, you describe corresponding queues. These queues provide you with the capability to send selected communication documents over separate channels (for example, at separate times).

In column S (start transmission of communication documents), two entries are possible:

> **M** = manual transmission of communication documents

> **A** = automatic transmission of communication documents

For our example, entries in the first line are relevant (see table "Definition of Receiving System" above. The entries "Program SAPML06D" and "Module WE_WA_BUCHEN" cause the receiving routine that is responsible for goods receipts and goods issues to be called up on the R/3 side.

Queue Management in R/2

As described in the General Communication Process [Page 494], when communication documents are sent from the R/2 host to the R/3 system, it is always an asynchronous process. They are assigned to a DOUT file (queue) and the system attempts to send them as soon as the receiving system becomes available. As described in the previous section, you can establish whether this process is automatic or manual.

Queue Maintenance

To list communication documents that have been created and are still active in a queue in the R/2 System

1. Execute transaction TMQM by entering **ntmqm** in the OK field and choose ENTER.

2. Choose F11 to display a list of the existing queues in the system.

    The number of communication documents for a queue are listed in the TrNr column.

    From this list, it is possible to start the driver to start the program to transmit communication documents from the DOUT queue to the R/3 System (see "Transmitting Communication Documents Manually" below).

3. To display a list of communication documents (sentences) of a queue, position the cursor on the desired line and choose F12.

4. To list the contents of a communication record, position the cursor on the desired line and choose F2.

    The structure of the record displayed is based on a corresponding data dictionary structure.

Communication Record Structure in R/3

The data dictionary structure for communication records in the R/3 System is exactly the same as in the R/2 System.

To display the list of fields for a communication record in the R/3 System

1. Choose *Tools → ABAP Workbench → Development → ABAP Dictionary* from the SAP main menu bar.

2. On the screen that appears, enter **ldk01** in the *Data type* field, and choose *Display*.

Transmitting Communication Documents Manually

If the communication number in R/2 is defined so that communication documents are transmitted manually, and not automatically, to the R/3 System, the driver must be started manually for the corresponding queue (see table 343 under Connecting R/2 Movement Types to R/3 [Page 560]).

To send communication documents manually from the R/2 host to the R/3 system

1. Execute transaction TMQD ("APPC Management Information") by entering **ntmqd** in the OK field and choose ENTER.

2. Enter **x** in the field to the left of the relevant queue(s). If you do not know which queue(s) to select, check table 343 to see which queue is used for the selected process (communication number).

Queue Management in R/2

To select only one queue, you do not have to enter **x** to the left of the queue. Instead, position the cursor anywhere on the desired queue line.

3. Choose `F17` (Start driver) to start the program to transmit communication documents from the DOUT queue to the R/3 System.

4. Choose `ENTER` to display the current status.

   A **Y** appears in column A under "Shipping" of the selected line to indicate that the driver is active. This indicator remains until all communication documents in the queue have been sent successfully.

5. If, when you choose `ENTER` again, the line has disappeared, it means that the communication documents in the queue have arrived in the receiving system.

When the communication documents are received in the R/3 System, R/2 is notified that they have arrived successfully and they are physically deleted from the R/2 System.

> For further information about this topic, see the SAP Communication: Programmer Handbook, Systems R 4.3/5.0, Form S45.2.

Receiving Communication Documents in R/3

In the test phase as well as in a productive system, the system manager should periodically check the operation of the system communications. To do this, a regular plan should be established to determine whether communication documents have been received without errors in the R/3 system and to carry out necessary updates.

Errors when Receiving Communication Documents

If errors are found (for example, no transfer requirement exists in the R/3 System for a stock movement that was posted in the R/2 System), you must determine whether the problem is a communication document transmission error (in the CPI-C) or an error in the operation of the Warehouse Management application. You can check this easily by displaying a list of communication documents in the system in which the documents were received.

Analyzing Errors

To identify and analyze errors that occur in the system, three tasks are available:

- Mail messages

- System log

- Analysis tool

To use these tasks, choose *Logistics → Logistics Execution → Internal Whse Processes → R/2-R/3 Link → Error Analysis* from the SAP menu.

From the *Error Analysis*, continue as follows:

1. To identify errors that occur during the transmission of communication documents, choose *Error analysis → Incoming mail*.

2. To analyze the system log, choose *Error analysis → System log.*

3. To display and analyze communication documents that have been received from the host system, choose *Error analysis → Evaluate commun.doc*.

These tasks are discussed in more detail under the topics The Analysis Tool [Page 566] and Mail Control in the R/3 System [Page 570].

Technical Errors

If the error is a communication error (CPI-C), it is known as a *technical* error. To resolve technical errors, the communication path must be checked. For detailed information about the CPI-C interface, refer to the BC SAP-Communication: Programming Guide.

Logical Errors
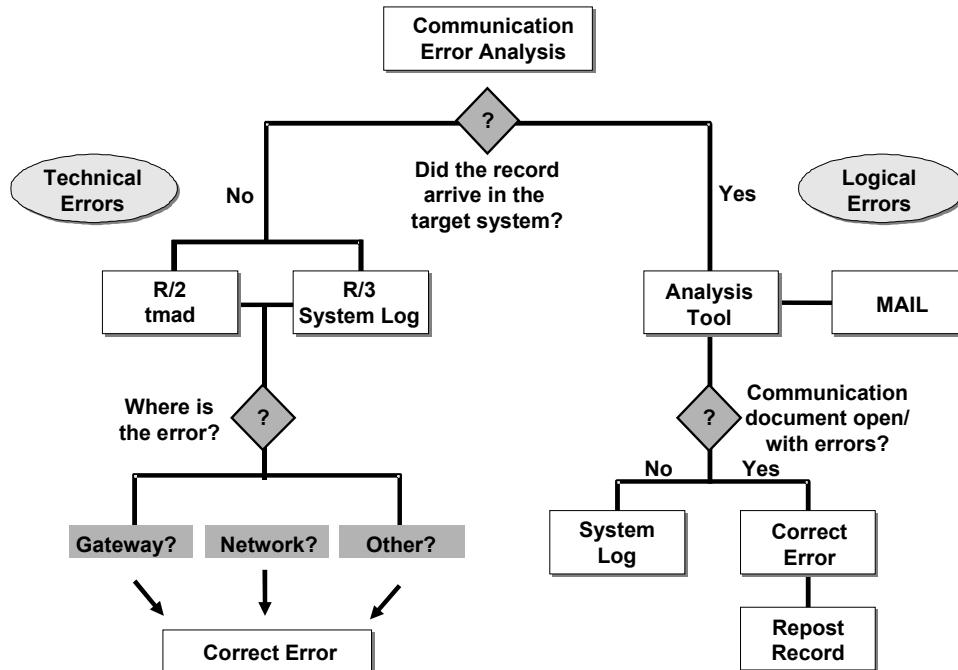
If the error is an applications error, it is known as a *logical* error (for example, an incorrect entry in a table or missing information in the material master record). For instructions on how to analyze and correct logical errors, see The Analysis Tool [Page 566].

Once you have corrected logical errors, you must repost the communication document to ensure that all necessary updates are carried out by the system.

Receiving Communication Documents in R/3

Where to Look When Errors Occur

When errors occur, it is not always easy to figure out what caused them and where to look to correct them. The following chart in provides a logical sequence of actions and possibilities as to how to analyze and correct most errors that occur when working with the R/3 system. These same procedures can be followed to identify errors that occur when transmitting communication documents regardless of the source or target systems.

```
                        Communication
                        Error Analysis
                              │
                              ◇ ?
              ┌───────────────┴───────────────┐
              No        Did the record        Yes
  Technical             arrive in the               Logical
  Errors                target system?              Errors
              │                               │
       ┌──────┴──────┐                        │
    R/2           R/3                  Analysis ──── MAIL
    tmad          System Log           Tool
              │                               │
  Where is    ◇ ?                      ◇ ?   Communication
  the error?                                  document open/
       ┌──────┼──────┐                No  Yes with errors?
   Gateway? Network? Other?        ┌────┴────┐
       ↘      ↓      ↙           System    Correct
                                  Log       Error
      Correct Error                           │
                                           Repost
                                           Record
```

The Analysis Tool

The analysis tool displays an overview of communication documents received from the R/2 system. It provides you with information on whether the communication documents received from the partner system could be processed.

In the analysis tool, the overview lists the

- Total number of communication documents received

- Number of communication documents that were processed correctly

- Number of communication documents that are open (yet to be processed)

- Number of communication documents that could not be processed and are marked "in error"

The overview may contain one or more of the following communication record types:

- Delivery documents

- Goods receipt/Goods issue/Posting changes

- Material master record documents

From this evaluation list, you can

- Retrieve information about the contents of a communication document

- Repost communication documents received with errors

How to Use the Analysis Tool in the R/3 System

To retrieve a list of communication documents using the analysis tool:

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → R/2-R/3 Link → Error Analysis → Evaluate Commun.Doc.* from the SAP menu bar.

2. Choose *Communication → Evaluate commun.doc* or *Error analysis → Evaluate commun.doc* from the menu bar.

3. On the initial screen, a typical selection includes the evaluation of all communication documents transmitted in one day. To receive this evaluation, you choose *Execute*.

   On this screen, it is also possible for you to select communication documents based on time and/or record number intervals.

   The system displays a global overview of communication documents.

   The number of communication documents listed in the Complete column have been correctly processed and posted in the R/3 System.

   If a communication document is listed in the Open column, it has been received in the R/3 System but has not yet been processed.

   If an error has occurred (for example, an attempted goods receipt posting without maintaining the material master in R/3), these communication documents will be listed in the Incorrect column.

4. To retrieve more information about a specific group of communication documents (for example, all communication documents received for goods receipt, goods issue and

The Analysis Tool

posting changes) move the cursor to that number group and *choose Overview comm.doc*. on the applications toolbar or simply double-click the mouse on the number.

The system displays an overview of the communication documents from that group. For communication documents with errors, the corresponding error message is also displayed with the list.

In the overview of communication documents, the document types are identified as follows:

Communication Document Types

Type	Description
IO	goods receipt or goods issue
TP	posting change (transfer posting)
DD	delivery document (only pertains to R/2 Rel. 4.3)
MW	material master WM
DS	SD delivery document (pertains to R/2 Rel. 5.0)
MS	material master from SD (R/2 Rel. 5.0)
ML	material master for storage location (R/2 Rel. 5.0)

An X in the D column indicates that a communication document has been sent previously (double transmission).

5. To display a list of communication records in a specific communication document, move the cursor to the desired document and *choose Display comm.doc*. on the applications toolbar (or double-click the mouse).

6. To display detailed information about a specific communication record, move the cursor to a record in the list and *choose Display comm.record* (or double-click the mouse).

Updating the Global Overview

From the global overview screen (described in step 3 above), you can update the information displayed at any time. To do this, choose *Refresh* from the applications toolbar.

Reposting Communication Documents in R/3

You can find the number of communication documents that could not be processed in R/3 under the heading Incorrect in the global list of communication documents which you retrieve as described in steps 1 to 3 of the topic The Analysis Tool [Page 566]. Once the error which caused the interruption has been corrected, you must manually repost the communication document, so that all necessary updates in the system are carried out.

> A goods receipt is posted in the R/2 System and has been transmitted to the R/3 System, but the material master record for the corresponding material has not been maintained in the R/3 System. In this case, an error occurs because the R/3 receiving program cannot carry out the necessary updates. Once you maintain the material master record in the R/3 System (that is, once you create the Warehouse Management view in the R/3 System), and repost the corresponding communication document, the system will create a transfer requirement and post the corresponding quant to the goods receipt area.

Reposting from the Selective Overview

To repost a communication document from the selective overview using the analysis tool

1. Retrieve the selective overview of the communication documents received with errors (see step 4 in The Analysis Tool [Page 566].)

2. Move the cursor to a communication document number and *choose Repost comm.doc*.

3. To repost the communication document in the background, *choose Post in background.*

   The system reposts the communication document and completes the corresponding transactions in the R/3 System.

   To repost the communication record in the foreground, *choose Post in foreground*

   The detailed communication record you selected is automatically retrieved and displayed on the screen.

4. At this point, you can display the communication records of a document when you repost them and (generally, as an exception) change selected fields if you desire to do so.

   Choose ENTER to initiate the processing of the communication record.

   The system posts the modified record to the data base.

> Due to the possibility of creating inconsistencies between the R/3 and host systems, you should exercise caution in making changes to relevant fields in communication documents when reposting them in the foreground. This should only be done as an exception.

Reposting a Specific Communication Document

If you know the number of a communication document that you want to repost, you can select the reposting task directly without entering the analysis tool function.

To access this task directly:

Reposting Communication Documents in R/3

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → R/2-R/3 Link → Communication → Warehouse Management → Repost Commun. Doc.* from the SAP menu.

2. Enter the number of the desired communication document in the *Record number* field.

From this point, you repost communication records using the same procedures as described in "Reposting from the Selective Overview" above.

Bulk Processing When Reposting Open Communication Documents

Very often, several communication documents are processed incorrectly due to a similar type of error. Some errors (such as block errors) can be eliminated automatically by simply reposting the communication documents again. In this case, having to repost one record at a time is painfully slow and time consuming.

Mail Control in the R/3 System

In the R/3 System, there are two tables that allow you to specify users and types of Mail messages to be sent when errors occur or when specific transactions are carried out in the system:

- Logical Error Recovery Table

- Parameters for Generating Logs and Mail Messages (R/2 $\rightarrow$ R/3)

You can find both of these tables by selecting objects using the *Warehouse Management IMG*.

The use of these tables is described below.

Assigning Users to Receive Mail Messages

In the R/3 System you can specify a particular user to receive error messages for certain communication documents. You can assign one user per record type for this purpose.

To assign users to receive Mail messages, choose *Define decentralized link to R/2* in the *Interfaces* section of the *Warehouse Management IMG*. You can enter the name of a user for each record type. In this table, you can also designate whether the messages are to be sent as "express" messages by selecting the field *User name*. This is illustrated in the table below:

Mail Recipient Control

WhN.	Rec.ty	Recip.name	Express	Mail outg.
111	WM01	MILLER	X	
111	WM02	MILLER	X	
111	WM03	SMITH	X	
111	WM04	SMITH	X	

> For example, as shown in the above table for record types WM01 and WM02 (transactions involving goods movements and posting change notices from R/2 Inventory Management to R/3 Warehouse Management), an express mail is transmitted to user MILLER each time an error occurs. For errors involving record types that download delivery data to the R/3 System, an express mail is sent to user SMITH.

See <u>Record Types [Page 506]</u> for a list of record types used by the R/3 system.

Selecting Log and Mail Message Parameters

To control the transmission of Mail messages and other logging functions, choose *Define decentralized link to R/2* in the *Interfaces* section of the *Warehouse Management IMG and* choose *Activate* for *Log* and *Mail messages* from the list of objects.

In this table you can select options that will cause the system to

- Send a Mail message when a logical or system (CPI-C) error occurs

Mail Control in the R/3 System

- Send a Mail message when a material master is created in the R/2 System

- Log each communication document in the spool file

- Make a log entry in the spool file when an error occurs

- Print records immediately on a printer (specified in the same table)

Processing a Mail Message

When a user receives an express Mail message, a pop-up window appears with a notice that a message has arrived in the Inbox. From the pop-up window, the user can immediately access the message. From the mail message screen, it is then possible, for example, to maintain the Warehouse Management view of the material master record by choosing *Edit → Process* from the Inbox menu bar.

PART 2: R/3 -> R/2 Processes

This section contains topics that describe the transfer of data from the SAP R/3 System to the R/2 Host.

Setting up the R/3 Control Tables

In the R/3 System, various control tables must be set up to use the R/3 Warehouse Management system. Some of these tables have already been described under R/2 → R/3 Processes [Page 511] since they pertain to processes in both systems.

To configure the R/3 System, you must

- Activate the R/2-R/3 link in the R/3 warehouse number record

- Define and activate queues

- Assign number range intervals for communication documents

- Assign activity keys to WM movement types in the R/3 System

- Define storage types and movement types for which cumulative communication documents are to be sent to the R/2 System (see Cumulative Transmission of Differences R/3 → R/2 [Page 545])

- Identify transactions for which Mail messages are to be sent (see Mail Control in the R/3 System [Page 570])

- Assign recipients for Mail messages
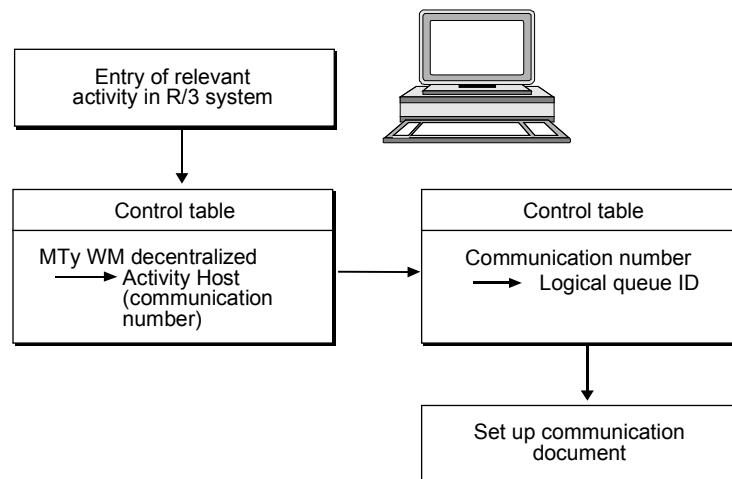
Most of the activities above can be maintained from the "R/2-R/3 Link" screen by choosing *Define decentralized link to R/2* in the *Interfaces* section of the *Warehouse Management IMG*.

> For information on how to set up the control tables, refer to the *WM Implementation Guide*.

How the Control Tables are Used

The figure below illustrates how the control tables are used when creating communication documents in the R/3 System.

Sending Communication Documents from R/3 to R/2

Certain transactions result in a data transfer from the R/3 System to the R/2 System. These include:

- Putaways

- Picks

- Difference confirmation

- Transmission of picked quantities for R/2 deliveries

General Process

For information about general R/3 → R/2 processes, see R/3 → R/2 Processes [Page 533].

Linking Activity Keys to Movement Types

The manner in which activity keys and movement types are assigned to communication numbers in the R/3 System affects how and when transactions that are initiated in the R/3 System are transmitted to the R/2 System.

WM movement types, that initiate communication to the R/2 Inventory Management system, are maintained via the activity key 001 in the R/2 System assignment table (see R/3 → R/2 Processes [Page 533]). To send data about picked quantities back to the R/2 Shipping system, you must make an entry with the corresponding activity key 002.

To maintain this assignment table, choose *Define decentralized link to R/2* in the *Interfaces* section of the *Warehouse Management IMG* and then *Individual Processing* from the list of objects.

Defining Communication Indicators

From the assignment table described above, you can set an indicator that determines whether the communication of data to the R/2 System will take place immediately or depending upon each material.

To set the indicators, position the cursor on the desired line and choose *Detail.*

The system displays the detail screen for movement type links to the activity key. In the "Assignment" section of the screen, the communication number is displayed along with three fields:

- Source items

- Destination items

- Differences

For each of these fields, there are three possibilities for defining communication indicators

"Blank" no communication takes place

"1" A communication record is set up immediately for transmission to R/2.

　　　This indicator is generally used for critical or perishable materials.

"2" material dependent - Another indicator in the material master record (Message to IM) is activated. This second indicator determines whether a communication record is to be set up immediately or whether an accumulated document is to be created by starting a program.

You use indicator "2", for example, for materials that are handled infrequently or materials for which there is generally sufficient stock on hand.

Goods Receipt Posted First in R/3

Goods receipts from production are stored in the R/3 WM system initially without reference to a document posted in R/2. In the assignment table (see above), a corresponding entry (movement type 803) has been created for this purpose. For this example, you want to store 40 pallets from production that are filled with a specified material.

Procedure in R/3

To create the transfer order in the R/3 System

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → Stock Transfer → Create Transfer Order → No Source Object* from the SAP menu.

2. As a minimum, you must enter the warehouse number, movement type 803, material quantity, material number, and plant on the first screen. Choose ENTER.

3. Complete the creation and confirmation of the transfer order.

When you confirm the goods movement, a queue is created in the R/3 System.

How Communication Indicators Affect the Transfer

As described under "Linking Activity Keys to Movement Types" above, the communication indicators affect how and when the transmission of communication documents to the R/2 System take place. The following information applies to the transfer order created for the 40 pallets of material in the example:

*   If you use the communication indicator "**1**" for the Source item field (immediate confirmation and transfer of a communication document to R/2), no quant is built in the goods receipt (GR) area. Instead, one communication document is created for each pallet resulting in 40 communication documents.

*   If you use the communication indicator "**2**" for the Source item field, and you have identified the material as a non-critical material, the process is cumulative and negative quants are created in the GR area. In this case, data for all 40 pallets is contained in one communication document for the negative quant in the GR area.

Queue Handling in the R/3 System

The queue information display in the R/3 System is similar to the management information displayed using transaction TMQM in the R/2 System.

To retrieve the queue information in the R/3 System

1. Choose *Logistics → Logistics Execution → Internal Whse Processes → R/2-R/3 Link → Queue → Edit* from the SAP menu.

2. To retrieve all queues in the system, enter * and choose *Display*.

(You can also indicate the full queue ID name or a generic name. For example, **WM*** indicates all queues that begin with WM.)

    The status indicators on this screen are of significance:

        E = Error

        F = Finished

    These indicate whether the transmission of a queue was successful or in error.

3. For additional information about a particular queue, double-click the mouse on a queue ID line.

    In the Modus field, "B" indicates a batch process and "M" indicates manual processing for the transaction.

4. To start manual transmission of information, return to the screen displayed in step 2 and choose *Execute*.

5. For information about the processing of the queue, choose *Goto → Log* from the menu bar.

Creating a New Queue

From the queue maintenance screen, you can create a new queue or copy an existing queue.

    For further information about this topic, see the SAP Communication: Programmer Handbook, Systems R 4.3/5.0, Form S45.2.

Receiving Communication Documents in R/2

The communication process for transactions initiated in the R/3 System which results in the receipt of communication documents in the R/2 System is described in R/3 → R/2 Processes [Page 533]. The basic set-up and communication document handling is similar to that for transactions which transmit communication documents from R/2 to R/3.

R/2 System Setup

For R/3 → R/2 processes, entries in table 340C in the R/2 System link R/3 plants and warehouse numbers to the company code, plant and storage location in the R/2 System.

Linking R/3 Movement Types to R/2 Transactions and Movement Types

You must enter each R/3 movement type that initializes the transmission of data to the R/2 System in table 341C. In this table, transactions and movement types are assigned that are required for postings in the R/2 Inventory Management system.

Table 341C in R/2
R/3 ® R/2 Movement Type/Transaction Linkage

R/3 WhseNo	R/3 MvtType	RM Trans	RM-MType
111	801	TL06	101
111	803	TL11	501

For example, if table 341C is set up as illustrated in the table above, when a goods receipt without a purchase order (movement type 803) is posted in the R/3 Warehouse Management system, a communication document is created and transmitted which initiates transaction TL11 using movement type 501 in the R/2 Inventory Management system.

Analysis Tool in the R/2 System

When a communication document is received from the R/3 System, various checks take place. If the checks find an error, the status record is marked "in error". If the file is received successfully, the status record is marked as "completed". If the process is interrupted, the communication document is marked with the status "open". This status can be displayed using the analysis tool.

See also:

Using the R/2 Analysis Tool [Page 579]

Using the R/2 Analysis Tool

You use the analysis tool in the R/2 System in basically the same manner as the analysis tool in the R/3 System described earlier in this section.

To display the R/2 analysis tool

1. Use transaction TQ90 (enter **ntq90** in the *ok* line and choose ENTER).

2. Enter a record number or a range of record numbers and/or a date/time interval on the initial screen.

    Choose F13.

    The global display in the R/2 System is the same as the display in the R/3 described under The Analysis Tool [Page 566].

3. To retrieve more information about a specific group of communication documents move the cursor to that number group and choose F2.

    For communication documents with errors, the corresponding error message is also displayed with the list.

4. To display a list of communication records in a specific communication document, move the cursor to the desired document and choose F2.

5. To display detailed information about a specific communication record, move the cursor to a record in the list and choose F2 again.

Reposting Communication Documents in R/2

When errors occur during the transmission of communication documents from the R/3 system to the R/2 host, once you correct the errors you must repost the corresponding communication documents in the R/2 System. You can identify errors (technical or logical) using the same procedures available for the R/3 System (see the flow chart under Receiving Communication Documents in R/3 [Page 564]).

Once errors have been analyzed and corrected, you repost communication documents in the R/2 System using transaction TQ92.

Reposting from the Analysis Tool

This transaction can be started from the analysis tool (transaction TQ90) which is described in the previous section. From the global display in the analysis tool (see Step 2 above)

1. Move the cursor to a group of communication documents from the Incorrect column and choose `F2`.

    The system displays an overview of the communication documents with errors. The corresponding error message is also displayed for each communication document in the list.

2. After you have corrected the error, move the cursor to the appropriate communication number and choose `F13`.

3. To repost the communication document in the foreground, choose `F13`.

    To repost the communication document in the background, choose `F14`.

Reposting Directly

To repost specific communication documents individually, you use transaction TQ92. Once you have entered the number of the corrected communication document in the Communication document field, the procedure is the same as described above beginning with step 3a.

Mail Control in the R/2 System

As in the R/3 System, when a communication document is received with errors in the R/2 System, a normal or express mail message can be sent to the user responsible (see Mail Control in the R/3 System [Page 570].)

Assigning Mail Recipients

To assign users to receive mail messages for specific tasks in the R/2 System, you make entries in table 349M. In this table you enter the R/3 warehouse number, record type, recipient and whether or not an express mail message is to be sent.

There is no table, as in the R/3 System, which determines whether or not a Mail message is to be sent.

You can, however, modify some logging and additional functions in the data section of the receiving program (ML18KTOP). To enter this program you use transaction TM38. The parameters are in a so-called modification part at the end of the include.

Reposting Communication Documents in R/2

If you modify any of these parameters in your system, please be aware that you may have to rework this Include after an official SAP system update.

PART 3: Additional Information

This section contains the following topics:

Reorganization of Communication Records

Tables LDK00, LDK07, LDK09, DVK03 and DVK04 contain documents and records resulting from R/3 transactions in the R/2 System.

Communication documents that accumulate as a result of the interface of the R/3 WM system to the R/2 host can be deleted if they meet the following conditions:

- Communication documents are processed (processing status X).

- Processing date occurs before the selection date.

Reorganization report RLRE0LDK reads all LDK00 records that have been processed that are older than the selection date. Afterwards, it selects the dependent records and deletes them from the data base. After the dependent records have been deleted, the status record itself is deleted.

Polling of R/2 Data

Normally, data created in the R/2 host that is stored in the DOUT file is transferred by the R/2 System to the R/3 System. However, it is also possible for R/2 data to be retrieved by the target (R/3) system. To do this, the R/3 System polls the R/2 data. This capability is of particular significance for the DC system on the host, which does not support a complete APPC interface such as DCAM in BS2000 and IMS.

Polling was imbedded in the existing functions of the R/2 <-> R/3 interface.

In order to start the data transfer from the R/3 System, the R/2 System must take all necessary parameters in the R/3 System into consideration. The R/2 System is displayed as a queue with the queue management function (choose *System* → *Services* → *Queue* from any R/3 menu bar). All parameters of the R/2 System must be defined in the queue. For each queue in the R/2 System, a queue must be defined in the R/3 System which describes the same R/2 System.

From the queue management transaction, polling is then started in the same way as the transfer of data from R/3 to R/2. The triggered entry is marked as active and the number of records transferred is updated in the log. If there is an error, the queue is marked with the status "E" (error) and the error is noted in the log. In addition, a message with an error notice is sent to the corresponding queue.

When polling is started, the R/2 queue must be passed to the R/2 System as a parameter. The R/2 queue must therefore be defined in R/3 with all parameters. This definition is then carried out in an include "RLDLVS90". In order to start the polling process, a driver is needed in the R/3 System. The driver was created as a report "RLDLVS20". This report must also be entered as a driver in the queue that is defined for the R/2 System.

IMS Connection for the WM R/2 - R/3 Interface

In the IMS environment, no complete APPC interface is workable. It is only possible to send a Mail message from the R/2 System. This possibility was used to pass a specific R/3 C-Program (IMSASYNC) from the R/2 System with the queue ID of the activated queue. The IMSASYNC program then passes this information on in a "usage report". The name of the report is taken from the queue ID; the form routine must be called IMSASYNC.

In the new IMSASYNC routine, the queue ID is received and afterwards the polling of the data in this queue is initiated. Polling of the data from a queue means that the transfer of data from R/2 is requested through the R/3 System (see Polling of R/2 Data [Page 584]). For polling, not only the queue ID is needed, but also the parameters of the R/2 System that is to be accessed. The corresponding R/2 System is then determined based on the data from the include RLDLVS90 via the queue ID. In the include RLDLVS90, the definition of the R/2 queue results as well as the assignment of the R/2 queue to the R/2 System, which was then listed as the R/3 queue.

Mobile Data Entry

Purpose

Currently, the work process in the warehouse is characterized by speed, reliability, and precision in processing individual goods movements. To make sure that work is performed efficiently and at a reasonable cost, the warehouse staff requires simple and easy-to-view control of each individual process. The radio frequency (RF) solution provides fast and error-free data communication through the use of mobile RF terminals. This, in turn, provides a high standard of quality.

The RF terminals receive data directly from the SAP System and transmit the results back to the system. You can scan the information that needs to be recorded, such as storage unit numbers, using a bar code (for example, based on UCC/EAN128 standards), and also use the bar code scan to verify the storage bins.

The display of information on the RF terminal is possible with a graphical user interface. You can execute the individual functions using pushbuttons on a touch screen. If you are using a character-based device, SAP provides a special, non-graphic user interface.

Integration

In handling unit-managed storage locations, the RF solution supports the movement of goods through the specification of the respective handling units. If you are working without handling unit-managed storage locations, you can work with handling units as up to now in the delivery and in the shipment. For more information, see Handling Unit Management [Ext.].

Features

RF devices utilize the standard SAPGui (GUI = Graphical User Interface) screen management environment to interact with the users. The screens are designed for normal device functions, such as the use of pushbuttons and reduced screen size.

Currently, two device types are supported:

1. GUI devices (with graphical user interface) that run on Windows 3.x/95

2. Character devices (that is, character-based) under terminal emulation mode

> The same set of screens is used by the GUI and character-based environments.

GUI Devices

These devices are connected to the SAP System just like any other client-dependent PC. The screens can be touch screens, using predefined pushbuttons, or they can operate using a keyboard. If you are using touch screens, you simply "touch" the appropriate positions on the touch screen instead of clicking with the mouse on a pushbutton.

System fonts and size should correspond to the guidelines provided in order to achieve optimal utilization of the screen size.

Mobile Data Entry

Character-Based Devices

These devices are linked to the system through an SAP standard interface called the SAPConsole. The SAPConsole operates on a Windows NT platform and interacts with the RF terminals connected to it. This concept is currently supported by the leading providers of RF terminals.

The actual communication between the SAPConsole and the terminals can be achieved either through the use of a standard Telnet server or through an optimized server that is provided by the RF terminal vendor. These specific I/O engines are integrated into the SAPConsole, which is based on the COM technology.

The following two industry standards for screen sizes are supported:

1. Devices for forklifts: 8 lines by 40 characters each

2. Portable handheld devices: 16 lines by 20 characters each

In addition, with user exits, you can define user-specific display sizes that allow every device type to be supported.

With all device types, navigation takes place through function codes that have to be defined on the keyboard.

Settings for Function Keys

Due to the character mode of the RF devices, pushbuttons must be used for all available functions. You should set up the RF device so that it corresponds to the standard function keys.

The standard layout of the RF screens is designed in such a way that the pushbuttons for the key functions are located in the upper half of the screen, while additional pushbuttons are set in the lower half of the screen.

The settings for the function keys are explained in the relevant sections.

Pushbutton *Enter*:

- As a stand-alone pushbutton, you can use *Enter* to check the verification fields.

- In Customizing for *Mobile Data Entry* you can replace up to five pushbuttons in a sequence with one click on *Enter*. Customize this substitution by choosing *Default Enter Function* (*Navigation with Bar Code Scanner*). First, assign types to the physical screen by selecting *Default Enter Function* (*Navigation with Bar Code Scanner*) → *Categorization of Physical Screens.* In the second table, *Default Enter Function (Navigation with Bar Code Scanner)* → *Pushbutton Sequence,* define which pushbuttons are to be activated by using *Enter*.

  The above mentioned tables contain a Customizing proposal for the *Enter* pushbutton. For more information, see description in the Implementation Guide (IMG) Default Enter Function [Ext.].

Supported pushbutton codes and the corresponding activity:

Function Code	Activity
PGDN	Proceed to next item
SAVE	Save
CMPL	Save and proceed to next screen

BACK   Go back to previous screen (only supported for source screens)

Flexibility of the RF Solution

Different user-specific application options are available in the Customizing application:

- User-defined screen management enables you to customize the size and the number of screens.

- User-defined menu management enables you to assign certain transactions to user roles.

- Definition of fields to be verified, such as storage bin or storage unit

- Support of different bar code types and the use of application identifiers (AI), also for combined bar codes

- User exits to control the sequence during transfer order processing

Integrated RF Solution Versus IDoc Solution

Radio Frequency	WM WCU / MM MOB
Integrated solution	Asynchronous solution
No middleware	Partner software
Immediate system response enables the user to react instantly	Entry control in the SAP System only possible with time delay
Latest functions available after each new release	Static solution
Standard screens can be customized	Dialogs can be customized individually using partner software

Since the RF solution is an integral part of the standard SAP System, you can access the RF transactions either directly through the SAP menu or from mobile data-entry devices (graphical and non-graphical). Generated information is available to the RF user immediately and transmitted back to the SAP database instantly.

User Management

Each RF user must be assigned to the following parameters, which have to be entered in the Customizing for *Mobile Data Entry* by choosing *RF-Queue Management* → *Assign Processor to Queues*. The main screen, screen format, and screen variant can be changed during logon by the relevant user. To change the warehouse number and the queue, choose *Internal Warehouse Processes* → *Queue Change*.

- **Main Menu:** Identifies the group of functions provided for the relevant user.

- **Warehouse Number:** Each user can have only one warehouse number assigned at any one time.

Mobile Data Entry

- **Queue:** Determines the area in the warehouse where the user executes operations and the specific types of operations.

- **Screen Format (Presentation Type):** Each user can select one of the two standard presentation types (8x40 and 16x20) to match the device type used.

- **Screen Variant (User Exit Version):** Several or all screens can be customized with respect to size and the scope of information displayed. It is possible to set one screen that uses the user exit and another screen that uses the standard screens, based on the selected presentation type.

Menu Management

You can change the proposed RF Menu [Ext.] and adjust it according to your own preferences in Customizing for *Mobile Data Entry* by choosing *Define Menu Management*.

The menu paths in the respective chapters are valid only for the delivered RF Menu.

RF-Supported Processes

The RF solution guides the user through each activity that is executed in the warehouse. Limited information is displayed to the users, which they must then verify by scanning bar codes.

The following internal and external warehouse activities are supported by the RF connection:

- Goods receipt

- Goods issue

- Putaway

- Interleaving

- Picking

- Pick and pack

- Inventory

- Posting changes

- Pack/unpack

- Load/unload

- Various inquiry options

For an overview of RF-supported handling unit processes, see also Radio Frequency [Ext.].

Depending upon the required Customizing settings, the following rules apply:

- Queue assignment:

    The user assigned to a queue may only perform the activities allowed for this queue (for example, picking) if the access to transfer orders [Page 663] is limited.

- Two-step confirmation:

Material picking and material transfer are confirmed in two separate steps, and the data is updated in the database after each of these physical steps. This forms the basis of the recovery functionality, that is, resuming the transaction or activity without loss of data.

Goods Receipt and Goods Issue

Use

Besides the internal warehouse processes, the inbound and outbound processes are also supported in the mobile environment. This significantly increases the transparency of physical operations. From the time the goods have arrived into the warehouse, the staff can process them using radio frequency devices until they are loaded and shipped to the customer. Receiving and shipping information, including quantity, palletization, and storage data, can be modified or updated immediately and entered directly into the mobile terminals.

Prerequisites

Goods receipt (GR) and goods issue (GI) are based on an inbound or outbound delivery.

Features

You can identify the inbound and outbound deliveries for goods receipt and goods issue in different ways:

- By Delivery [Page 592]

- By Handling Unit [Page 595]

- By Staging Area [Page 598]

- By Shipment [Page 601]

- By Other Criteria, such as Material, Vendor / Ship-to party, Delivery Date, Reference, Door, or Service Agent [Page 604]

You can identify outbound deliveries also:

- By Group [Page 607]

GR/GI: Selected by Delivery

Use

Identify the inbound delivery or the outbound delivery by the delivery number itself.

Procedure

1. For inbound deliveries: Choose *Inbound Process* → *Goods Receipt* → *GR by Delivery*.

   For outbound deliveries: Choose *Outbound Process* → *Goods Issue* → *GI by Delivery*.

2. Enter the delivery number either using the scanner or the keyboard and choose *F4 Next* to proceed to the next screen.

3. This screen displays the following information:

   – Load status of the delivery: The checkbox is marked if the delivery is fully loaded.

   – Ship-to party account number / Name of the receiving party (for an outbound delivery)

   – Vendor account number/ Name of the vending party (for an inbound delivery)

   – Shipping point and shipping date

   – Total weight of the goods to be delivered

   – Number of packages

   – HU indicator: If marked, a handling unit exists for this delivery.

   – TO indicator: If marked, a transfer order exists for this delivery.

4. Choose *F1 Post* to post the goods in Inventory Management. In general, the transfer order must be confirmed before executing the posting. For an inbound delivery, you can define in Customizing for *Handling Unit Management* that the delivery is posted before transfer order creation and confirmation. Choose *Basics* → *Delivery* → *Define Sequence of Transfer Order – Goods Receipt.*

   > In Customizing for *Logistics Execution,* you can define that the delivery is automatically posted when all the delivery items are processed. Choose *Warehouse Management* → *Interfaces* → *Shipping* → *Define Shipping Control* → *Define Shipping Control at the Movement Type Level.* Enter the value 2 in the *Copy WM quantity* field.

5. With *F4 Item*, you display information on the item(s) that belong(s) to this delivery. For each item, material information will be displayed. On the same screen, you can change the delivered quantity with *F6 Differences* if discrepancies exist. With *F7 Select*, you confirm that you checked the items. This information is only temporary. If you leave the transaction without saving the confirmed items with *F1 Save*, checked item data is lost. The indicator for total items and confirmed items shows how many items exist in this delivery and how many of these items you already checked.

Additional Functions

Shipment Information

With *F5 Ship*, you display information on the shipment to which the delivery is assigned, if it exists. When you start the unload or load process selected by shipment [Page 651], the start date and time are updated automatically. The end date and time are updated when loading/unloading the last handling unit. These fields can also be updated manually if necessary.

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> The date/time fields are filled with the system date/time if the loading/unloading has not yet started.

Confirm Transfer Order for Delivery

- With *F6 TO execution*, the system branches to a screen where you confirm the transfer order for this inbound or outbound delivery. Continue as described in Putaway: Selected by Delivery [Page 618] (starting from number 4) and Picking: Selected by Delivery [Page 627] (starting from number 4) respectively.

Unload Inbound Deliveries or Load Outbound Deliveries

- For inbound deliveries: With *F7 Unload*, you can unload the goods. If you choose this option, the Unload by Delivery [Page 653] screen appears.

- For outbound deliveries: With *F7 Load*, you can load the goods. If you choose this option, the Load by Delivery [Page 653] screen appears.

Generate Transfer Order for Delivery

- With *F8 Generate TO*, you can create a transfer order for this delivery. If a transfer order already exists, the TO indicator field is marked. In this case, transfer order generation is only possible for items for which no transfer order exists (for example, if the transfer order has been cancelled).

  If the delivery contains batch-managed material, the batch number must be entered in the delivery in order to generate a transfer order.

Display Further Options

- *F2 More* switches between the pushbutton views. If you select *F2 More*, you have access to the following options:

Pack Delivery

- With *F9 Pack*, you pack [Page 638] the selected delivery items in handling units. If a handling unit already exists, the *HU Indicator* field is marked.

Unpack Delivery

- With *F11 Unpack*, you unpack [Page 640] delivery items.

Split Delivery

- With *F12 Split*, you split an outbound delivery to load the items on different means of transportation. The system branches to a screen on which you enter the quantity to be split. Select *F1 Save* to confirm it. A new delivery is created for the split items.

If a handling unit is assigned to the delivery, you must split the delivery by handling units. A screen appears on which you must enter the handling unit to be transferred to a new delivery.

GR/GI: Selected by Handling Unit

Use

Identify an inbound delivery or an outbound delivery by the handling unit number.

Procedure

4. For inbound deliveries: Choose *Inbound Process* → *Goods Receipt* → *GR by Handling Unit*.

   For outbound deliveries: Choose *Outbound Process* → *Goods Issue* → *GI by Handling Unit*.

5. Enter the handling unit number either using the scanner or the keyboard and choose *F4 Next* to proceed to the next screen.

6. This screen displays the following information:

   - Load status of the delivery: The checkbox is marked if the delivery is fully loaded.

   - Ship-to party account number / Name of the receiving party (for an outbound delivery)

   - Vendor account number/ Name of the vending party (for an inbound delivery)

   - Shipping point and shipping date

   - Total weight of the goods to be delivered

   - Number of packages

   - HU indicator: If marked, a handling unit exists for this delivery.

   - TO indicator: If marked, a transfer order exists for this delivery.

5. Choose *F1 Post* to post the goods in Inventory Management. In general, the transfer order must be confirmed before executing the posting. For an inbound delivery, you can define in Customizing for *Handling Unit Management* that the delivery is posted before transfer order creation and confirmation. Choose *Basics* → *Delivery* → *Define Sequence of Transfer Order – Goods Receipt.*

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   >
   > In Customizing for *Logistics Execution,* you can define that the delivery is automatically posted when all the delivery items are processed. Choose *Warehouse Management* → *Interfaces* → *Shipping* → *Define Shipping Control* → *Define Shipping Control at the Movement Type Level.* Enter the value *2* in the *Copy WM quantity* field.

5. With *F4 Item*, you display information on the item(s) that belong(s) to this delivery. For each item, material information will be displayed. On the same screen, you can change the delivered quantity with *F6 Differences* if discrepancies exist. With *F7 Select*, you confirm that you checked the items. This information is only temporary. If you leave the transaction without saving the confirmed items with *F1 Save*, checked item data is lost. The indicator for total items and confirmed items shows how many items exist in this delivery and how many of these items you already checked.

Additional Functions

Shipment Information

- With *F5 Ship*, you display information on the shipment to which the delivery is assigned, if it exists. When you start the unload/load process selected by shipment [Page 651], the start date and time are updated automatically. The end date and time are updated when loading/unloading the last handling unit. These fields can also be updated manually if necessary.

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  The date/time fields are filled with the system date/time if the loading/unloading has not yet started.

Confirm Transfer Order for Delivery

- With *F6 TO execution*, the system branches to a screen where you can confirm the transfer order for this inbound or outbound delivery. Continue as described in System-Guided Putaway [Page 616] and System-Guided Picking/Replenishment [Page 629] respectively.

Unload Inbound Deliveries or Load Outbound Deliveries

- For inbound deliveries: With *F7 Unload*, you can unload the goods. If you choose this option, the Unload by Delivery [Page 653] screen appears.

- For outbound deliveries: With *F7 Load*, you can load the goods. If you choose this option, the Load by Delivery [Page 653] screen appears.

Generate Transfer Order for Delivery

- With *F8 Generate TO*, you can create a transfer order for this delivery. If a transfer order already exists, the TO indicator field is marked. In this case, transfer order generation is only possible for items for which no transfer order exists (for example, if the transfer order has been cancelled).

  If the delivery contains batch-managed material, the batch number must be entered in the delivery in order to generate a transfer order.

Display Further Options

- *F2 More* switches between the pushbutton views. If you select *F2 More*, you have access to the following options:

Pack Delivery

- With *F9 Pack*, you pack [Page 638] the selected delivery items in handling units. If a handling unit already exists, the *HU Indicator* field is marked.

Unpack Delivery

- With *F11 Unpack*, you unpack [Page 640] delivery items.

Split Delivery

- With *F12 Split*, you split an outbound delivery to load the items on different means of transportation. If you split a delivery to which a handling unit is assigned, you must split the delivery by handling units. A screen appears on which you enter the

GR/GI: Selected by Handling Unit

handling unit to be transferred to a new delivery. Select *F1 Save* to confirm it. A new delivery is created.

GR/GI: Selected by Staging Area

Use

Identify an inbound or an outbound delivery by the staging area number.

> Because this selection method is time consuming, we recommend using it only if the deliveries cannot be identified by other criteria.

Procedure

7. For inbound deliveries: Choose *Inbound Process → Goods Receipt → GR by Staging Area*.

   For outbound deliveries: Choose *Outbound Process → Goods Issue → GI by Staging Area*.

8. Enter the staging area and choose *F4 Next* to proceed to the next screen.

9. This screen displays the following information:

   - Load status of the delivery: The checkbox is marked if the delivery is fully loaded.

   - Ship-to party account number / Name of the receiving party (for an outbound delivery)

   - Vendor account number/ Name of the vending party (for an inbound delivery)

   - Shipping point and shipping date

   - Total weight of the goods to be delivered

   - Number of packages

   - HU indicator: If marked, a handling unit exists for this delivery.

   - TO indicator: If marked, a transfer order exists for this delivery.

6. Choose *F1 Post* to post the goods in Inventory Management. In general, the transfer order must be confirmed before executing the posting. For an inbound delivery, you can define in Customizing for *Handling Unit Management* that the delivery is posted before transfer order creation and confirmation. Choose *Basics → Delivery → Define Sequence of Transfer Order – Goods Receipt.*

   > In Customizing for *Logistics Execution,* you can define that the delivery is automatically posted when all the delivery items are processed. Choose *Warehouse Management → Interfaces → Shipping → Define Shipping Control → Define Shipping Control at the Movement Type Level.* Enter the value *2* in the *Copy WM quantity* field.

5. With *F4 Item*, you display information on the item(s) that belong(s) to this delivery. For each item, material information will be displayed. On the same screen, you can change the delivered quantity with *F6 Differences* if discrepancies exist. With *F7 Select*, you confirm that you checked the items. This information is only temporary. If you leave the transaction without saving the confirmed items with *F1 Save*, checked item data is lost. The indicator for

total items and confirmed items shows how many items exist in this delivery and how many of these items you already checked.

Additional Functions

Shipment Information

- With *F5 Ship*, you display information on the shipment to which the delivery is assigned, if it exists. When you start the unloading/ loading process selected by shipment [Page 651], the start date and time are updated automatically. The end date and time are updated when loading/unloading the last handling unit. These fields can also be updated manually if necessary.

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>
> The date/time fields are filled with the system date/time if the loading/unloading has not yet started.

Confirm Transfer Order for Delivery

- With *F6 TO execution*, the system branches to a screen where you can confirm the transfer order for this inbound or outbound delivery. Continue as described in System-Guided Putaway [Page 616] and System-Guided Picking/Replenishment [Page 629] respectively.

Unload Inbound Deliveries or Load Outbound Deliveries

- For inbound deliveries: With *F7 Unload*, you can unload the goods. If you choose this option, the Unload by Delivery [Page 653] screen appears.

- For outbound deliveries: With *F7 Load*, you can load the goods. If you choose this option, the Load by Delivery [Page 653] screen appears.

Generate Transfer Order for Delivery

- With *F8 Generate TO*, you can create a transfer order for this delivery. If a transfer order already exists, the TO indicator field is marked. In this case, transfer order generation is only possible for items for which no transfer order exists (for example, if the transfer order has been cancelled).

  If the delivery contains batch-managed material, the batch number must be entered in the delivery in order to generate a transfer order.

Display Further Options

- *F2 More* switches between the pushbutton views. If you select *F2 More*, you have access to the following options:

Pack Delivery

- With *F9 Pack*, you pack [Page 638] the selected delivery items in handling units. If a handling unit already exists, the *HU Indicator* field is marked.

Unpack Delivery

- With *F11 Unpack*, you unpack [Page 640] delivery items.

Split Delivery

- With *F12 Split*, you split an outbound delivery to load the items on different means of transportation. The system branches to a screen on which you enter the quantity to be split. Select *F1 Save* to confirm it. A new delivery is created for the split items.

  If a handling unit is assigned to the delivery, you must split the delivery by handling units. A screen appears on which you must enter the handling unit to be transferred to a new delivery.

GR/GI: Selected by Shipment

Use

Identify an inbound delivery or an outbound delivery by the shipment number.

Procedure

10. For inbound deliveries: Choose *Inbound Process* → *Goods Receipt* → *GR by Shipment*.

    For outbound deliveries: Choose *Outbound Process* → *Goods Issue* → *GI by Shipment*.

11. Enter the shipment number either using the scanner or the keyboard and choose *F4 Next* to proceed to the next screen.

12. This screen displays the following information:

    - Load status of the delivery: The checkbox is marked if the delivery is fully loaded.

    - Ship-to party account number / Name of the receiving party (for an outbound delivery)

    - Vendor account number/ Name of the vending party (for an inbound delivery)

    - Shipping point and shipping date

    - Total weight of the goods to be delivered

    - Number of packages

    - HU indicator: If marked, a handling unit exists for this delivery.

    - TO indicator: If marked, a transfer order exists for this delivery.

7. Choose *F1 Post* to post the goods in Inventory Management. In general, the transfer order must be confirmed before executing the posting. For an inbound delivery, you can define in Customizing for *Handling Unit Management* that the delivery is posted before transfer order creation and confirmation. Choose *Basics* → *Delivery* → *Define Sequence of Transfer Order – Goods Receipt.*

    > In Customizing for *Logistics Execution,* you can define that the delivery is automatically posted when all the delivery items are processed. Choose *Warehouse Management* → *Interfaces* → *Shipping* → *Define Shipping Control* → *Define Shipping Control at the Movement Type Level.* Enter the value *2* in the *Copy WM quantity* field*.*

5. With *F4 Item*, you display information on the item(s) that belong(s) to this delivery. For each item, material information will be displayed. On the same screen, you can change the delivered quantity with *F6 Differences* if discrepancies exist. With *F7 Select*, you confirm that you checked the items. This information is only temporary. If you leave the transaction without saving the confirmed items with *F1 Save*, checked item data is lost. The indicator for total items and confirmed items shows how many items exist in this delivery and how many of these items you already checked.

Additional Functions

Shipment Information

- With *F5 Ship*, you display information on the shipment. When you start the unload/ load process selected by shipment [Page 651], the start date and time are updated. The end date and time are updated when loading/unloading the last handling unit. These fields can also be updated manually if necessary.

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  The date/time fields are filled with the system date/time if the loading/unloading has not yet started.

Confirm Transfer Order for Delivery

- With *F6 TO execution*, the system branches to a screen where you can confirm the transfer order for this inbound or outbound delivery. Continue as described in System-Guided Putaway [Page 616] and System-Guided Picking/Replenishment [Page 629] respectively.

Unload Inbound Deliveries or Load Outbound Deliveries

- For inbound deliveries: With *F7 Unload*, you can unload the goods. If you choose this option, the Unload by Delivery [Page 653] screen appears.

- For outbound deliveries: With *F7 Load*, you can load the goods. If you choose this option, the Load by Delivery [Page 653] screen appears.

Generate Transfer Order for Delivery

- With *F8 Generate TO*, you can create a transfer order for this delivery. If a transfer order already exists, the TO indicator field is marked. In this case, transfer order generation is only possible for items for which no transfer order exists (for example, if the transfer order has been cancelled).

  If the delivery contains batch-managed material, the batch number must be entered in the delivery in order to generate a transfer order.

Display Further Options

- *F2 More* switches between the pushbutton views. If you press *F2 More*, you have access to the following options:

  ### Pack Delivery

  - With *F9 Pack*, you pack [Page 638] the selected delivery items in handling units. If a handling unit already exists, the *HU Indicator* field is marked.

  ### Unpack Delivery

  - With *F11 Unpack*, you unpack [Page 640] delivery items.

  ### Split Delivery

  - With *F12 Split*, you split an outbound delivery to load the items on different means of transportation. The system branches to a screen on which you enter the quantity to be split. Select *F1 Save* to confirm it. A new delivery is created for the split items.

GR/GI: Selected by Shipment

If a handling unit is assigned to the delivery, you must split the delivery by handling units. A screen appears on which you must enter the handling unit to be transferred to a new delivery.

GR/GI: Selected by Other Criteria

Use

You can identify:

- Inbound deliveries for goods receipt by the following criteria: Material, vendor, delivery date, reference document number, or service agent

- Outbound deliveries for goods issue by the following criteria: Material, ship-to party, delivery date, reference document number, door, or service agent.

> If you select the delivery by material only, the delivery items that contain the specified material are displayed.

Procedure

13. For inbound deliveries: Choose *Inbound Process → Goods Receipt → GR by Others*.

    For outbound deliveries: Choose *Outbound Process → Goods Issue → GI by Others*.

14. Enter one of the selection criteria mentioned above and choose *F4 Next* to proceed to the next screen.

15. This screen displays the following information:

    - Load status of the delivery: The checkbox is marked if the delivery is fully loaded.

    - Ship-to party account number/ Name of the receiving party (for an outbound delivery)

    - Vendor account number/ Name of the vending party (for an inbound delivery)

    - Shipping point and shipping date

    - Total weight of the goods to be delivered

    - Number of packages

    - HU indicator: If marked, a handling unit exists for this delivery.

    - TO indicator: If marked, a transfer order exists for this delivery.

8. Choose *F1 Post* to post the goods in Inventory Management. In general, the transfer order must be confirmed before executing the posting. For an inbound delivery, you can define in Customizing for *Handling Unit Management* that the delivery is posted before transfer order creation and confirmation. Choose *Basics → Delivery → Define Sequence of Transfer Order – Goods Receipt.*

> In Customizing for *Logistics Execution,* you can define that the delivery is automatically posted when all the delivery items are processed. Choose *Warehouse Management → Interfaces → Shipping → Define Shipping Control → Define Shipping Control at the Movement Type Level.* Enter the value *2* in the *Copy WM quantity* field.

GR/GI: Selected by Other Criteria

5. With *F4 Item*, you display information on the item(s) that belong(s) to this delivery. For each item, material information will be displayed. On the same screen, you can change the delivered quantity with *F6 Differences* if discrepancies exist. With *F7 Select*, you confirm that you checked the items. This information is only temporary. If you leave the transaction without saving the confirmed items with *F1 Save*, checked item data is lost. The indicator for total items and confirmed items shows how many items exist in this delivery and how many of these items you already checked.

Additional Functions

Shipment Information

- With *F5 Ship*, you can display information on the shipment to which the delivery is assigned, if it exists. When you start the unload/ load process selected by shipment [Page 651], the start date and time are updated automatically. The end date and time are updated when loading/unloading the last handling unit. These fields can also be updated manually if necessary.

  ⚠️

   The date/time fields are filled with the default date/time if the loading/unloading has not yet started.

Confirm Transfer Order for Delivery

- With *F6 TO execution*, the system branches to a screen where you can confirm the transfer order for this inbound or outbound delivery. Continue as described in System-Guided Putaway [Page 616] and System-Guided Picking/Replenishment [Page 629] respectively.

Unload Inbound Deliveries or Load Outbound Deliveries

- For inbound deliveries: With *F7 Unload*, you can unload the goods. If you choose this option, the Unload by Delivery [Page 653] screen appears.

- For outbound deliveries: With *F7 Load*, you can load the goods. If you choose this option, the Load by Delivery [Page 653] screen appears.

Generate Transfer Order for Delivery

- With *F8 Generate TO*, you can create a transfer order for this delivery. If a transfer order already exists, the TO indicator field is marked. In this case, transfer order generation is only possible for items for which no transfer order exists (for example, if the transfer order has been cancelled).

  If the delivery contains batch-managed material, the batch number must be entered in the delivery in order to generate a transfer order.

Display Further Options

- *F2 More* switches between the pushbutton views. If you select *F2 More*, you have access to the following options:

   ### Pack Delivery

   - With *F9 Pack*, you pack [Page 638] the selected delivery items in handling units. If a handling unit already exists, the *HU Indicator* field is marked.

   ### Unpack Delivery

- With *F11 Unpack*, you unpack [Page 640] delivery items.

Split Delivery

- With *F12 Split*, you split an outbound delivery to load the items on different means of transportation. A screen appears on which you enter the quantity to be split. Select *F1 Save* to confirm it. A new delivery is created for the split items.

> If a handling unit is assigned to the delivery, you must split the delivery by handling units. You proceed to a screen on which you must enter the handling unit to be transferred to a new delivery.

GI: Selected by Group

Use

You can identify a group of outbound deliveries to be processed at roughly the same time by the group number.

Procedure

1. Choose *Outbound Process → Goods Issue → GI by Group*.

2. Enter the group number either using the scanner or the keyboard.

3. This screen displays the following information:

   - Load status of the delivery: The check box is marked if the delivery is fully loaded.

   - Ship-to party account number / Name of the receiving party (for an outbound delivery)

   - Vendor account number/ Name of the vending party (for an inbound delivery)

   - Shipping point and shipping date

   - Total weight of the goods to be delivered

   - Number of packages

   - HU indicator: If marked, a handling unit exists for this delivery.

   - TO indicator: If marked, a transfer order exists for this delivery.

9. Choose *F1 Post* to post the goods in Inventory Management. The transfer order must be confirmed before executing the posting.

   > 💡
   >
   > In Customizing for *Logistics Execution,* you can define that the delivery is automatically posted when all the delivery items are processed. Choose *Warehouse Management → Interfaces → Shipping → Define Shipping Control → Define Shipping Control at the Movement Type Level.* Enter the value *2* in the *Copy WM quantity* field.

5. With *F4 Item*, you display information on the item(s) that belong(s) to this delivery. For each item, material information will be displayed. On the same screen, you can change the delivered quantity with *F6 Differences* if discrepancies exist. With *F7 Select*, you confirm that you checked the items. This information is only temporary. If you leave the transaction without saving the confirmed items with *F1 Save*, checked item data is lost. The indicator for total items and confirmed items shows how many items exist in this delivery and how many of these items you already checked.

Additional Functions

Shipment Information

- With *F5 Ship*, you display information on the shipment assigned to the delivery, if it exists. When you start the unload or load process selected by shipment [Page 651], the start date

and time are updated automatically. The end date and time are updated when loading/unloading the last handling unit. These fields can also be updated manually.

⚠️

The date/time fields are filled with the default date/time if the loading/unloading has not yet started.

Confirm Transfer Order for Delivery

- With *F6 TO execution*, the system branches to a screen where you can confirm the transfer order for this inbound or outbound delivery. Continue as described in System-Guided Putaway [Page 616] and System-Guided Picking/Replenishment [Page 629] respectively.

Unload an Inbound Delivery or Load an Outbound Delivery

- For an inbound delivery: With *F7 Unload*, you can unload the goods. If you choose this option, the Unload by Delivery [Page 653] screen appears.

- For an outbound delivery: With *F7 Load*, you can load the goods. If you choose this option, the Load by Delivery [Page 653] screen appears.

Generate Transfer Order for Delivery

- With *F8 Generate TO*, you can create a transfer order for this delivery. If a transfer order already exists, the TO indicator field is marked. In this case, transfer order generation is only possible for items for which no transfer order exists. For example, if the transfer order has been cancelled.

  If the delivery contains batch managed material, the batch number must be entered in the delivery in order to generate a transfer order.

Display Further Options

- *F2 More* switches between the pushbutton views. If you select *F2 More*, you have access to the following options:

  ### Pack Delivery

  - With *F9 Pack*, you pack [Page 638] the selected delivery items in handling units. If a handling unit already exists, the HU Indicator field is marked.

  ### Unpack Delivery

  - With *F11 Unpack*, you unpack [Page 640] delivery items.

  ### Split Delivery

  - With *F12 Split*, you can split the outbound delivery to load the items on different means of transportation. A screen appears on which you enter the quantity to be split. Select *F1 Save* to confirm it. A new delivery is created for the split items.

    💡

    If a handling unit is assigned to the delivery, you must split the delivery by handling units. You proceed to a screen on which you must enter the handling unit to be transferred to a new delivery.

Putaway

Use

The putaway execution in the mobile environment is based on a transfer order for putaway created in the Warehouse Management system or through a radio frequency function. Via radio frequency, you carry out the transfer order execution to confirm that the goods have been placed in the right place and that the materials are now available at the bin location. The system offers different ways of identifying the transfer order so that you can choose the most appropriate method.

Features

The following options exist for the identification of putaway transfer orders:

- Selected by Storage Unit [Page 610]: We recommend using this option for mixed pallets.

- Clustered [Page 612]

- Selected by Transfer Order [Page 614]

- System-Guided [Page 616]

- Selected by Delivery [Page 618]

Putaway: Selected by Storage Unit

Use

You can use this radio frequency option if you do not know the transfer order for a storage unit (SU). Identify the SUs and then store them in an SU-managed storage type in the warehouse. Mixed pallets should always be identified by the SU number.

> We recommend the following customization if you perform putaway for mixed pallets:
>
> Set an indicator that triggers the destination storage bin to be displayed immediately after scanning the storage unit number. In Customizing for *Mobile Data Entry*, you determine that the source information screen should not be displayed by choosing *Verification Control → Assign Verification Profile to Goods Movement*.

Procedure

1. Choose *Inbound Process* or *Stock Transfer → Putaway → Putaway by Storage Unit.*

2. Enter the SU number either via scanner or keyboard.

3. Use *F4 Next* to verify your entry and to proceed to the source information screen.

For a Transfer Order with One Item

4. Verify the data and select *F1 Save* to save the source information to the database and then *F4 Next* to proceed to the destination information screen.

5. Verify the data. With *F1 Save*, save the destination information to the database.

6. The system returns to the initial screen where you can enter a new SU number.

For a Transfer Order with More than One Item

4. Use *Page up* (∧) or *Page down* (∨) to call up the previous or the next item. In this case, the data is not confirmed.

5. To save the information, verify the data and select *F1 Save:*

   - On the source information screen – if it is displayed - after each item

   - On the destination information screen only once for all the items after having verified the last item

6. The system returns to the initial screen on which you can enter a new SU number.

> You can either confirm all the items of the TO or only parts of the TO.

Putaway: Selected by Storage Unit

Additional Functions

Return to the Previous Screen

- With *F3 Back*, you return to the previous screen.

> In case of a two-step confirmation TO: If you have already saved the source information, and you select *F3 Back*, you will be asked if you really want to leave the screen. If you confirm, the system returns to the logon screen. When you select *F1 Save* the next time on the logon screen, the system automatically displays the destination information screen of the same TO due to the recovery function [Page 664].

Display Details

- Use *F5 Details* to call up further information on the specific transfer order item.

Report Differences

- With *F6 Differences*, you can report differences in the quantity. On the differences screen you can enter the actual quantity and the difference quantity. The system checks whether the sum is equal to the target quantity.

Change Bin

- Use *F7 New Bin* to change the destination bin for a single-step confirmation TO during confirmation.

Substitution of Function Keys

- You can customize the *Enter* key so that it takes the place of a sequence of function keys. For further information about the delivered customization, refer to the *Settings for Function Keys* paragraph in the Mobile Data Entry [Page 586] section.

Putaway: Clustered

Use

You can put away several storage units simultaneously, and thus save time, if you group various transfer order (TO) items together that are identified by storage unit (SU) numbers.

Prerequisites

The requirements for a clustered putaway are as follows:

- The devices you are using must be able to load more than one pallet.

- The destination storage bin should be identical in all SUs.

Procedure

1. Choose *Inbound Process* or *Stock Transfer* → *Putaway* → *Clustered Putaway*.

2. Enter the SU number either via scanner or keyboard.

3. After the selection of each single SU, you can add further SUs to the list by choosing *F7 Next SU*.

   If you have two-step confirmation TOs, the selected SUs must belong to the same TO. For a single-step confirmation, the SUs can originate from different TOs.

4. When you have finished selecting SUs, choose *F4 Next* to proceed to the source information screen.

5. After you have verified the data, select *F1 Save* to save the source information to the database.

6. Select *Page down* (∨) to proceed to the next SU.

7. After you have saved the source information of the last SU, proceed to the destination information screen with *F4 Next*.

8. Verify the data and select *Page down* (∨) to proceed to the next SU.

9. After you have verified the destination information of the last TO, save the destination information to the database with *F1 Save*.

10. The system returns to the initial screen where you can create a new list.

Additional Functions

Return to the Previous Screen

- Use *F3 Back* to return to the previous screen.

Putaway: Clustered

In case of a two-step confirmation TO: If you have already saved the source information, and you select *F3 Back*, you will be asked if you really want to leave the screen. If you confirm, the system returns to the logon screen. When you select *F1 Save* the next time on the logon screen, the system automatically displays the destination information screen of the same TO due to the recovery function [Page 664].

Display Details

- Use *F5 Details* to call up further information on the specific transfer order item.

Report Differences

- With *F6 Differences*, you can report differences in the quantity. On the differences screen you can enter the actual quantity and the difference quantity. The system checks whether the sum is equal to the target quantity.

Change Bin

- Use *F7 New Bin* to change the destination bin for a single-step confirmation TO during confirmation.

Substitution of Function Keys

- You can customize the *Enter* key so that it takes the place of a sequence of function keys. For further information about the delivered customization, refer to the *Settings for Function Keys* paragraph in the Mobile Data Entry [Page 586] section.

Putaway: Selected by Transfer Order

Use

You can enter the transfer order (TO) numbers individually.

Procedure

4. Choose *Inbound Process* or *Stock Transfer* → *Putaway* → *Putaway by Transfer Order*.

5. Enter the TO number.

6. Use *F4 Next* to verify your entry and to proceed to the source information screen.

For a Transfer Order with One Item

7. Verify the data and select *F1 Save* to save the source information to the database and then *F4 Next* to proceed to the destination information screen.

8. Verify the data. With *F1 Save*, save the destination information to the database.

9. The system returns to the initial screen on which you can enter a new TO number.

For a Transfer Order with More than One Item

4. Use *Page up* (∧) or *Page down* (∨) to call up the previous or the next item. In this case the data is not confirmed.

5. To save the information, verify the data and select *F1 Save:*

    -   On the source information screen after each item

    -   On the destination information screen only once for all the items after having verified the last item

7. The system returns to the initial screen where you can enter a new TO number.

You can confirm either all the items of the TO or only parts of the TO in the source information screen and then choose *F4 Next* to proceed to the destination information screen.

Additional Functions

Return to the Previous Screen

-   Use *F3 Back* to return to the previous screen.

In case of a two-step confirmation TO: If you have already saved the source information and you select *F3 Back*, you will be asked if you really want to leave the screen. If you confirm, the system returns to the logon screen. When you select *F1 Save* the next time on the logon screen, the system automatically displays the

Use

destination information screen of the same TO due to the recovery function [Page 664].

Display Details

- Use *F5 Details* to call up further information on the specific transfer order item.

Report Differences

- With *F6 Differences*, you can report differences in the quantity. On the differences screen, you can enter the actual quantity and the difference quantity. The system checks whether the sum is equal to the target quantity.

Change Bin

- Use *F7 New Bin* to change the destination bin for a single-step confirmation TO during confirmation.

Substitution of Function Keys

- You can customize the *Enter* key so that it takes the place of a sequence of function keys. For further information about the delivered customization, refer to the *Settings for Function Keys* paragraph in the Mobile Data Entry [Page 586] section.

Putaway: System-Guided

Use

This putaway procedure is guided by the system. The user logs on to the system and the system decides which transfer order is to be processed. Use the system-guided putaway function, if you wish the system to guide you according to the sorting [Page 671] and your queue assignment [Page 663].

Procedure

1. Choose *Inbound Process* or *Stock Transfer* → *Putaway* → *System-Guided Putaway*

2. The SAP system displays the screen with the source bin data.
   The system works in the background and decides which screens are displayed and also decides on the sequence for transfer order (TO) processing.

For a Transfer Order with One Item

10. Verify the data and select *F1 Save* to save the source information to the database and then *F4 Next* to proceed to the destination information screen.

11. Verify the data. With *F1 Save*, save the destination information to the database.

12. The system proposes the next TO number for processing.

For a Transfer Order with More than One Item

3. Use *Page up* (∧) or *Page down* (∨) to call up the previous or the next item. In this case, the data is not confirmed.

4. To save the information, verify the data and select *F1 Save:*

   • On the source information screen after each item

   • On the destination information screen only once for all the items after having verified the last item

8. The system proposes the next TO number for processing.

   💡

   You can confirm either all the items of the TO or only parts of the TO in the source information screen and then choose *F4 Next* to proceed to the destination information screen.

Additional Functions

Return to the Previous Screen

• With *F3 Back*, you return to the previous screen.

Putaway: System-Guided

In case of a two-step confirmation TO: If you have already saved the source information, and you select *F3 Back*, you will be asked if you really want to leave the screen. If you confirm, the system returns to the logon screen. When you select *F1 Save* the next time, the system automatically displays the destination information screen of the same TO due to the recovery function [Page 664].

Display Details

- Use *F5 Details* to call up further information on the specific transfer order item.

Report Differences

- With *F6 Differences*, you can report differences in the quantity. On the differences screen, you can enter the actual quantity and the difference quantity. The system checks whether the sum is equal to the target quantity.

Change Bin

- Use *F7 New Bin* to change the destination bin for a single-step confirmation TO during confirmation.

Substitution of Function Keys

- You can customize the *Enter* key so that it takes the place of a sequence of function keys. For further information about the delivered customization, refer to the *Settings for Function Keys* paragraph in the Mobile Data Entry [Page 586] section.

Putaway: Selected by Delivery

Use

You can enter the delivery number individually if you have transfer orders (TOs) that refer to a specific delivery and then execute putaway immediately. The system selects and then blocks individual TOs for delivery.

Procedure

7. Choose *Inbound Process* or *Stock Transfer* → *Putaway* → *Putaway by Delivery.*

8. Enter the delivery number either via scanner or keyboard.

9. Choose *F4 Next* to verify your entry. The source information screen appears.

For a Transfer Order with One Item

13. Verify the data and select *F1 Save* to save the source information to the database and then *F4 Next* to proceed to the destination information screen.

14. Verify the data and with *F1 Save*, save the destination information to the database.

15. The system returns to the initial screen on which you can enter a new delivery number.

For a Transfer Order with More than One Item

4. Use *Page up* (∧) or *Page down* (∨) to call up the previous or the next item. In this case the data is not confirmed.

5. To save the information, verify the data and select *F1 Save:*

    -   On the source information screen after each item

    -   On the destination information screen only once for all the items after having verified the last item

9. The system returns to the initial screen where you can enter a new delivery number.

> 💡
>
> You can either confirm all the items of the TO or only parts of the TO in the source information screen and then choose *F4 Next* to proceed to the destination information screen.

Additional Functions

Return to the Previous Screen

-   With *F3 Back*, you return to the previous screen.

> 💡
>
> In case of a two-step confirmation TO: If you have already saved the source information and you select *F3 Back*, you will be asked if you really want to leave the screen. If you confirm, the system returns to the logon screen. When you select *F1*

Putaway: Selected by Delivery

> *Save* the next time on the logon screen, the system automatically displays the destination information screen of the same TO due to the <u>recovery function [Page 664]</u>.

Display Details

- Use *F5 Details* to call up further information on the specific transfer order item.

Report Differences

- With *F6 Differences*, you can report differences in the quantity. On the differences screen, you can enter the actual quantity and the difference quantity. The system checks whether the sum is equal to the target quantity.

Change Bin

- Use *F7 New Bin* to change the destination bin for a single-step confirmation TO during confirmation.

Substitution of Function Keys

- You can customize the *Enter* key so that it takes the place of a sequence of function keys. For further information about the delivered customization, refer to the *Settings for Function Keys* paragraph in the <u>Mobile Data Entry [Page 586]</u> section.

Interleaving

Use

Interleaving alleviates dead-heading in radio frequency-managed warehouses. After putaway, the forklift does not return empty to the goods receipt area to repeat its operation. Instead, the forklift operator receives a new assignment (for example, picking) upon returning. The cyclical nature of work assignments provides a continuous workflow for the forklift operator.

Integration

The interleaving function uses the putaway and picking/replenishment function.

Prerequisites

- Transfer orders for picking/replenishment must be available in the warehouse and each of them should contain only one transfer order item. You can customize this by defining a transfer order split.

- The transfer orders for putaway and picking/replenishment belong to the same queue.

Features

The user exit function [Page 671] allows you to define selection criteria for identifying the next transfer order to be processed for picking/replenishment. For example, you can determine to select a transfer order for picking with a source storage bin that is close to the destination storage bin of the transfer order that was just put away.

Interleaving: Selected by Storage Unit

Use

You can identify the transfer order for putaway by the storage unit number. After you have confirmed the transfer order for putaway, the system proposes a transfer order for picking/replenishment from the queue to which the transfer order for putaway has been assigned. If no transfer order for picking/replenishment is available in this specific queue there is an option to process transfer orders not assigned to this queue by changing the access determination [Page 663].

Prerequisites

Assign yourself to a queue [Page 663].

Procedure

1. Choose *Inbound Process* or *Stock Transfer* → *Interleaving* → *Interleaving by Storage Unit*.

2. Execute the scenario for Putaway by Storage Unit [Page 610].

3. After you have confirmed the destination information of the transfer order for putaway, the system proposes a transfer order for picking.

4. Execute the scenario for Picking/Replenishment System-Guided [Page 629].

5. The system returns to the initial screen where you can enter a new storage unit number to process the next transfer order for putaway.

Interleaving: System-Guided

You can let the system propose transfer orders for putaway. After you have confirmed the transfer order for putaway, the system proposes a transfer order for picking/ replenishment from the queue to which the transfer order for putaway has been assigned.

Prerequisites

Assign yourself to a queue [Page 663].

Procedure

6. Choose *Inbound Process* or *Stock Transfer* → *Interleaving* → *System-Guided Interleaving*.

7. Execute the scenario for Putaway: System-Guided [Page 616].

8. After you have confirmed the destination information of the transfer order for putaway, the system proposes a transfer order for picking.

9. Execute the scenario for Picking/Replenishment: System-Guided [Page 629].

10. The system proposes the next transfer order for putaway.

Picking/Replenishment

Use

The picking execution in the mobile environment is based on transfer orders for picking, which are created in the Warehouse Management system or through a radio frequency function. Via radio frequency, you carry out transfer order execution to confirm the removal of the goods from the bin.

⚠️

Return transfer orders can only be confirmed in background mode.

Prerequisites

For the automatic creation of pick handling units (HU):

If you are working with handling unit-managed storage locations, you can define that pick-handling units are to be created and assigned automatically when you create transfer orders. In Customizing for *Handling Unit Management* choose *Basics → Warehouse Management → Define Control for Automatic Creation of Pick HUs*. In the *Packaging Materials* field you can define a default packaging material for a specific warehouse. It is assigned automatically when you create the pick HU.

If the entire material quantity is picked, propose a source handling unit as a destination handling unit. In Customizing for *Handling Unit Management,* choose *Basics → Warehouse Management → Define Storage* Type and *Define Movement Type*. Enter the value *1* in the *HU Picking Control* field. If you choose this Customizing option, the system does not support the reporting of differences.

Picking from an SU–managed bulk storage type:

A transfer order created for an SU-managed bulk storage type has no reference to specific storage unit numbers, because the system cannot identify which storage units are picked until they are physically removed from a storage bin. When you confirm the transfer order, you have to enter or scan the storage unit number(s) that were actually picked.

To confirm a transfer order for picking from an SU-managed bulk storage type through a radio frequency transaction, it is required that a transfer order item is created for each pallet. In Customizing for *Logistics Execution*, choose *Warehouse Management → Storage Units → Strategies → Define Bulk Storage Area → Define Storage Type Control*. Enter the value *Y* in the *Round off* field.

Features

The following options exist for the identification of pick transfer orders:

- [Pick and Pack by Delivery [Page 635]](#)

Picking: Selected by Transfer Order

Use

You can enter the transfer order (TO) numbers individually.

Procedure

10. Choose *Outbound Process* or *Stock Transfer* → *Picking/Replenishment* → *Picking by Transfer Order.*

11. Enter the TO number.

12. Use *F4 Next* to verify your entry and to proceed to the source information screen.

For a Transfer Order with One Item

16. Verify the data and select *F1 Save* to save the source information to the database. Then select *F4 Next* to proceed to the destination information screen.

17. Verify the data. With *F1 Save*, save the destination information to the database.

18. The system returns to the initial screen where you can enter a new TO number.

For a Transfer Order with More than One Item

4. Use *Page up* (∧) or *Page down* (∨) to call up the previous or the next item. In this case the data is not confirmed.

5. To save the information, verify the data and select *F1 Save:*

   - On the source information screen after each item

   - On the destination information screen only once for all the items after having verified the last item

10. The system returns to the initial screen where you can enter a new TO number.

   You can either confirm all TO items or only parts of the TO on the source information screen. Then choose *F4 Next* to proceed to the destination information screen.

Additional Functions

Return to the Previous Screen

- Use *F3 Back* to return to the previous screen.

   In case of a two-step confirmation TO: If you have already saved the source information and you select *F3 Back*, you will be asked if you really want to leave the screen. If you confirm, the system returns to the logon screen. When you select *F1 Save* the next time on the logon screen, the system automatically displays the

destination information screen of the same TO due to the recovery function [Page 664].

Display Details

- Use *F5 Details* to call up further information on the specific transfer order item.

Report Differences

- With *F6 Differences*, you report differences in the quantity. On the differences screen, you enter the actual quantity and the difference quantity. The system checks whether the sum is equal to the target quantity.

Substitution of Function Keys

- You can customize the *Enter* key so that it takes the place of a sequence of function keys. For further information about the delivered customization refer to the *Settings for Function Keys* paragraph in the Mobile Data Entry [Page 586] section.

Picking: Selected by Delivery

Use

If you have transfer orders (TOs) that refer to a specific delivery, you can enter the delivery numbers individually and then execute picking. The system selects and then blocks individual TOs for execution that are part of this delivery.

Procedure

13. Choose *Outbound Process* or *Stock Transfer* → *Picking/Replenishment* → *Picking by Delivery*.

14. Enter the TO number either using a scanner or the keyboard.

15. Use *F4 Next* to verify your entry and to proceed to the source information screen.

For a Transfer Order with <u>One Item</u>

19. Verify the data and select *F1 Save* to save the source information to the database. Then select *F4 Next* to proceed to the destination information screen.

20. Verify the data. With *F1 Save*, save the destination information to the database.

21. The system returns to the initial screen where you can enter a new delivery number.

For a Transfer Order with <u>More than One Item</u>

4. Use *Page up* (∧) or *Page down* (∨) to call up the previous or the next item. In this case the data is not confirmed.

5. To save the information, verify the data and select *F1 Save:*

   - On the source information screen after each item

   - On the destination information screen only once for all the items after having verified the last item

11. The system returns to the initial screen where you can enter a new delivery number.

You can confirm either all TO items or only parts of the TO on the source information screen. Then choose *F4 Next* to proceed to the destination information screen.

Additional Functions

Return to the Previous Screen

- With *F3 Back*, you return to the previous screen.

    In case of a two-step confirmation TO: If you have already saved the source information and you select *F3 Back*, you will be asked if you really want to leave the screen. If you confirm the system returns to the logon screen. When you select *F1*

Save the next time on the logon screen, the system automatically displays the destination information screen of the same TO due to the recovery function [Page 664].

Display Details

- Use *F5 Details* to call up further information on the specific transfer order item.

Report Differences

- With *F6 Differences*, you report differences in the destination quantity. On the differences screen, you enter the actual quantity and the difference quantity. The system checks whether the sum is equal to the target quantity.

Substitution of Function Keys

- You can customize the *Enter* key so that it takes the place of a sequence of function keys. For further information about the delivered customization, refer to the *Settings for Function Keys* paragraph in the Mobile Data Entry [Page 586] section.

Picking/Replenishment: System-Guided

Use

This procedure is guided by the system. The user logs on to the system, and the system decides which transfer order is to be processed. Use the system-guided function if you want the system to guide you according to the sorting [Page 671] and your queue assignment [Page 663].

Procedure

3. Choose *Outbound Process* or *Stock Transfer → Picking/Replenishment → System-Guided Picking/Replenishment*.

4. The SAP system displays the screen with the source bin data.
    The system works in the background and decides which screens are displayed and also decides the sequence for transfer order (TO) processing.

For a Transfer Order with **One Item**

22. Verify the data and select *F1 Save* to save the source information to the database. Then select *F4 Next* to proceed to the destination information screen.

23. Verify the data and save the destination information to the database with *F1 Save*.

24. The system proposes the next TO number for processing.

For a Transfer Order with **More than One Item**

3. Use *Page up* (∧) or *Page down* (∨) to call up the previous or the next item. In this case the data is not confirmed.

4. To save the information, verify the data and select *F1 Save:*

    *   On the source information screen after each item

    *   On the destination information screen only once for all the items after having verified the last item

12. The system proposes the next TO number for processing.

    💡

    You can confirm either all TO items or only parts of the TO on the source information screen. Then choose *F4 Next* to proceed to the destination information screen.

Additional Functions

Return to the Previous Screen

*   With *F3 Back*, you return to the previous screen.

    💡

    In case of a two-step confirmation TO: If you have already saved the source information and you select *F3 Back*, you will be asked if you really want to leave the

screen. If you confirm, the system returns to the logon screen. When you select *F1 Save* the next time on the logon screen, the system automatically displays the destination information screen of the same TO due to the recovery function [Page 664].

Display Details

- Use *F5 Details* to call up further information on the TO.

Report Differences

- With *F6 Differences*, you report differences in the quantity. On the differences screen, you enter the actual quantity and the difference quantity. The system checks whether the sum is equal to the target quantity.

Substitution of Function Keys

- You can customize the *Enter* key so that it takes the place of a sequence of of function keys. For further information about the delivered customization, refer to the *Settings for Function Keys* paragraph in the Mobile Data Entry [Page 586] section.

Movement: Selected by Storage Unit

Use

You can use this radio frequency option if you do not know the transfer order number of a storage unit (SU). Because there is no movement type check, you can identify transfer orders for putaway or picking. Identify the SUs and then pick them from an SU-managed storage type in the warehouse or put them away.

> If the scanned storage unit number is sufficient for the putaway by transfer order (TO) identification, you can set an indicator that triggers the destination storage bin to be displayed immediately after scanning the storage unit number. In the Customizing for *Mobile Data Entry*, you can determine that the source information screen should not be displayed by choosing *Verification Control → Assign Verification Profile to Goods Movement*.

Procedure

16. Choose *Stock Transfer → Movement by Storage Unit*.

17. Enter the SU number either using a scanner or the keyboard.

18. Use *F4 Next* to verify your entry and to proceed to the source information screen.

For a Transfer Order with One Item

25. Verify the data and select *F1 Save* to save the source information to the database. Then select *F4 Next* to proceed to the destination information screen.

26. Verify the data and with *F1 Save*, save the destination information to the database.

27. The system returns to the initial screen on which you can enter a new SU number.

For a Transfer Order with More than One Item

6. Use *Page up* (∧) or *Page down* (∨) to call up the previous or the next item. In this case the data is not confirmed.

7. To save the information, verify the data and select *F1 Save:*

   - On the source information screen after each item

   - On the destination information screen only once for all the items after having verified the last item

13. The system returns to the initial screen on which you can enter a new SU number.

> You can confirm either all TO items or only parts of the TO on the source information screen. Then choose *F4 Next.* The destination information screen appears.

Additional Functions

Return to the Previous Screen

- With *F3 Back*, you return to the previous screen.

    In case of a two-step confirmation TO: If you have already saved the source information and you select *F3 Back*, you will be asked if you really want to leave the screen. If you confirm, the system returns to the logon screen. When you select *F1 Save* the next time on the logon screen, the system automatically displays the destination information screen of the same TO due to the recovery function [Page 664].

Display Details

- Use *F5 Details* to call up further information on the TO.

Report Differences

- With *F6 Differences*, you report differences in the destination quantity. On the differences screen, you enter the actual quantity and the difference quantity. The system checks whether the sum is equal to the target quantity.

Change Bin

- Use *F7 New Bin* to change the destination bin for a single-step confirmation TO during confirmation.

Substitution of Function Keys

- You can customize the *Enter* key so that it takes the place of a sequence of function keys. For further information about the delivered customization, refer to the *Settings for Function Keys* paragraph in the Mobile Data Entry [Page 586] section.

Pick and Pack

Use

You can use this transaction to pick and pack material in one step. This can be useful, for example, if you need to pick several materials to be packed into one handling unit (HU). You can select an existing handling unit or create a new one. Pick and pack is based on system-guided picking for transfer orders with reference to a delivery.

Prerequisites

- To execute the packing functions using handling units, your system management must maintain all the packaging-relevant parameters in Customizing for *Handling Unit Management*.

  You can define a default packaging material [Page 637] for a warehouse.

- If you want to use the pick and pack function in a storage location that is not handling unit-managed, you must set the *Pick and Pack* indicator. After the transfer order is confirmed, the pick HU is assigned to the delivery. In Customizing for *Logistics Execution* choose *Warehouse Management → Interfaces → Shipping → Define Shipping Control → Shipping Control per Warehouse number.*

- Pick transfer orders are created with reference to deliveries.

Procedure

1. Choose *Outbound Process or Stock Transfer → Picking/Replenishment → Pick and Pack.*

2. You have the following options for defining or selecting handling units:

   a) Enter a new handling unit number from the external handling unit number range.

   b) Enter or scan an existing handling unit number.

   c) If you skip the handling unit number field, the system assigns a number. You can see the number by printing the handling unit label.

   Choose *Enter*. If you defined a default packaging material, it is entered automatically. You can override it and enter a different packaging material.

3. Select *F4 Next* or *Enter* to proceed to the source information screen. The transfer order is selected in a system-guided manner according to the sorting [Page 671].

4. Verify the data and select *F1 Save* to save the source information to the database. Then, select *F4 Next* to proceed to the destination information screen.

5. Verify the data. Choose *F1 Save* to save the destination information to the database.

   If you want to pack transfer order items of a different transfer order into the same handling unit, enter the number of the handling unit that you selected before. Proceed as described above.

If you cannot pack all the transfer order items into one handling unit, create a new handling unit and assign it to the same transfer order.

Additional Function

Print Handling Unit Label

- With *F6 Print*, you can print a label for the handling unit if you have created your own user exit. For more information about printing labels, see <u>Printing Using the User Exit [Page 673]</u>.

Pick and Pack by Delivery

Use

You can use this transaction to pick and pack material in one step. This can be useful, for example, if you need to pick several materials to be packed into one handling unit (HU). You can select an existing handling unit or create a new one. Identify the materials to be picked and packed by the delivery number.

Prerequisites

- To execute all packing functions using handling units, your system management must maintain all packaging-relevant parameters in the Implementation Guide (IMG) for *Handling Unit Management*.

    You can define a default packaging material [Page 637] for a warehouse.

- If you want to use the pick and pack function in a storage location that is not handling unit-managed, you must set the *Pick and Pack* indicator. After the transfer order is confirmed, the pick HU is assigned to the delivery. In Customizing for *Logistics Execution* choose *Warehouse Management* → *Interfaces* → *Shipping* → *Define Shipping Control* → *Shipping Control per Warehouse number.*

- Pick transfer orders are created with reference to deliveries.

Procedure

3. Choose *Outbound Process* or *Stock Transfer* → *Picking/Replenishment* → *Pick and Pack by Delivery.*

4. Enter the delivery number.

5. You have the following options for defining or selecting handling units:

    a) Enter a new handling unit number from the external number range.

    b) Enter or scan an existing handling unit number created through a radio frequency transaction.

    c) If you skip the handling unit number field, the system assigns a number. You can see the number by printing the handling unit label.

    Choose *Enter*. If you defined a default packaging material, it automatically entered. You can override it and enter a different packaging material.

6. Select *F4 Next* or *Enter* to proceed to the source information screen. The transfer order is selected according to the delivery.

7. Verify the data and select *F1 Save* to save the source information to the database. Then select *F4 Next* to proceed to the destination information screen.

8. Verify the data. Choose *F1 Save* to save the destination information to the database.

If you want to pack transfer order items of a different transfer order into the same handling unit, enter the number of the handling unit that you selected before. Proceed as described above.

If you cannot pack all the transfer order items into one handling unit, create a new handling unit and assign it to the same transfer order.

Additional Function

Print Handling Unit Label

- With *F6 Print*, you can print a label for the handling unit if you have created your own user exit. For more information about printing labels, see Printing Using the User Exit [Page 673].

Pack and Unpack

Use

The pack option [Page 638] gives you the option of packing material, handling units, or delivery items.

Non-assigned handling units: It is possible to create handling units without reference to a document. Assign the material items and the packaging material to this handling unit. The packed material is posted to a storage location. The handling units created here are handling units with inventory management information. If the storage location is warehouse-managed, stock information will also be created.

Handling units assigned to a delivery: Packing is part of delivery and shipment processing. During delivery processing, you can select the delivery items that you would like to pack and assign them to handling units. If the incoming goods are stored in a handling unit-managed storage location, it is mandatory to pack them.

In Customizing for *Handling Unit Management* you can create **packaging material** for a warehouse. Choose *Basics* → *Warehouse Management* → *Define Control for Automatic Creation of Pick HUs.*

This material will be displayed automatically upon packing goods. You can also override it with a different packaging material.

The unpack option [Page 640] enables you to unpack handling units that are already packed. This can be necessary if you want to adjust a quantity of the packed material, for example.

Pack

Use

You can use this option to pack material items into an existing handling unit or to create a new handling unit by specifying the material items/ handling units and the packaging material and assigning them to one another.

Procedure

1. Choose *Internal Warehouse Processes → Pack*.

2. You have the following options for defining or selecting handling units:

   a) Enter the number of a new or existing handling unit.

   b) The system assigns a number if you skip the handling unit number field. You can see the number by printing the handling unit label.

   Confirm your entries with *Enter*.

   The handling unit you are packing will be a non-assigned handling unit [Page 637]. A handling unit assigned to a delivery can only be packed via the delivery header screen. In this case, you identify the delivery by using selection criteria (for example, by delivery number [Page 592]).

   Printing labels:

   With *F6 Print*, you can print labels if you have created your own user exit. For more information about printing labels, see Printing Using the User Exit [Page 673].

3. If you have defined a default packaging material [Page 637] for a warehouse, it will automatically be displayed. You can also override it.

4. The plant, storage location, storage type, and storage bin are taken from the handling unit data if you are packing into an existing handling unit. If you create a new handling unit, you must enter them manually. You can also define your own user parameters.

   To define your own user parameters, choose *System → User profile → Own data → Parameters*. The following destination parameters are available:

Parameter	Text
WRK	Plant
LAG	Storage Location
LGT	Storage Type
LGP	Storage Bin

   The warehouse is determined according to the plant and storage location.

   The source storage location is taken from storage location table: In Customizing for *Handling Unit Management*, choose *Basics → Materials Management → Inventory*

Pack

> *Management → HU Requirement for Storage Locations and Default Values for Deliveries.*

Identify the material to be packed by one of the following criteria:

1. Choose **F4 by material** if you want to identify the material itself

   or **F5 by HU** if you want to identify the handling unit to be packed

2. Depending on your choice, enter the following:

   - For the selection by material: Enter the material and quantity to be packed and the unit of measure. You can also enter the stock category number and/or batch.

   - For the selection by HU: Enter the handling unit to be packed.

3. After entering the information, choose *Enter* to add each entry to list.

   - With *F5 HU Detail/Material Detail*, you can call up detailed information on the handling unit/ material.

   - With *F6 Aux. Packaging Material*, you can select auxiliary packaging material. Enter the material and select *Enter*. With *F3 Back*, you return to the previous screen. Your material appears in the list.

4. With *F1 Save*, you save the information to the database.

Unpack

Use

You can use the unpack option to unpack a handling unit (HU) in order to reduce the quantity of the packed material or to unpack a lower-level handling unit.

> Unpacking handling units assigned to outbound deliveries is only supported for non-HU-managed storage locations.

Procedure

1. Choose *Internal Warehouse Processes → Unpack*.

2. Enter the handling unit number. Confirm your entries with *Enter*.

    > The handling unit to be unpacked is a <u>non-assigned handling unit [Page 637]</u>. A handling unit assigned to a delivery can only be unpacked via the delivery header screen.
    >
    > <u>Printing labels:</u>
    >
    > With *F6 Print*, you can print labels if you have created your own user exit. For more information about printing labels, see <u>Printing Using the User Exit [Page 673]</u>.

Identify the material to be unpacked by one of the following criteria:

2. Choose *F4 by material* if you want to identify the material itself

    or *F5 by HU* if you want to identify the material by the handling unit.

2. Depending on your choice, enter the following:

    *   For the selection by material: Enter the material and the quantity to be unpacked and the unit of measure. You can also enter the stock category number and/or batch.

    *   For the selection by HU: Enter the handling unit to be unpacked.

3. After entering the information, choose *Enter* to add each entry to the list.

    *   With *F5 HU Detail/ Material Detail*, you can call up detailed information on the handling unit/ material.

4. With *F1 Save*, you save the information to the database.

Inventory

Use

Inventory counting is a procedure that can benefit greatly from the functions available in Radio Frequency (RF). Inventory counting is so varied and important that it is subject to a number of country-specific tax laws.

You perform inventory counting to achieve a high level of accuracy for the data in the system; this is important both for tax reasons as well as for data maintenance.

Prerequisites

To process the individual inventory counting procedure, you require an activated inventory document in the SAP System.

Features

You can choose between a storage bin count and a storage unit count.

The usual way to carry out inventory is to perform a storage bin count. In this case, you can count the exact quantity.

If you have fully packed storage units in a warehouse and a detailed specification of the quantity is not necessary, you can simplify the inventory by using the option SU count.

The choice "guided" or "not guided" is an alternative from an organizational point of view.

In the guided inventory count, the system proposes all the bins of an inventory document that was assigned to a particular user. This assignment can take place during the creation of the document.

If you execute the non-guided inventory count, you can select and scan storage bins within a warehouse area that is assigned from an organizational viewpoint. "A", for example, processes aisles 1 and 2, and "B" processes aisles 3 and 4, and so on.

For cycle counting, it is advisable to use the system-guided option because the storage bins will not be counted in sequence.

The following is a list of the inventory options available:

- Storage Bin Count [Page 642]

- Storage Bin Count, System-Guided [Page 643]

- SU Count [Page 644]

- SU Count, System-Guided [Page 645]

Executing Storage Bin Count

Use

When you choose the bin count for materials, you scan a specific storage bin.

Procedure

1. Choose *Internal Warehouse Processes → Inventory → Bin Count.*

2. The SAP System automatically finds the default values for the warehouse number (using the user profile) and the storage type (last one entered).

3. Enter the storage bin either via scanner or keyboard and verify your entry.

4. The SAP System automatically fills in the material, storage unit, and unit of measurement, if an active system inventory record exists and the storage bin is not empty.

5. Enter the counted quantity in the appropriate field, or confirm with *F9 Zero Stock*, if an inventory balance is missing.

6. With *F1 Save*, you save the count results of the storage bin, item by item, to the database.

Additional Functions

Call Up the Previous or the Next Quant in a Storage Unit

- Using *previous* (v) or *next item* (^), you call up the previous or the next quant in a storage unit. The data is not confirmed here.

Call Up the Next Quant in a Storage Bin

- Use *F4 Next* to call up the next quant in a storage bin.

Display Details

- With *F5 Details*, you move to the detailed display of the quant data.

      With *F8 Skip*, you can skip the quant on the detail screen.

Delete Storage Unit

- Use *F6 Delete Storage Unit* to delete a quant/SU. This quant is marked as not yet counted.

Find a New Quant

- With *F7 New item*, you call up the details screen where you can enter data in order to find a new quant.

Storage Bin Count: System-Guided

Use

In the system-guided bin inventory count, the system proposes the storage bins to be counted.

Procedure

1. Choose *Internal Warehouse Processes → Inventory → Bin Count Guided.*

2. The SAP System automatically finds the default values for the warehouse number (using the user profile) and the storage type (last one entered).

3. Verify the storage bin either using a scanner or the keyboard.

4. The SAP System automatically fills in the material, storage unit, and unit of measurement, if an inventory record exists and the storage bin is not empty.

5. Enter the counted quantity in the appropriate field, or confirm with *F9 Zero Stock*, if an inventory balance is missing.

6. With *F1 Save*, you save the count results of the storage bin, item by item, to the database.

Additional Functions

Call Up the Previous or the Next Quant in a Storage Unit

- Using *previous* (v) or *next item* (^), you call up the previous or the next quant in a storage unit. The data is not confirmed here.

Call Up the Next Quant in a Storage Bin

- Use *F4 Next* to call up the next quant in a storage location.

Display Details

- With *F5 Details*, you move to the detailed display of the quant data.

    With *F8 Skip*, you can skip the quant on the detail screen.

Delete Storage Unit

- Use *F6 Delete Storage Unit* to delete a quant/SU. This quant is marked as not yet counted.

Find a New Quant

- With *F7 New item*, you call up the detail screen where you can enter data in order to find a new quant.

Executing Storage Unit Count

Use

When you choose storage unit count, you scan a specific storage unit.

Procedure

1. Choose *Internal Warehouse Processes* → *Inventory* → *Count Storage Unit.*

2. The SAP System automatically finds the default values for the warehouse number (using the user profile) and the storage type (last one entered).

3. Enter the storage unit either via scanner or keyboard and verify your entry.

4. The system proceeds to the next field, where you can enter an SU either using a scanner or the keyboard.

5. Confirm this SU to add it to the list.

6. With *F9 Empty bin*, the system counts all the currently uncounted SUs of a storage bin to "zero" and displays them in the list. The system marks the SUs from this list as counted. If you confirm this list, you close the inventory for the storage bin. If you want to update the quantity of an SU, select *F5 Details* and enter the actual quantity in the details screen.

7. With *F1 Save*, you save the count results to the database. You can also save only part of the SUs in the storage bin, if you wish.

Additional functions

Call Up the Previous or the Next Quant in a Storage Unit

- Using *previous* (v) or *next item* (^), you call up the previous or the next quant in a storage unit. The data is not confirmed here.

Display Details

- With *F5 Details*, you move to the detailed display of the quant data.

    With *F8 Skip*, you can skip the quant on the detail screen.

Delete Storage Unit

- Use *F6 Delete Storage Uni* to delete a storage unit from the selection list. This storage unit is marked as not yet counted.

Find a New Quant

- With *F7 New item*, you call up the details screen where you can enter data in order to find a new quant.

Storage Unit Count: System-Guided

Use

During the guided count, the system proposes the storage units (SUs) to be counted.

Procedure

1. Choose *Internal Warehouse Processes → Inventory → Count Storage Unit Guided*.

2. The SAP System automatically finds the default values for the warehouse number (using the user profile) and the storage type (last one entered).

3. Verify the storage bin either via scanner or keyboard.

4. The system proceeds to the next field, where you can enter the SU number, either via scanner or keyboard.

5. Confirm this SU to add it to the list.

6. With *F9 Empty bin* the system counts all the currently uncounted SUs of a storage bin to "zero" and displays them in the list. The system marks the SUs from this list as counted. If you confirm this list, you close the inventory for the storage location. If you want to update the quantity of an SU, select *F5 Details* and enter the actual quantity in the details screen.

7. With *F1 Save*, you save the count results to the database. You can also save only part of the SUs in the storage bin, if you wish.

Additional Functions

Call Up the Previous or the Next Quant in a Storage Unit

- Using *previous* (v) or *next item* (^), you call up the previous or the next quant in a storage unit. The data is not confirmed here.

Display Details

- With *F5 Details*, you move to the detailed display of the quant data.

    With *F8 Skip*, you can skip the quant on the detail screen.

Delete Storage Unit

- Use *F6 Delete Storage Unit* to delete a storage unit from the selection list. This storage unit is marked as not yet counted.

Find a New Quant

- With *F7 New item*, you call up the details screen where you can enter data in order to find a new quant.

Posting Changes

Use

The confirmation order of the posting changes is initiated by the system. The user logs onto the system, and the system decides which posting change is to be confirmed.

Procedure

1. Choose *Internal Warehouse Processes* → *Posting Changes.*

2. The SAP System displays the first posting change to be confirmed. The system works in the background and decides on the sequence for the posting change processing.

3. Use *F1 Save* to save the source information to the database.

4. With *F4 Next*, you call up the destination information screen.

5. Use *F1 Save* to save the destination information and to proceed to the next posting change.

> It is not possible to skip a transfer order. You have to confirm them one after the other. After having confirmed all the posting changes available in the system, the following message appears. "The system could not find a transfer order for execution."

6. Use *F5 Detail* to call up further information on the posting change.

7. With *F6 Difference*, you report stock differences.

Inquiries

Use

The inquiries call up information on material stock or handling units. Different views are available for handling units. You can print a shipping label or handling unit label immediately when displaying the detailed information.

Features

The following inquiries are available:

- Stock Overview [Page 648]

- Handling Unit Detail [Page 649]

- Load Inquiry by Shipment [Page 648]

- Load Inquiry by Delivery [Page 659]

- Load Inquiry by Handling Unit [Page 660]

Inquiries: Stock Overview

Use

With this function, you can call up information on material stock sorted by storage bin, goods receipt date, or shelf life expiration date.

Procedure

1. Choose *Inquiries* → *Stock Overview*.

2. Enter the material, plant, and storage type.

3. Choose one of the three sort criteria:

    - *F7 Sort by storage bin*

    - *F8 Sort by goods receipt date*

    - *F9 Sort by shelf life expiration date*

    The dialog screen *Inquiry - Material Stock Overview* appears.

    - To scroll through the screens, choose *Page up* (^) or *Page down* (v).

Inquiries: Handling Unit

Use

This inquiry displays detailed information on the handling unit (HU), which is assigned to a delivery or a shipment. You can select different views: Lower-level handling units, material, and warehouse management. Printing of labels is supported in this inquiry.

Procedure

1. Choose *Inquiries* → *Handling Unit Detail.*

2. Enter the handling unit number.

3. Choose *F4 Next*. The system displays the packaging material for this handling unit.

Additional Functions

Lower-Level Handling Unit

- With *F7 HU View*, you call up information on any existing lower-level handling units.

Material Information

- With *F8 Material View*, you call up information on the material. The name of the material, the quantity, the unit of measure, the material description, the batch, the stock category, and the special stock indicator will be displayed.

Warehouse Management Information

- With *F9 Warehouse Management View*, you can call up information on the storage unit, the warehouse number, the storage type, and the storage bin.

    This information is only available if the storage location is HU-managed.

Print Labels

- With *F6 Print*, you can print a label if you have created your own user exit. For more information about printing labels, see Printing Using the User Exit [Page 673].

Load and Unload

Use

You can use this function for controlling the loading of handling units onto modes of transport such as trucks, trains, and so on. You can also use this function to control the unloading of goods from incoming means of transport.

When loading goods, you can determine the load sequence. This is important, for example, if goods with different destinations are loaded onto one truck. If you want to load the delivery onto more than one means of transport, you can split the delivery.

Features

The following options are available:

- Load by Shipment [Page 651]: Handling units are loaded according to a known shipment number.

- Load by Delivery [Page 653]: Handling units are loaded according to a known delivery number.

- System-Guided [Page 655]

- Unload by Shipment [Page 651]: Handling units are unloaded according to a known shipment number.

- Unload by Delivery [Page 653]: Handling units are unloaded according to a known delivery number.

Load/ Unload: Selected by Shipment

Use

You can load a means of transport with all the handling units assigned to the shipment, if you know the shipment number.

Procedure

1. For the unload process: Choose *Inbound Process → Unload → Unload by Shipment*.

   For the load process: Choose *Outbound Process → Load → Load by Shipment*.

2. Enter the shipment number.

   > You also access this transaction if you choose load/unload on the delivery header screen. In this case, the shipment number is entered automatically.

3. Enter or scan the handling unit assigned to this shipment.

4. Verify your entries by choosing *F4 Next*.

   > You receive information on this shipment, such as the delivery, the staging area, and the dock. Regarding the handling units, information on the number of (un)loaded handling units, the total number of handling units, the weight of each handling unit and the total weight will be provided.

5. With *F1 Save*, the handling unit that you entered is (un)loaded and the system updates the data on the number of handling units already (un)loaded and their weight. The status of the shipment and delivery changes accordingly.

   > Alternatively, you can first enter a handling unit, instead of the shipment number. Afterwards, the system assigns this handling unit to the respective shipment. Then proceed as described above.

Additional Functions

Load: Detailed Information on the Shipment, Delivery or Handling Unit

- With *F5 Detail*, you call up the load inquiry by shipment [Page 658], the load inquiry by delivery [Page 659], or the load inquiry by handling unit [Page 660] depending on the field from which you are retrieving the detailed information.

Print Shipping Label

- With *F6 Print*, you can print a shipping label for the shipment if you have created your own user exit. For more information about printing labels, see Printing Using the User Exit [Page 673].

Unload a Recently Loaded HU or Load a Recently Unloaded HU

- With *F9 Undo,* you can unload a handling unit that you have just loaded and load a handling unit that you have just unloaded. Now the number and weight of the handling unit are reduced.

  ⚠️

    The start and end date/time of the load/unload process do not change if you use this option.

Load/ Unload: Selected by Delivery

Use

You can load a means of transport with all the handling units assigned to this delivery, if you know the delivery number.

Procedure

5. For the unload process: Choose *Inbound Process → Unload → Unload by Delivery.*

   For the load process: Choose *Outbound Process → Load → Load by Delivery.*

6. Enter the delivery number.

   > You also access this transaction if you choose load/unload on the delivery header screen. In this case, the delivery number will be entered automatically.

7. Verify your entries by choosing *F4 Next*.

   You receive information on the staging area and the dock. Regarding the handling units, information on the number of (un)loaded handling units, the total number of handling units, the weight of each handling unit and the total weight will be provided.

4. Enter or scan the handling unit assigned to this delivery.

5. With *F1 Save*, the handling unit that was entered is (un)loaded and the system updates the data on the number of (un)loaded handling units and their weight. The status of the delivery changes accordingly.

   > Alternatively, you can first enter a handling unit instead of the delivery number. Afterwards, the system assigns this handling unit to the respective delivery. Then proceed as described above.

Additional Functions

Load: Detailed Information on the Delivery or Handling Unit

- With *F5 Detail*, you call up the load inquiry by delivery [Page 659] or the load inquiry by handling unit [Page 660] depending on the field from which you are retrieving the detailed information.

Print Shipping Label

- With *F6 Print*, you can print a shipping label for the shipment if you have created your own user exit. For more information about printing labels, see Printing Using the User Exit [Page 673].

Unload a Recently Loaded HU or Load a Recently Unloaded HU

- With *F9 Undo,* you can unload a handling unit that you have just loaded and load a handling unit that you have just unloaded. Now the number and weight of the handling unit are reduced.

  ⚠️

  The start and end date/time of the load/unload process do not change if you use this option.

Load: System-Guided

Use

During system-guided load control, the system proposes the load sequence of the handling units assigned to a shipment.

Since a handling unit can contain other handling units, the user can enter the higher-level handling unit and the respective lower-level handling units are loaded automatically.

Procedure

1. Choose *Outbound Process* → *Load* → *System-Guided Load.*

2. Enter the shipment number either via scanner or keyboard.

3. Verify your entries by choosing *F4 Next*.

   - The system now proposes the first delivery assigned to the shipment, and provides information on the staging area and the dock.

   - In the lower section, the system proposes the first handling unit assigned to this delivery.

4. With *F1 Save*, the handling unit that was entered is loaded and the system updates the data on the number of handling units already loaded. The status of the delivery changes accordingly.

   Alternatively, you can first enter a handling unit instead of the shipment number. Afterwards, the system assigns this handling unit to the respective shipment. Then proceed as described above.

Additional Functions

Load: Detailed Information on the Shipment, Delivery or Handling Unit

- With *F5 Detail*, you call up the load inquiry by shipment [Page 658], the load inquiry by delivery [Page 659], or the load inquiry by handling unit [Page 660] depending on the field from which you are retrieving the detailed information.

Print Shipping Label

- With *F6 Print*, you can print a shipping label for the shipment if you have created your own user exit. For more information about printing labels, see Printing Using the User Exit [Page 673].

Unload a Recently Loaded HU

- With *F9 Undo,* you can unload a handling unit that you have just loaded. Now the number and weight of the handling unit are reduced.

The start and end date/time of the load process do not change if you use this option.

Load: Inquiries

Use

Use this function to call up the load status of a shipment, a delivery, or a handling unit.

Features

The following inquiry functions for the current load status are available in the system:

- Inquiry for Shipment [Page 658]
- Inquiry for Delivery [Page 659]
- Inquiry for Handling Unit [Page 660]

Inquiries: Load by Shipment

Use

With this function, you can call up the load status of a particular shipment and the status of the respective deliveries.

Procedure

1. Choose *Inquiries → Load Inquiry by Shipment*

   or *Outbound Process → Load → Load Inquiry by Shipment.*

2. Enter the shipment number.

3. With *F4 Next*, you receive the following information on the shipment you have entered:

   − Load status of the shipment:

     • **A:** No goods loaded

     • **B:** Partially loaded

     • **C:** Completely loaded

     • **-:** No goods to be loaded

   − Load processing stage of the shipment

   − List of the respective deliveries and their status

Inquiries: Load by Delivery

Use

With this function, you can call up the load status of a particular delivery and the respective handling units. You can also determine how many handling units are already loaded.

Procedure

4. Choose *Inquiries → Load Inquiry by Delivery*

   or *Outbound Process → Load → Load Inquiry by Delivery.*

2. Enter the delivery number.

3. With *F4 Next*, you receive the following information on the delivery you have entered:

   – Load status of the delivery:
     - **A:** No goods loaded
     - **B:** Partially loaded
     - **C:** Completely loaded
     - **- :** No goods to be loaded

   – Number of loaded higher-level handling units and number of existing higher-level handling units for this delivery

   – List of respective handling units and their status:
     - **L:** Loaded
     - **-:** Not loaded

       Higher-level handling units are marked with an 'X'.

Inquiries: Load by Handling Unit

Use

With this function, you can call up the load status of a particular handling unit, as well as information on the shipping point, weight, and volume.

Procedure

5. Choose *Inquiries* → *Load Inquiry by Handling Unit*

    or *Outbound Process* → *Load* → *Load Inquiry by Handling Unit*.

2. Enter the handling unit number.

3. With *F4 Next*, you receive more information on the handling unit that you have entered:

    –   Shipping point

    –   Load status of the handling unit

    –   List of respective handling units belonging to the same hierarchy

        Higher-level handling units are marked with an 'X'.

RF Activity Control Using the RF Monitor

Use

Each Radio Frequency (RF) user is assigned to a queue in Customizing for *Mobile Data Entry* under *RF Queue Management*. This assignment can be changed at a central place using the RF monitor, for example, by the warehouse manager, or the user can change this assignment at the RF terminal, provided he or she has the authorization to do so.

The user's view at the RF terminal is limited to the transfer orders (TOs) of his/her current queue. To ensure that TO processing by RF users is run as efficiently as possible, a central coordination point is required. This is possible with the help of the RF monitor.

The monitor is used for assigning the TOs created in the warehouse to queues. This assignment takes place according to the shipment type and the source/destination data of the TO. Also, you can use the monitor to supervise the workload and the work capacity of queues.

Features

The following options are available:

- Display of the number of assigned TOs and users, as well as the ratio of workload to users for each queue:
  The individual transfer orders can be listed, sorted by creation date and time, with further detail information.

- Manual shifting of TOs and users to other queues:
  This function enables you to react to unplanned situations.

- Manually changing processing priorities of TOs:
  Transfer orders can be brought forward in the priority list because the priority has changed, or moved further down the queue.

- Forwarding TOs to another queue:
  If no user is available to process TOs from a specific queue, for example, those TOs does not have to be moved manually from the source queue, but can be passed on to another queue (destination queue). For this situation, move the source queue (queue **from** which TOs should be forwarded) beneath the destination queue (queue **to** which TOs are forwarded). This queue relationship enables users to process TOs from the source queue, even if they are assigned to the destination queue. In a system-guided transaction, the TOs of the source queue are automatically forwarded to the operator, assigned to the destination queue, after he processed all TOs in his queue.

> If you want to forward TOs from the queue *Q-Source* to the queue *Q-Destination*, move *Q-Source* beneath *Q-Destination*. Users assigned to *Q-Destination* can then process TOs assigned to *Q-Source* even though the access to *Q-Source* is limited.

> This setting overrides the setting in the access [Page 663] field of the respective queue.

RF Activity Control Using the RF Monitor

Defining a Queue and Changing the Assignment

Use

A queue supports the coordination of warehouse activities and increases work efficiency. You can define a queue that groups similar activities (for example, putaway activities) and then assign operators to this queue. The operators will process transfer orders assigned to this queue.

Queues can be defined for different activities, doors, and areas in the warehouse. The assignment of a queue can be changed due to a change in the workload.

Prerequisites

In Customizing for *Mobile Data Entry,* you can define a queue and assign processors to it by choosing *RF Queue Management*.

You can also determine whether a transfer order that is assigned to a specific queue can only be processed by users that are assigned to this queue or by each user. Choose *RF Queue Management → Define Queues.*

The *Access* field determines the access to transfer orders that do not belong to the user's queue:

No limitation	Transfer orders assigned to a queue with *no limitation* can be processed by users irrespective of their queue assignment.
Strict limitation or no value	An error message will be displayed, informing the user that he or she is about to process a transfer order from a queue to which he or she is not assigned.
Warning	A warning message will be displayed informing the user that he or she is about to process a transfer order from a queue to which he or she is not assigned.

The settings mentioned above are overridden if the respective queue, for which the settings are made, is a forwarding queue. For more information, see RF Activity Control Using the RF Monitor [Page 661].

Procedure

Change the queue assignment:

1. Choose *Internal Warehouse Processes → Queue Change.*

2. Enter the modified queue and with *F1 Save*, save your entry.

3. According to the limitation criteria mentioned above, you must be assigned to a queue with *strict limitation* if you want to process TOs assigned to it.

Recovery

Use

Using the *Recovery* function, you can resume the last activity whenever the RF connection between the RF device and the SAP System is interrupted, without losing data. Operations saved by the user are updated immediately in the system database. If there is a link failure, the system automatically proposes processing at that point where the user last saved data.

Prerequisites

The recovery function is based upon the two-step confirmation procedure for transfer orders. If there is a link failure after the confirmation of a material pick in the first confirmation step, the system will continue with the transfer step when the user logs on to the system again.

> To set two-step confirmation in Customizing for a warehouse movement, the respective confirmation indicators (source and destination storage type) must be set.

Features

- If there is a link failure after the first step (the pick step), the data saved last is retrieved again by the system: With *Save* in the first step, you select a particular transfer order item. After failure and renewed logon under the same user name, the system automatically displays the destination data screen.

- A different user can continue processing a transfer order that could not be finished due to the link failure if "*Selected by TO*" is selected. A warning message informs the user that the TO is being processed by another user.

- If only certain items were saved during the pick step, you can confirm the second step (the transfer step) for the respective items and continue processing for the other items.

For more information, see the Implementation Guide (IMG) for *Warehouse Management in Logistics Execution.*

User Exit

Use

User exits offer you the option of enhancing the existing functions according to your personal requirements.

Features

The following user exits are available:

- User Exit Screens [Page 666]

- Verification with User Exit [Page 670]

- Sorting Using the User Exit [Page 671]

- Printing Using the User Exit [Page 673]

- Deactivating Function Codes with the User Exit [Page 674]

User Exit Screens

Use

The RF solution supports the two screen formats (8x40/16x20) that are offered by most manufacturers of RF devices. The user exit function enables you to display other fields, according to your particular requirements, and also to implement other screen formats.

Features

Fields

You can add fields that are available through standard transactions to the existing screens. Currently, these fields can only be used for display purposes.

Also, you can eliminate fields, which are part of the RF solution, from the display.

Changing the Screen Format

The RF transactions use logical screen numbers. User exit screens are built upon existing screens, but have a separate ID (physical screen number). This physical screen number is assigned to a logical screen and then implemented for users who are assigned to the same user exit class.

User exit screens are maintained in a separate user screen library.

The templates have been defined as part of the RF screen management environment in order to help the user with the development and logic of the specific screens. These screens are called "dummy" screens.

Changing the Screen Layout on Runtime

To change the screen layout on runtime, use the following screen layout modules:

*   MODULE DISABLE_PB
*   MODULE SPECIAL_FIELD_OUTPUT
*   MODULE SET_CURSOR

Screen Selection in RF

The screens in the radio frequency transactions are divided into two main groups: Source information screens and destination information screens. In each group, the screens are chosen dynamically, according to transfer order properties, such as activity and storage unit management.

For example, if the transfer order does not contain a storage unit number because the material will be put away into a non-storage unit-managed storage type, source information screen number 212 appears. If the material will be put away into a storage unit-managed storage type, screen number 202 appears as the source information screen and 302 as the destination information screen. Special screens exist for the confirmation of transfer orders with bulk storage types, because the actual storage unit number must be scanned.

Screen numbers for the different activities and properties

User Exit Screens

Screen	With or without storage unit management	Screen number for the following activities		
		Putaway	**Picking**	**Picking from Bulk**
Source information screen	No storage unit	212	502	--
	Single storage unit	202	502	402
	Different storage units	204	504	404
Destination information screen	No storage unit	312	312	312
	Single storage unit	302	302	302
	Different storage units	304	304	304

Defining a Screen

Use

You can either create a new screen or copy an existing one.

Procedure

1. To create a new screen, enter the program *SAPLXLRF* or *SAPLXLHU* in the screen painter.

    To find out which program you have to enter, do the following:

    - In the screen painter, enter the program SAPLLMOB and the dummy screen number 1xxx. The *Flow Logic* of the dummy screen contains a call for the customer-subscreen in which the respective program (*SAPLXLRF* or *SAPLXLHU*) is included.

2. To copy a screen, proceed as follows:

    - Enter the program *SAPLLMOB* and a screen number.

    - Choose *Element List* and delete the last field, the "OK_CODE".

    - Choose *Subscreen* in the tab page *Attributes* in *Screen type*.

    - Save your data entries under the relevant development class in the customer's namespace.

Assigning a Screen

1. In Customizing for *Mobile Data Entry* in *Logistics Execution*, create a new table record under *Define Screen Management.*This record assigns the new user screen to a logical screen for this user exit version within a program module.

2. Use the CMOD transaction to create a project for this screen. SAP recommends that you start the project name with one of the letters X, Y, or Z, followed by four digits that represent the screen number used.

3. Insert a descriptive text after you have created the project.

4. Choose *Continue*. A dialog box appears.

5. Choose *Local Object* and save your entries.

6. Choose *Enhancement*. A new screen appears. Enter the enhancement name MWMRFxxx and save your entries. Make sure that you include for xxx the last three digits of the logical screen number.

7. Activate the project using the transaction CMOD.

8. In the screen painter, enter the program *SAPLLMOB* and the dummy screen number 1xxx. From the *Flow Logic* tab of the dummy screen, call up the module DATA_TO_EXIT0xxx, open the customer function, and go to *Include*. Do the same for the module DATA_FROM_EXIT0xxx.

9. Enter the data that is entered into the screen through the function (watch out for the import parameters). You need to execute the same step for the structure of the data that returns from the screen through the function (watch out for the export parameters).

10. Here you can add up to four verification fields by filling in the table O_VERIFICATION_ERRORS (internal table). You can define up to four fields on the screen that you can check any way you wish. If an error occurs during the check, you should update this internal table with the appropriate field name. The function reports a known error message: "Error in field verification" (which the user updated in the internal table).

Use of the User Exit

- In the screen management for Customizing, you should enter a new entry with a physical screen number that is assigned to a logical screen number.

- In the screen format variant, enter a number other than 0. This means that you have defined a separate screen.

- At the same time, the administrator should enter a definition in the separate data table stating that the user is assigned to a screen format variant (user exit).

- During logon, the user should enter his or her own screen format variant.

Verification with User Exit

Use

The radio frequency solution supports four types of verification: Storage bin, storage unit number, material, and quantity. To be able to verify other fields, the system also provides a general verification entry. You can use this verification to meet individual requirements, such as verification of batches.

Procedure

1. Create a new screen.

2. In the screen painter, enter the program *SAPLLMOB* and one of the dummy screen numbers 1xxx.

3. Enter the module DATA_FROM_EXIT0xxx on the *Flow Logic* tab of the dummy screen, open the customer function, and access the Include.

4. Here you can enter up to four verification fields by filling in the table O_VERIFICATION_ERRORS (internal table). You can define up to four fields on the screen that you can program according to your specific requirements.

5. If an error is found in the verification checks, the system requires the user to update this internal table with the field names. The following error message appears: "Error in field verification" (which the user updated in the internal table).

Sorting Using the User Exit

Use

System-guided transfer order processing in the RF solution supports two different sort possibilities for the transfer orders:

1) Sorting without defining a user exit

2) Sorting by different sort criteria with the help of a user exit

Both options can be used in the following transactions, but we strongly recommend that you implement the user exit only in the interleaving transactions. In the other system-guided transactions, the sorting defined in the user exit is not reflected properly in the .

- Putaway system-guided: LM04 (Report: RLMOB005)

- Picking system-guided: LM07 (RLMOB008)

- Pick and Pack system-guided: LM45 (RLMOB045)

- Posting change: LM11 (RLMOB010)

- Interleaving system-guided: LM57 (RLMOB005, RLMOB008)

- Interleaving by storage unit: LM56 (RLMOB001, RLMOB008)

Procedure: Sorting Without a User Exit

In the system-guided RF transactions, if you do not define a user exit, the system selects your transfer orders by priority and then by creation date and time.

Procedure: Sorting by Different Sort Criteria with the Help of a User Exit

Use the user exit function EXIT_SAPLLMOB_061:

1. If you use this function for interleaving, the following parameters will be imported:

   - Last storage bin

   - Queue

   - Activity

   To use the user exit, use the enhancement name MWMRFSSG.

   As an additional selection criterion, you want the system to select a transfer order for picking with a source storage bin close to the destination storage bin of the transfer order for putaway executed before.

> If you do not define your own user exit in this function, the system selects the transfer order for picking only according to the queue assignment and the standard sorting mentioned above.

2. If you use this function for any other system-guided transaction, only the parameter for the activity will be imported.

The function returns the transfer order number.

Printing Using the User Exit

Use

The radio frequency solution supports the printing of different label types, for example, shipping labels and handling unit labels. You can use the print pushbuttons in the respective transaction by creating your own user exit function module, which is called from the LE_MOB_PRINT function module.

Prerequisites

To indicate that you created your own user exit in order to print labels, change the status field in the function LE_MOB_PRINT.

Procedure

1. Choose the function LE_MOB_PRINT.

2. Change the status field as mentioned above. If the user exit is not activated, you receive an error message upon using the print pushbuttons.

3. Two parameters, the ok_code and the parameter of the object to be printed, will be passed to the user exit function. The ok_code defines which pushbutton has been selected and the second parameter contains the object ID.

Deactivating Function Codes with the User Exit

Use

Using this user exit EXIT_SAPLLMOB_222, you can deactivate function codes in the delivery header screen.

Procedure

To deactivate individual function codes, activate the user exit using the enhancement name MWMRFCOD and clear the output parameter O_ENABLED.

Result

The respective button still appears on the delivery header screen, but it is deactivated.

Adding Function Keys to Screens

Use

You can add function keys to the user exit screens of the following screens:

Screen	GUI Status
631	LMOB_GRDLVHD
302, 303, 304, 305, 312, 313	LMOB_GROUP12
100, 102, 104, 105, 106, 107, 108, 601, 650, 651	LMOB_GROUP30
760	LMOB_HU04
800, 801, 802, 805, 806, 807	LOAD_CONTROL01
700, 701, 702	STATUS_SCREEN_HU02

Procedure

On those screens you have the option to use one more function key. In the respective user exit screen, you can display the pushbutton and assign to it the function code USRF in the GUI status, which corresponds to the function key Shift+F1.

Define the functionality of the function key in the user exit function EXIT_SAPLLMOB_077.

Using Bar Codes

Use 1

Scan bar codes [Ext.], which are printed on transfer order documents and other container documents. The information on the label needs to be recorded to identify:

- Storage bin

- Material

- Quantity

- Delivery

- Staging area

- Shipment

- Pick wave

- Handling unit

- Storage Unit

Procedure 1

1. Define which bar code is supported in your warehouse to identify goods. In Customizing for *Mobile Data Entry,* choose *Bar Code → Assign Bar Code Types to Warehouse Numbers*.

2. Maintain the structure of the bar code types in Customizing for *Mobile Data Entry* by choosing *Bar Code →Maintain Bar Code Specification*.

Use 2

Verify the information of the following fields:

- Storage unit

- Material

- Quantity

- Storage bin

- Other fields determined in the user exit [Page 670]

Procedure 2

1. Define a verification profile and the respective fields that are to be verified in Customizing for *Mobile Data Entry* by choosing *Verification Control → Define Profiles*.

2. Determine for which warehouse, storage types and movement type your verification profile is valid. In Customizing for *Mobile Data Entry,* choose *Verification Control → Assign Verification Profiles to Goods Movement.*

3. Define which bar code is to be used to verify the fields. In Customizing for *Mobile Data Entry* choose *Bar Code→Assign Bar Code Types to Warehouse Numbers*.

Using Bar Codes

4. Maintain the structure of the bar code types in Customizing for *Mobile Data Entry* by choosing *Bar Code→Maintain Bar Code Specification*.