User's Guide for Material Issue

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About this document

Objective

The objective of this guide is to describe the methods to issue material from the warehouse to the shop floor.

Intended audience

This document is intended for persons in charge of the setup and maintenance of shop floor control in Manufacturing. Consequently, the intended audience can include key users, implementation consultants, product architects, support specialists, and so on.

Document summary

Chapter number	Content
Chapter 1	An overview of the concepts that are related to the issue of material.
Chapter 2	The methods you can use to control material issue.
Chapter 3	A description of backflushing as method to issue material.
Chapter 4	The role of shop floor warehouses in material issue.
Chapter 5	Some backgrounds on warehousing procedures.

How to read this document

This document was assembled from online Help topics. As a result, references to other sections in the manual are presented as shown in the following example:

For details, refer to *Introduction*. To locate the referred section, please refer to the Table of Contents or use the Index at the end of the document.

Underlined terms indicate a link to a glossary definition. If you view this document online, you can click the underlined term to go to the glossary definition at the end of the document .

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Chapter 1
Overview of Material Issue

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Overview of material issue

If you work on a production order, several methods are available to receive material on the shop floor.

Backflushing

The automatic issue of materials from inventory, or accounting for the hours spent manufacturing an item, based on theoretical usage and the quantity of the item reported as complete. For more information, refer to *Backflushing (p. 3-1)* .

Floor stock

A stock of inexpensive material present on the shop floor that can be used in production without recording each issue of material individually. Floor stock is not backflushed and is not part of the estimated costs. To account for floor stock materials, a surcharge is added to the cost price of an end item. A Kanban triggers the supply of floor-stock items to the shop floor. You can create a warehousing order of type **SFC Production** in which you determine from which warehouse and to what work center the material must be shipped.

Controlled material issue

Material is issued from the warehouse to the shop floor in a user-defined way. You can choose to take tight control over the issue process, or you can choose to control the issue process more loosely. In general, the issue of material goes through the following stages:

- **Allocate material in the warehouse**
  A planned production order results in planned inventory transactions. These transactions are used for planning purposes by the MRP planning engine. As soon as a production order is released, warehouse orders are created,

which means that the material in the warehouse is <u>allocated</u> for the production order.

All materials specified in the bill of material (BOM) are <u>allocated</u> in the warehouses, which is reflected in the Estimated Materials (ticst0101m000) session.

If you use <u>shop floor warehouses</u>, you can determine the moment that the material is allocated in the shop floor warehouse.

For more information, refer to *Using shop floor warehouses (p. 4-1)* .

■ **Specify quantity to be issued**
You must specify the material quantity that you want to issue. Depending on the setting of the **Manual Issuing** check box in the Shop Floor Control Parameters (tisfc0100s000) session, ERP LN automatically specifies the planned quantity, or you can manually specify the material quantity. Note that the material quantity is still blocked in the warehouse.

For more information, refer to *Specify material to be issued (p. 2-1)* .

■ **Release material**
If you release the material in the warehouse, the material becomes unblocked, which is a signal for the warehouse employees to start the warehouse outbound procedure.

For more information, refer to *Release material (p. 2-3)* .

■ **Carry out the warehousing procedure**
A user-defined warehouse outbound procedure is carried out.

For more information, refer to *Process warehouse order lines (p. 2-4)* .

■ **Receive material**
The desired material quantity is received on the shop floor.

To handle material from the warehouse to the shop floor, and from the shop floor to the warehouse, you can use the Material to Issue for Production Orders (ticst0101m100) session.

To handle material in a more detailed way, you must use the Production Warehouse Orders (timfc0101m000) session. Particularly in case of serialized items or lot-controlled items, SSA Global recommends that you use this session. All actions on material are laid out in so-called production warehouse orders, which you can view in the Production Warehouse Orders (timfc0101m000) session.

Production Warehouse Orders (timfc0101m000)

Use this session to control material and end items that are sent from the warehouse to the shop floor, and back. In this session, you can issue, return, or cancel items in a detailed way, which is especially important in case of serialized

items or lot controlled items. Every material or end item transaction that results in a warehouse order is reflected by a production warehouse order in this session.

You can select in the **View** menu which production warehouse orders you want to view:

- The production warehouse orders for the **End Item**.
- The production warehouse orders for the **Material**, which are sorted by material position number.

> **Note**
>
> If you want to control warehouse handling of material and end items in a less detailed way, you can use the following sessions:
>
> - Material to Issue for Production Orders (ticst1501m000)
> - Report Orders Completed (tisfc0120s000)

Detailed control of warehouse handling

In this session, the detailed warehouse handling of material and end items enables you to:

- Make a difference between *canceling* a quantity that is still in the warehouse, and *returning* a redundant quantity from the shop floor to the warehouse.
- Return a specific lot code or serial number to the warehouse. This is useful if multiple lots or serial numbers are in the warehouse for a specific material or production order.
- Specify different planned issue dates or receipt dates for a material or a production order. For example, a **Subsequent Delivery** quantity for a specific material can have a planned date that differs from the planned date of the **To Issue** quantity of the material. The planned inventory transactions reflect the different dates. Consequently, the MRP planning will result in a more accurate material planning.
- Restart automatic processing, if you use automatic processing of warehouse orders (the **Direct Process Outbound** check box is selected), and previous automatic processing was not successful, for example, due to a shortage.
- Select a different warehouse procedure when using return orders.

How to use this session

In the **Material** view, you can issue, cancel, or return material quantities in the session's heading as well as in the lines, for a specific production warehouse order.

To handle quantities in the header

If you want to issue material from the warehouse, carry out the following steps:

1. Type the quantity that you want to issue in the header in the **To Issue** field.

2. In the **Specific** menu, click **Process**. If you typed a quantity in the **To Issue** field that is less than the ordered quantity, a new production warehouse order can be created.

3. To continue the material handling process, select the appropriate production warehouse order, and choose the next action in the procedure in the **Specific** menu, for example, **Initiate Inventory Issue**.

If you want to *return* or *cancel* a material quantity, you must also enter the quantity in respectively the **To Return** field or the **To Cancel** field in the header, and then click **Process** in the **Specific** menu.

To handle quantities in the lines

If you have to deal with serialized or lot-controlled items, you must handle your material in a more detailed way. You can choose, for example, to sent an item with a specific serial number back from the shop floor to the warehouse. Therefore, you must double-click the appropriate warehouse production order, so that the details session is started. In the details session, you can indicate the serial number of the item that you want to return.

Multiple production warehouse orders

In the Production Warehouse Orders (timfc0101m000) session, production warehouse orders are listed for a specific production order. A production warehouse order can relate to:

- A planned inventory transaction in the Order - Planned Inventory Transactions (whinp1501m000) session.

- If the production order is at least released: A warehouse order line in the Inbound Order Lines (whinh2110m000) session and the Outbound Order Lines (whinh2120m000) session.

The following sections provide examples of multiple production warehouse orders, for example in case of subsequent deliveries or unit effective items.

To issue - Subsequent delivery

A material for which both a **To Issue** quantity and a **Subsequent Delivery** quantity exist, has two production warehouse orders: One production warehouse order for the **To Issue** quantity, and one for the **Subsequent Delivery** quantity. These two production warehouse orders initially have the same allocation date, but you can change the allocation date manually in the Production Warehouse Orders (timfc0101m000) session.

Order distribution

An order distribution as defined in the Order Distribution (tisfc0105m000) session can result in multiple production warehouse orders. This is the case if the end item or material is defined as **Lot Controlled** in the Items - General (tcibd0501m000) details session, and the **Lots in Inventory** check box is selected in the Items - Warehousing (whwmd4500m000) details session. One production warehouse order is generated for every involved <u>effectivity unit</u>.

If the end item or material is *not* **Lot Controlled**, the full quantity of the production order or material is recorded for effectivity unit 0 (zero), so in that case only one production warehouse order is present.

If the **Unit Effective Supply** check box is cleared in the Items - General (tcibd0501m000) details session, also only one production warehouse order is present.

Production Warehouse Orders (timfc0101m100)

Use this session to search for production warehouse orders by item, warehouse, serial number, lot, revision, effectivity unit, warehouse, and/or warehouse.

You can, for example, enter a specific lot code, item code, or serial number in the session's header. If you then click **Apply**, the production orders and production warehouse order lines are displayed that concern the lot code, item code, or serial number.

This session can be useful for operators on the shop floor in various situations. For example, if operators encounter a material on the shop floor with a specific serial number for which the destination is unknown, they can enter the serial number in this session to find the production order for which the material is required. If the material is not required anymore for the original order, a shop floor operator can search for another order in which the material can be used, or return the material to the warehouse.

Search for lot number or serial number

If you search for orders related to a specific lot number or serial number, your search will not always produce results. If the item's **Lot Selection** field is **Any**, and the **Multiple Lots** check box is selected, it means that more than one lot number is used in an order. As a result, you cannot search for production warehouse orders related to one of those lot codes in the Production Warehouse Orders Overview (timfc0101m100) session.

The same goes for serialized items: If the **Multiple Serials** check box is selected, more than one serial number is used in an order. As a result, you cannot search for production warehouse orders related to one of those serial numbers in the Production Warehouse Orders Overview (timfc0101m100) session.

Chapter 2
Controlled Material Issue

Material issue parameters

The following fields and parameters influence the way ERP LN issues materials:

- **Floor Stock**
  Determines whether the material is <u>floor stock</u>. The **Floor Stock** check box is located in the Items - Warehousing (whwmd4500m000) session.

- **Backflush Materials**
  Determines that ERP LN issues material through <u>backflushing</u>. You can find this parameter in the Items - Production (tiipd0101m000) session. For more information refer to *Set up backflushing (p. 3-2)* .

- **Manual Issuing**
  Determines whether you need to manually specify the material quantity that must be issued. For more information, refer to *Specify material to be issued (p. 2-1)* .

- **Direct Initiate Inventory Issue**
  Determines whether material is automatically unblocked in the warehouse after the production order is released. For more information, refer to *Release material (p. 2-3)* .

- **Direct Process Warehouse Order line**
  Determines whether the warehouse procedure is carried out automatically when you issue material. For more information, refer to *Process warehouse order lines (p. 2-4)* .

Specify material to be issued

In the Shop Floor Control Parameters (tisfc0100s000) session, you can use the **Manual Issuing** check box to specify whether you want to specify the material quantity that must be issued to the shop floor manually or automatically.

Manual issuing

If you select the **Manual Issuing** check box, you must use the Material to Issue for Production Orders (ticst0101m100) details session or the Production Warehouse Orders (timfc0101m000) session to specify manually the material quantity that you want to issue from the warehouse to the shop floor.

The **Subsequent Delivery** field contains the planned quantity that is allocated. After the production order is released, you must specify the material quantity that you want to issue in the **To Issue** field in the Material to Issue for Production Orders (ticst0101m100) details session or the Production Warehouse Orders (timfc0101m000) session.

The process to perform manual issuing consists of the following steps:

1. Release the production order. ERP LN copies the estimated quantity to the **Subsequent Delivery** field.

2. Enter the quantity to issue in the **To Issue** field in the Material to Issue for Production Orders (ticst0101m100) details session. If you want to issue all materials for the order simultaneously, you must click Transfer Subseq. Delivery to Issue on the **Specific** menu.

If you manually specify the material quantity, you are in full control of the issue process. You explicitly decide about the material quantity that is issued, which can be useful, for example, in case of expensive material.

Automatic issuing

If you clear the **Manual Issuing** check box while you release a production order, ERP LN automatically fills the **To Issue** field with the planned material quantity. You no longer need to specify the material quantity manually in the Material to Issue for Production Orders (ticst0101m100) details session or the Production Warehouse Orders (timfc0101m000) session, which saves time. ERP LN issues the entire estimated quantity as soon as the warehousing order line is unblocked.

However, if you want to issue a different material quantity, or you must deal with partial deliveries, you can manually overrule the material quantity. Enter the desired quantity in the **To Issue** field in the Material to Issue for Production Orders (ticst0101m100) details session.

Inventory shortage

If an item's inventory is insufficient, you cannot issue inventory unless the **Negative Inventory Allowed** check box is selected in the Inventory Handling Parameters (whinh0100m000) session. If a shortage arises, and the **Negative Inventory Allowed** check box is cleared, the issued quantity remains in the **To Issue by Warehousing** field, and a shortage report is printed. After the inventory is replenished, you must manually process the unblocked warehousing order.

> **Note**
>
> ■ You can specify a negative quantity to return unused materials to the warehouse, or to cancel a quantity to be issued from the warehouse in the Material to Issue for Production Orders (ticst0101m100) session or the Production Warehouse Orders (timfc0101m000) session. To return or cancel lot-controlled material or serialized items, for best results, use the Production Warehouse Orders (timfc0101m000) session, in which you can specify lot numbers and serial numbers.
>
> ■ The **Manual Issuing** check box does not apply to backflushing and floor stock.

Release material

Unblock or release material in the warehouse is part of the material issue procedure. If material is released, the warehouse employees are notified to start the warehouse outbound procedure.

You can use the **Direct Initiate Invy Issue** check box to specify wether the material must be released manually or automatically:

■ **Automatically**
If you select the **Direct Initiate Inventory Issue** check box, ERP LN automatically unblocks the warehouse order line for the material during production order release.

■ **Manually**
If you clear the **Direct Initiate Inventory Issue** check box, you must release the material manually. To unblock the material's warehouse order line, you must either use the Initiate Inventory Issue (tisfc0207m000) session, or click **Initiate Inventory Issue** in the Material to Issue for Production Orders (ticst0101m100) session. ERP LN now moves the material quantity from the **To Issue** field to the **To Issue by Warehousing** field.

The activated warehousing order line does the following:

■ Issues the requested quantity.
■ Increases the value in the **Actual Quantity** field by the issued quantity.
■ Subtracts the issued quantity from the **To Issue by Warehousing** field.

Set the Direct Initiate Inventory Issue check box

You can set the **Direct Initiate Inventory Issue** check box on three levels to determine whether the material must be unblocked manually or automatically:

■ In the Items - Production (tiipd0101m000) session, where you can set the default value for a specific item, or in the Items - Production Defaults

(tiipd0102m000) session, where you can set the default value for a specific item group.

- In the Estimated Materials (ticst0101m000) session, where a production planner can determine whether the material must be unblocked manually or automatically.

- In the Material to Issue for Production Orders (ticst0101m100) session, where a person on the shop floor can determine whether the material must be unblocked manually or automatically.

Process warehouse order lines

After a warehouse order line is unblocked, as described in *Release material (p. 2-3)* , the warehouse order line must be processed in Warehouse Management. The **Direct Proc. WH Order Line** check box in the Items - Production (tiipd0101m000) session, the Estimated Materials (ticst0101m000) session, or the Estimated vs. Actual Material Costs (ticst0501m000) session, determines whether you must first carry out the warehouse procedure manually for a specific material, or if ERP LN carries out the warehouse procedure automatically.

- **Direct process warehouse order line**
  If you select the **Direct Process Warehouse Order Line** check box, you do not need to carry out the warehouse procedure manually for the material when you issue material. The material is available directly on the shop floor after the material is released. This method is particularly useful if you must collect a material from the warehouse yourself because you need the material instantly.

  If a shortage exists for a material for which the **Direct Process Warehouse Order Line** check box is selected, you can use the Process Material Shortages (tisfc0221m000) session to process the remaining material quantity if the material is in stock again.

- **Manual warehouse order line**
  If you clear the **Direct Process Warehouse Order Line** check box, you must carry out the warehouse procedure manually for the material in Warehouse Management before the material can be shipped to the shop floor. How the procedure is carried out is defined in Warehouse Management. For more information, refer to *To define warehousing procedures (p. 5-2)* .

Chapter 3
Backflushing

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Backflushing

If you do not want to record every issue of a material or every spent production hour individually, you can apply <u>backflushing</u> instead. This saves time, but some precision is lost. Typically, backflushing is used for low cost material with a regular consumption. Backflushing does not reflect the physical material flow, but is an administrative process. Material is shipped to the shop floor, where it is consumed by an SFC order. However, the material is administratively accounted for on the order later.

If a shortage exists for material that you are backflushing, you can use the Process Material Shortages (tisfc0221m000) session to process the remaining material quantity if the material is in stock again.

For a description of the parameters that you must use to set up backflushing, refer to *Set up backflushing (p. 3-2)* .

To obtain detailed information on how ERP LN backflushes operations and production orders, refer to *Backflushing procedure (p. 3-4)* .

Backflushing example

In a machine factory, chains are manufactured. A chain is made of 40 chain links. A machine produces 10 chains in a minute. You release a production order for 300 chains.

The estimated production cost is:
- Estimated materials: 12000 chain links
- Estimated hours: 0.5 hour

Evidently, the operation to produce the chain cannot start before the chain links have been issued from the warehouse to the shop floor. However, if you apply backflushing, you do not record the physical issue of materials in the system.

When the production order is finished, 295 chains are reported completed, and 10 chains are reported rejected, because they were not put together correctly.

The quantity to backflush is 305 (= 295 + 10) chains.

The actual production cost is recorded as:
- Actual materials: 12200 chain links
- Actual hours: 0.508 hour

Set up backflushing

The parameter settings that control backflushing are explained using an example:

The following items have been defined :
- CLOCK
- PIN

The PIN item is used as a component for the CLOCK item in a task called ASSEMBLE.

Backflushing of materials

Use the following settings in the Items - Production (tiipd0101m000) session to set up the items for backflushing:
- Select the **Backflush if Material** check box for the PIN item.
- Select the **Backflush Materials** check box for the CLOCK item.

When you create a production order, these check boxes determine the default settings of:
- The **Backflush Materials** check box in the Estimated Materials (ticst0101m000) session (for PIN).
- The **Backflush Materials** check box in the Production Orders (tisfc0101s000) session.

You can modify these check boxes for a particular production order. ERP LN backflushes the material only if you select both of these check boxes.

If you clear the **Backflush Materials** check box, ERP LN clears the **Backflush Materials** check boxes for all materials.

Backflushing of hours

Use the following settings to set up the items for backflushing of hours:
- Select the **Backflushing** check box for the ASSEMBLE task in the Task Relationships (tirou0104m000) session.

- Select the **Backflush Hours** check box for the CLOCK item in the Items - Production (tiipd0101m000) session.

When you define an <u>operation</u> for the ASSEMBLE task, the **Backflushing** check box in the Task Relationships (tirou0104m000) session determines the default setting of the **Backflushing** check box in the Routing Operations (tirou1102m000) session.

When you create a production order, ERP LN sets the defaults as follows:

- The **Backflushing** check box in the Routing Operations (tirou1102m000) session determines the default setting of the **Backflush Hours** check box in the Production Planning (tisfc0110m000) session.
- The **Backflush Hours** check box in the Items - Production (tiipd0101m000) session determines the default setting of the **Backflush Hours** check box in the Production Orders (tisfc0101s000) session.

You can modify these check boxes for a particular production order. ERP LN backflushes the hours only if you select both of these check boxes.

If you clear the **Backflush Hours** check box, ERP LN clears the **Backflush Hours** check boxes for all operations.

To make backflushing of hours possible, you must also:

- Enter a value in the **Backflush Employee** field in the Work Centers (tirou0101m000) session.
- Enter a value in the **Hourly Labor Type** field in the Shop Floor Control Parameters (tisfc0100s000) session to determine whether work is charged as normal hours or overtime hours.

Serialized items

Serialized items can only be backflushed if in the Items - Warehousing (whwmd4500m000) details session the **Serials in Inventory** check box is cleared, and the **Register Serial Issue During As Built** field is **Yes**. In all other cases, serialized items cannot be backflushed.

If the serialized item is lot-controlled, the lot from which the items are backflushed is based on the outbound method (**Last In First Out (LIFO)**, **First In First Out (FIFO)**) as is defined in the Items - Warehousing (whwmd4500m000) details session.

Miscellaneous

Set the following parameters in the Shop Floor Control Parameters (tisfc0100s000) session:

- Select a backflushing method to determine the level of user interaction in the backflushing procedure.
- Select the devices for the backflushing materials and hours reports.

Backflushing procedure

ERP LN carries out <u>backflushing</u> according to the following procedure.

Step 1:

Backflushing starts when you report a quantity as completed or rejected in one of the following sessions:

- Report Operations Completed (tisfc0130m000) session
- Report Orders Completed (tisfc0520m000) session

Step 2:

The default quantity to backflush is calculated as follows:

```
Quantity to backflush = (Quantity reported as completed + Quantity reported
as rejected) - Previously backflushed quantity
```

The **Quantity to Backflush** field displays this default quantity, which you can modify.

Step 3:

The next step depends on the value of the **Backflushing Method** field in the Shop Floor Control Parameters (tisfc0100s000) session:

- **Automatic**: backflushing proceeds without user interaction.
- **Interactive**: ERP LN asks you if the backflushing must take place.
- **Manual**: you must use the Backflush Materials and Hours (tisfc0220m000) session to carry out backflushing.

Step 4:

ERP LN processes the issued materials and the accounted hours:

- *Process backflushed materials (p. 3-5)*
- Processing backflushed hours

> **Note**
>
> If you use backflushing you can still record additional quantities to issue and account for additional hours in the following sessions:
>
> - Material to Issue for Production Orders (ticst0101s000) session.
> - Through the Hours and Expenses by Employee Overview (bptmm1100m000) session. ERP LN adds these quantities and hours to the backflushed quantities and hours.

Calculate backflush quantity

If you report the total ordered quantity as completed, the material quantity that is issued through backflushing equals the estimated material quantity.

If you report a part of the ordered quantity as completed, the material quantity to issue is calculated as follows:

```
Backflushed material quantity =
Estimated quantity x (Quantity to backflush / Quantity
planned input)
```

- The quantity-planned input is the ordered quantity, corrected for scrap and yield on the operation.
- The estimated quantity that appears in the Estimated Materials (ticst0101m000) session.

Any scrap on the material that you do not define as a percentage but as a fixed quantity is issued all at once as soon as backflushing is carried out. You can define these scrap quantities in the following sessions:

- Estimated Materials (ticst0101m000)
- Production Planning (tisfc0110m000)

Process backflushed materials

ERP LN backflushes the materials linked to the operations for which quantities are reported as completed. If a production order has no operations, ERP LN backflushes all materials.

For details about the calculation of the quantities to issue through backflushing, see *Calculate backflush quantity (p. 3-5)* .

You can see the result of backflushing materials in the Production Orders (tisfc0101s000) session.

ERP LN subtracts the backflushed material quantity from the **Subsequent Delivery** field and adds the same quantity to the **To Issue** field. The correspondig warehousing order is immediately initiated.

Note

- ERP LN does not decrease the value of the **Subsequent Delivery** field below zero.
- ERP LN also prints the results of backflushing materials in a report.

Collect backflush materials from the warehouse

The backflushing of materials takes place when you report a quantity completed (see *Backflushing procedure (p. 3-4)*). ERP LN calculates and processes the quantities that must be backflushed.

From which inventory the materials are backflushed depends on the value of the the following fields:

- The **Lot Selection** field. In this field in the Estimated Materials (ticst0101m000) session or in the Bill of Material (tibom1110m000) session you must indicate whether all materials must be issued from the same lot, from a specific lot, or from an arbitrary (any) lot. This applies especially for lot-controlled items (defined in the Items - General (tcibd0501m000) session). If the material is not a lot-controlled item, the value is always Any.

- The **Outbound Method** field. The value of the **Outbound Method** field in the Items - Warehousing (whwmd4500m000) session determines from which inventory the materials are backflushed.
  You can select one of the following values:
  - **LIFO**: the inventory with the latest inventory date is backflushed first.
  - **FIFO**: the inventory with the earliest inventory date is backflushed first.
  - **By Location**: the inventory on the location with the highest priority (defined in the Warehouse - Locations (whwmd3500m000) session) is backflushed first.

Serialized items

Serialized items can only be backflushed if in the Items - Warehousing (whwmd4500m000) details session the **Serials in Inventory** check box is cleared, and the **Register Serial Issue During As Built** field is **Yes**. In all other cases, serialized items cannot be backflushed.

If the serialized item is lot-controlled, the lot from which the items are backflushed is based on the outbound method (**Last In First Out (LIFO)**, **First In First Out (FIFO)**) as is defined in the Items - Warehousing (whwmd4500m000) details session.

Pick materials from the warehouse

The materials are backflushed after the production order is completed. However, the materials are already collected from the warehouse when working on the order, with the help of a material list. The person which collects the materials from the warehouse must pick the materials from the same lots as the lots that will be determined later by ERP LN on the hand of the **Lot Selection** field and the **Outbound Method** field during the backflushing procedure. That person

therefore has to apply the same rules as ERP LN when collecting the materials. Consequently, the picking instructions are based on the following factors:

The value of the Lot Selection field

If the **Lot Selection** field is:

- *Any*:The materials can be picked from any lot.
- *Same*: All materials must be picked from the same lot. If a lot does not contain enough material, another lot must be taken that contains enough material to cover the demand.
- *Specific*: The materials must be picked from the lot that is specified in the **Lot Code** field.

The value of the Outbound Method field

If the **Outbound Method** field is:

- *LIFO*: The materials that came last into inventory must be taken first.
- *FIFO*: The materials that came first into inventory must be taken first.
- *By Location*: The materials on the warehouse location with the highest priority (defined in the Warehouse - Locations (whwmd3500m000) session) must be taken first.

The best fit package structure

- Materials can be packaged in different ways. The best fit package structure indicates which package units you can pick best to collect your materials in a economical way. ERP LN also picks inventory according to these rules.

Example 1

Inventory:

1 pallet	(1 pallet is 20 boxes)
10 boxes	(1 box is 40 pieces)
55 pieces	

If the following is ordered	You pick
20 pieces	20 pieces
40 pieces	1 box
45 pieces	1 box and 5 pieces
75 pieces	1 box and 35 pieces
100 pieces	2 boxes and 20 pieces
800 pieces	1 pallet

Example 2

Inventory:

1 pallet	(1 pallet is 20 boxes)
10 boxes	(1 box is 40 pieces)

If the following is ordered	You pick

20 pieces	20 pieces from one of the boxes
40 pieces	1 box
45 pieces	1 box and 5 pieces of one of the boxes
75 pieces	1 box and 35 pieces of one of the boxes
100 pieces	2 boxes and 20 pieces of one of the boxes
800 pieces	pallet

Actual costing and backflushing

If you use actual costing, the backflushing of material and/or hours can be a factor of complication. All backflushing must be performed before an end-item is received in the end-item warehouse. If backflushing is not performed before the end-item is received in the warehouse, the costs are not included in the end-item's cost price. Consequently, the costs are not included in inventory valuation.

Actual costing and backflushing for production orders with operations

If you use actual costing in combination with backflushing for a production order with operations, ERP LN uses a built-in check to minimize the risk of booking costs too late. The result is that the Report Operations Completed (tisfc0130m000) session is no longer used to post end items to inventory. Instead, the following procedure applies:

1. Report a quantity as completed on the last operation, or report the whole last operation as completed by using the Report Operations Completed (tisfc0130m000) details session. Material and hours are backflushed (and costs are calculated), but the end items are not posted to inventory.

2. Report the production order (partly) as completed by using the Report Orders Completed (tisfc0520m000) details session. The materials were already backflushed using the Report Operations Completed (tisfc0130m000) details session in the previous step. Reply **Yes** to the question whether the end item(s) must be posted to inventory. The receipt of the end items in the warehouse takes place.

Note

Preferably, the **Backflushing Method** field in the Shop Floor Control Parameters (tisfc0500m000) details session is **Automatic** so you do not forget to backflush in time.

Actual costing and backflushing for production orders without operations

If you use actual costing and backflushing, and you have NO operations defined for your production order, ERP LN also uses a built-in check to minimize the risk of booking costs too late. The procedure is as follows:

1. Because the production order has no operations, you cannot use the Report Operations Completed (tisfc0130m000) session. Therefore, report as complete part of the production order, or the whole production order by using the Report Orders Completed (tisfc0520m000) details session. Answer **No** to the question of whether the end items must be posted to inventory. Backflushing must take place now, while the end item is not yet received in the warehouse.

2. You must receive the end-items in inventory manually by using the Warehouse Management inbound procedure. For more information, see To handle warehousing orders.

Note

Preferably, the **Backflushing Method** field in the Shop Floor Control Parameters (tisfc0500m000) details session is **Automatic** so you do not forget to backflush in time.

Chapter 4
Shop Floor Warehouses

4

Using shop floor warehouses

A work center can have a unique warehouse for short-term storage of the materials that are used in the work center. This type of warehouse is called a shop floor warehouse. No difference applies between the process to issue materials from a standard warehouse or from a shop floor warehouse.

If you use shop floor warehouses, the following procedure applies:

Material allocation

All materials are allocated in the warehouses specified in the bill of material (BOM), reflected in the Estimated Materials (ticst0101m000) session. If you define a shop floor warehouse for the operation's work center, the allocation of the material shifts from the warehouse defined in the BOM to the shop floor warehouse. The allocated material shifts to the shop floor warehouse during generation or release of the order, depending on the setting in the **Move Allocation to Shop Floor Warehouse** parameter in the Shop Floor Control Parameters (tisfc0100s000) session.

Issue of materials

When production starts, the materials for an operation that is performed in a work center to which a shop floor warehouse is linked are issued from this shop floor warehouse. You can perform this process manually or by means of backflushing, depending on the parameter setting.

Replenishment of shop floor warehouses

Shop floor warehouses can be replenished from the warehouse specified in the Estimated Materials (ticst0101m000) session. By default, this warehouse is the warehouse specified for the material in the Bill of Material (tibom1110m000) session (the BOM warehouse).

The way in which a shop floor warehouse is replenished depends on whether a push system or a pull system is used:

- In a push situation, replenishment is performed by generating planned orders of the **Planned Distribution Order** type in the Resource Requirement Planning module in Enterprise Planning, or by manually created warehousing orders with a **Transfer (Manual)** order origin.

- In a pull situation, replenishment is determined by the supply system defined in the Warehouse - Item (whwmd2510m000) session. The supply system can be:
  - Order Controlled/Batch setup and order generation: Only applicable in Assembly Control
  - Order Controlled/SILS setup, assembly kits, and order generation: Only applicable in Assembly Control
  - Order Controlled/Single setup and order generation: Only applicable in Shop Floor Control.
  - Time Phased Order Point (TPOP)
  - Kanban setup, label layout, and order generation

Transfer orders

If the supply system of a shop floor warehouse is **Order Controlled/Single**, transfer orders are generated during production order release. For material that is shipped from the central warehouse to the shop floor warehouse, a transfer order is generated for every applicable material cost line. Every transfer order consists of two parts: an **Issue** (outbound) line and a **Receipt** (inbound) line.

If changes occur in material requirements during production, these changes are reflected in the transfer order. For example:

- If the material quantity has changed, the quantity on the transfer order is updated.
- If a new material is used, a new material line is added to the transfer order.
- If a material is partly or completely canceled, the warehouse transfer can be partly or completely canceled if shipment is not executed yet. If the material is already shipped to the shop floor, you must return the material. A return transfer order is created to ship back the material to the central warehouse.
- If there is a shortage during the picking process, the remaining quantity is added as a new sequence line on the transfer order. Also if a shipping variance occurs, which means that more material is shipped then received in the shop floor warehouse, a new sequence line is added.
- If a specific revision, a lot, or a effectivity unit of a material is modified, this is mentioned on the transfer order so that the correct revision, lot, or effectivity unit is picked.

Use the Production Warehouse Orders (timfc0101m000) session to view transfer orders in relation to SFC orders.

You can modify a transfer order manually by adjusting the properties on the **Issue** line. The transfer **Receipt** line is then automatically changed. In the Inventory Handling Parameters (whinh0100m000) session, you can use the **Correct Outbound Quantity for SFC upto and including** fields and the **Correct Outbound Dates for SFC upto and including** fields to indicate until when you can still modify a transfer order.

Chapter 5
Warehousing

5

Integrations of SFC with warehousing

The following integrations exist between the Shop Floor Control module and Warehouse Management:

- The Inventory Planning module stores on-order quantities and planned inventory transactions.
- The Inventory Handling module handles the issue of materials and receipts of finished products.
- The Inventory Handling module is also involved in the posting of financial transactions and the handling of inspection orders.
- The Inventory Analysis module plans items with order system SIC and generates production orders.

Planned inventory transactions

When you create production orders in the Shop Floor Control module, the Inventory Planning module registers the order's planned inventory transactions. The Inventory Planning module also registers:

- Material allocations
- Inventory on order. For more information, refer to To determine on order dates.

Warehousing orders

The Inventory Handling module handles the issue of materials and receipts of finished products with warehousing orders. The warehousing order determines:

- Inbound and outbound procedures
- Lot selection and identification
- Warehouse locations.

ERP LN creates a warehousing order when you release a production order. When you modify the estimated materials, the warehousing order is updated

automatically. You can control the issue of materials in several ways. For more information, refer to *Overview of material issue (p. 1-1)* .

Inventory transactions

ERP LN records all <u>inventory transactions</u> in the Inventory Handling module in Warehouse Management. ERP LN uses these inventory transactions to create the appropriate <u>financial transactions</u>. For more information, refer to Integrations of SFC with finance.

When a component is issued, or when an end product is received, the warehousing order triggers the inspection order associated with the production order.

Generation of production orders

Items with <u>order system</u> SIC are planned in the Inventory Analysis module in Warehouse Management. You can transfer these orders to the Shop Floor Control module.

To define warehousing procedures

To model the inbound, storage, and outbound goods flows in your warehouse, you can define warehousing procedures in ERP LN. A <u>warehousing procedure</u> includes various steps called <u>activities</u> that control the way warehousing orders and/or handling units are processed. An activity is performed using a particular ERP LN session.

Link warehousing procedures to inbound and outbound goods

Initially, you define a warehousing procedure and link this procedure to a particular <u>warehousing order type</u>. As a result, the warehousing procedure is the default procedure for the warehousing orders to which the order type is allocated, and the goods are processed according to the procedure of the order on which the goods are listed.

If you use handling units to process goods into and/or out of the warehouse, the goods are processed according to the warehousing procedure of the warehousing orders that list the goods contained in the handling units.

You can adjust the default procedure for individual warehousing orders and warehousing order lines of this warehousing order type. If you adjust the default procedure for an individual warehousing order of this order type, the adjusted procedure applies to the inbound and/or outbound order lines of the warehousing order. You can also adjust the warehousing procedure for an individual inbound

or outbound order line. For further information, see How to modify warehousing procedures.

Automatic or manual execution of activities

You can specify whether an <u>activity</u> of a warehousing procedure must be carried out manually or automatically. Manually means that the user must perform the activity using the session related to the activity. Automatic means that the activity is carried out automatically after the preceding activity is finished. If the first activity is automatic for warehousing orders generated from orders originating from other packages, this activity is carried out the moment the warehousing order is generated. For information on how to define a warehousing procedure and specifying whether the activities of the procedure are carried out manually or automatically, see *How to define a warehousing procedure (p. 5-3)* .

However, to trigger warehouse processing for warehousing orders whose first activity is set to automatic processing and that are manually created or generated from Project, you must click Process.

The Process command is available in the following sessions:
- Warehousing Orders (whinh2100m000)
- Warehousing Order (whinh2100m100)
- Warehousing Order (whinh2100m100)
- Warehousing Assembly Order (whinh2101m000)
- Inbound Order Lines (whinh2110m000)
- Outbound Order Lines (whinh2120m000)

How to define a warehousing procedure

To define a warehousing procedure, take the following steps:

Step 1: Define procedure

In the Warehousing Procedures (whinh0105m000) session, define the identification code, the description and the procedure type of the warehousing procedure. The following warehousing procedure types are available:

- **Receipt Procedure**
  This procedure controls the receipts of goods
- **Inspection Procedure**
  The inspection procedure controls the inspection of goods received at the warehouse.
- **Outbound Procedure**
  The outbound procedure controls the issue of goods. This procedure can include outbound inspections.

■ **Shipment Procedure**
The shipment procedure controls staging and shipping of goods.

Step 2: Add activities to procedure

After you create a warehousing procedure, you must add <u>activities</u> to the procedure. To add activities, proceed as follows:

1. In the Activities by Procedure (whinh0106m000) session, in the **Warehousing Procedure** field, select the procedure to which you want to add activities. As a result, ERP LN displays the available activities related to the procedure type of the warehousing procedure you just selected. For example, if you defined a receipt procedure in the Warehousing Procedures (whinh0105m000) session and select this receipt procedure in the Activities by Procedure (whinh0106m000) session, ERP LN displays the available receipt activities. For further information, see Default activities by procedure.

2. To add an activity to the procedure, select the **Applicable** check box next to the activity. Note that most procedures have a few mandatory activities, such as Warehouse Receipts (whinh3512m000) in the **Receipt Procedure**, or Generate Outbound Advice (whinh4201m000) session in the **Outbound Procedure**. Mandatory activities are pre-selected by ERP LN and read-only. For further information, see **Applicable**.

3. To specify that the added activity must be carried out automatically, select the **Automatic** check box. If you do not select this check box, the user must manually trigger the activity.

4. For activities that involve printing documents, such as storage lists or shipping documents, in the **Output Device** field, select one of the output devices available in your organization.

Step 3: Link procedure to Warehousing Order Type

To link the procedure to warehousing orders, in the Warehousing Order Type (whinh0110m000) session, link the warehousing procedure to a <u>warehousing-order type</u>. As a result, the warehousing procedure is the default procedure for the warehousing orders to which the order type is allocated.

Step 4: Link Warehousing Order Type to Order Origin

To link the warehousing order type to order origins, in the Default Order Types by Origin (whinh0120m000) session, link the warehousing order type to an order origin. As a result, the warehousing order type (with the warehousing procedure previously allocated) is the default warehousing order type for warehousing orders generated from orders of the order origin to which the warehousing order type is linked.

Performance aspects

Keeping warehousing order line activities in your system after the warehousing order is closed results in considerable data growth. If you do not want to remove warehousing orders with status **Closed**, an alternative way to reduce the number of records in your system is to remove the order line activities of closed orders. To do this, in the Remove Warehousing Orders (whinh2250m000) session, select the **Line Activities of Closed Orders** check box. For further information, see Remove order line activities of closed orders.

Appendix A
Glossary

A

activity

A step in a warehousing procedure. An activity corresponds with a session of the Warehouse Management package. For example, the inbound activity **Generate Inbound Advice** is performed using the Generate Inbound Advice (whinh3201m000) session.

allocation

An item quantity that is assigned to a specific order but that is not yet released from the warehouse to production.

backflushing

The automatic issue of materials from inventory, or accounting for the hours spent manufacturing an item, based on theoretical usage and the quantity of the item reported as complete.

effectivity unit

A reference number on a sales order line or a sales quotation line that is used to model deviations for a unit effective item, or to peg purchase orders or production orders to a specific sales order line.

estimated quantity

The quantity of an item that is planned for use in a particular production order.

The estimated quantity is made up of the net quantity plus any additional quantities used to compensate for anticipated material losses.

financial transaction (FITR)

The transaction created to reflect a logistic event in Financials. The combination of a transaction origin (TROR) and the financial transaction (FITR) results in an integration document type.

floor stock

A stock of inexpensive material present on the shop floor that can be used in production without recording each issue of material individually. Floor stock is not backflushed and is not part of the estimated costs.

inbound

A procedure in which received goods are stored in a warehouse.

inventory on order

The planned receipts. The inventory that has been ordered but not yet received. This quantity is included in the economic stock.

Synonym: on-order inventory

inventory transaction

Any change in the inventory records.

location

A distinct place in a warehouse where goods are stored.

A warehouse can be divided into locations to manage the available space, and to locate the stored goods. Storage conditions and blocks can be applied to individual locations.

lot

A number of items produced and stored together that are identified by a (lot) code. Lots identify goods.

on-order inventory

See: *inventory on order (p. A-2)*

operation

One of a series of steps in a routing that are carried out successively to produce an item.

The following data is collected during a routing operation:
- The task. For example, sawing.
- The machine used to carry out the task (optional). For example, sawing machine.
- The place where the task is carried out (work center). For example, woodwork.
- The number of employees required to carry out the task.

This data is used to compute order lead times, to plan production orders and to calculate cost prices.

order system

The order parameter that controls the way by which recommended purchase and production orders are generated.

Options:
- **FAS** (final assembly scheduling).
- **SIC** (statistical inventory control).
- **Planned** (schedule-based and order-based planning).
- **Manual** (manual reordering).

outbound

The act of retrieving goods from a warehouse.

planned inventory transactions

The expected changes in the inventory levels due to planned orders for items.

quantity planned input

The quantity that should be given as input to an operation to get the required output, taking into account scrap quantity and yield percentage, and quantities reported completed and rejected.

The quantity planned input is the quantity of products on which calculations of materials and hours are based.

shop floor warehouse

A warehouse that stores intermediate inventory in order to supply work centers. A shop floor warehouse is linked to one or more work centers and can be supplied with goods by means of replenishment orders, or by pull-based material supply.

The pull-based material supply methods are:

- **Order Controlled/Batch** (only applicable in Assembly Control).
- **Order Controlled/SILS** (only applicable in Assembly Control).
- **Order Controlled/Single** (only applicable in Shop Floor Control).
- **KANBAN**.
- **Time-Phased Order Point**.

The items stored in the shop-floor warehouse are not part of the work in process (WIP). When items leave the shop floor warehouse for use in production, their value is added to the WIP.

Synonym: WIP warehouse

supply system

The system that is used to coordinate the timely supply of goods to the production lines or assembly lines.

The following supply systems are available in ERP LN:

- **Time-Phased Order Point**
- **KANBAN**
- **Order Controlled/Batch**
- **Order Controlled/SILS**
- **Order Controlled/Single**

warehouse order

See: *warehousing order (p. A-5)*

warehousing order

An order for handling goods in the warehouse.

A warehouse order can be of the following inventory-transaction types:

- **Receipt**
- **Issue**
- **Transfer**
- **WIP Transfer**

Each order has an origin and contains all the information required for warehouse handling. Depending on the item (lot or non-lot) and warehouse (with or without locations), lots and/or locations can be assigned. The order follows a predefined warehousing procedure.

> **Note**
>
> In Manufacturing a warehousing order is often called a warehouse order.

Synonym: warehouse order

warehousing order type

A code that identifies the type of a warehousing order. The default warehousing procedure that you link to a warehousing order type determines how the warehousing orders to which the order type is allocated are processed in the warehouse, although you can modify the default procedure for individual warehousing orders or order lines.

warehousing procedure

A procedure to handle warehousing orders and handling units. A warehousing procedure comprises various steps, also called activities, that a warehousing order or a handling unit must take to be received, stored, inspected, or issued. A warehousing procedure is linked to a warehousing order type, which in turn is allocated to warehousing orders.

WIP warehouse

See: *shop floor warehouse (p. A-4)*

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