Infor LN Manufacturing User Guide for Material Issue

Publication Information

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About this document

This document describes the setup of material issue for various manufacturing processes. The manual and automated processes of issuing material are described, along with steps in the processes and the setup process.

Intended audience

This document is intended for persons in charge of the setup and maintenance of job shop 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

1

Overview of material issue

The entering of issues as part of the order procedure for production orders is required to issue the necessary materials from the warehouse to the job shop. Issuing can be done manually or by the system while the estimate is being built up.

When backflushing applies, issuing of inventory is automatically carried out.

Note: If multisite is activated, material issue is performed for a item linked to a specific planning cluster.

- **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. 21)*.

- **Floor stock**
  A stock of inexpensive material present on the job shop 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 standard cost of an end item. A Kanban triggers the supply of floor-stock items to the job shop. You can create a warehousing order of type **JSC 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 job shop 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 allocated for the production order.

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

If you use job shop warehouses, you can determine the moment that the material is allocated in the job shop warehouse.

- **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 Production Order Parameters (tisfc0100s000) session, 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.

- **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.

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

- **Receive material**
  The desired material quantity is received on the job shop.

To handle material from the warehouse to the job shop, and from the job shop 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, it is recommended 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 in Manufacturing

The detailed warehouse handling of material, and end items enables you to:

- To differentiate between *canceling* a quantity while still in the warehouse, and *returning* a redundant quantity from the job shop to the warehouse.

- Return a specific lot code, or serial number to the warehouse. This is useful if multiple lots or serial numbers of the same material are used in one production order.

- Specify different planned issue dates, or receipt dates for a material or production order. 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 Warehouse Order Line** check box is selected in the Item - Production Defaults (tiipd0102m000) session), 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 production warehouse orders

In the **Material** view of the Production Warehouse Orders (timfc0101m000) session, 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 issue material from the warehouse:

1. Specify the quantity that you want to issue in the header in the **To Issue** field.
2. In the <u>appropriate</u> 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 <u>appropriate</u> menu.

If you want to *cancel* a material quantity, you must also specify the quantity in respectively the **To Return** field or the **To Cancel** field in the header, and then click Process in the <u>appropriate</u> menu.

If the **Blocked** check box is cleared, you cannot manually change the quantity in the **Quantity Ordered** field anymore to cancel a specific quantity to be issued from the warehouse you must cancel the quantity by doing the following:

1. Specify the quantity that you want to cancel in the **To Cancel** field in the header , or in the **Quantity to Cancel** field for a specific production warehouse order. For example, if the ordered quantity for a specific material is 8, but you need only 6, you must enter 2 in the **To Cancel** field.

   If a material distribution is present, you must cancel the quantity on the appropriate production warehouse orders. If there is no material distribution, you can cancel the quantity in the **To Cancel** in the header.

2. In the <u>appropriate</u> menu, click Process. The ordered quantity is corrected in Warehousing. Whether the corrected ordered quantity is displayed in this session depends on how far the warehouse outbound procedure has already progressed:

   - If the warehouse outbound procedure has not started yet, or is in an early stage, the ordered quantity of the appropriate production warehouse order is adjusted: The quantity that you typed in the **To Cancel** field is subtracted from the quantity in the **Quantity Ordered** field, and the **To Cancel** field is set back to 0 (zero).

   - If the warehouse outbound procedure is already too advanced, the **Quantity Ordered** for the production warehouse order is not adjusted anymore. However, the canceled quantity is displayed in the **Quantity Canceled** field so that warehouse employees know that this quantity does not need to be picked in the warehouse. The **To Cancel** field is set back to 0 (zero).

To return a quantity, carry out the following steps:

1. Type the quantity you want to return in the **Return Quantity** field.
2. Optionally, specify a reason code in the **Return Reason** field, and a order type in the **Return Order type** field.

3. If required, specify the type of selection to use in the **Select Lot / Serial** field, after which you can specify lot codes or serial numbers in the Return Lots and Serials (whinh2149m000) session.

    If the **Multiple Lots** check box and the **Multiple Serials** check box are cleared, only one serial number or lot code, or no serial numbers/lot codes apply to the production warehouse order. If you carry out the next step, click **Create Return**, the lot code or serial number from the current production warehouse order is automatically copied to the return order. If no lot code is defined, a return order without a lot code is created.

4. Click **Create Return**. The production warehouse order for the specified quantity is created.

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.

Example

There are two production orders, one for issue and one for subsequent delivery. 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.

Example

An order distribution as defined in the Production 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 (tcibd0501m000) session, and the **Lots in Inventory** check box is selected in the Items - Warehousing (whwmd4500m000) session. One production warehouse order is generated for every involved effectivity unit.

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 (tcibd0501m000) session, also only one production warehouse order is present.

Search for lot number or serial number

If you must find orders related to a specific lot number or serial number, you can use the Production Warehouse Orders Overview (timfc0101m100) session.

A 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.

Material issue strategies

Methods

LN offers you various levels of control for the issue of materials. You can specify a different method for each material.

- Available methods to control the quantity of the issue:
    - Direct user control over the quantities to issue
    - Quantities determined by the allocations
- Available methods to control the time of the issue. LN issues the material:
    - After a user gives a command
    - At the allocation date
    - Immediately when the production order is released
- Special methods:
    - Backflushing
    - Floor stock

You can influence the issue process with parameters such as:

- **Direct Process Warehouse Order Line**
- **Backflush Materials**

The **Manual Issuing** check box in the Production Order Parameters (tisfc0100s000) session influences the issuing process of all materials. Materials are issued when you choose the Transfer Subseq. Delivery to Issue command in the Material to Issue for Production Orders (ticst0101m100) session.

If you apply backflushing, LN issues the material when you report a quantity of the end product as **Completed** or **Rejected**.

You can keep inexpensive materials present in the job shop as floor stock. Floor stock is not allocated to a warehouse and is not included in material costs. To account for floor stock materials, a surcharge

is added to the <u>standard cost</u> of an end item. The supply of floor-stock items to the job shop is triggered by Kanban. A warehousing order of the **Production** type can be created in which you determine from which warehouse and to what work center the material must be shipped.

Material issue setup

In the Production Order 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 job shop floor manually or automatically.

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 job shop.

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 Estimated Materials (ticst0101m000) session.

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

1. Release the production order. 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 <u>appropriate</u> 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, 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. 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** check box is selected in the Inventory Handling Parameters (whinh0100m000) session. If a shortage arises, and the **Negative Inventory** 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.

Chapter 2
Controlled Material Issue

2

Material issue parameters

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

- **Floor Stock**
  Determines whether the material is <u>floor stock</u>. The **Floor Stock** check box is located in the Item - Warehousing (whwmd4600m000) session.

- **Backflush Materials**
  Determines that LN issues material through <u>backflushing</u>. You can find this parameter in the Item - Production (tiipd0101m000) session. For more information refer to *Setting up backflushing (p. 22)*.

- **Manual Issuing**
  Determines whether you need to manually specify the material quantity that must be issued. For more information, refer to *Material issue setup (p. 12)*.

- **Direct Initiate Inventory Issue**
  Determines whether material is automatically unblocked in the warehouse after the production order is released. For more information, refer to *Releasing material (p. 17)*.

- **Direct Process Warehouse Order Line**
  Determines whether the warehouse procedure is carried out automatically when you issue material. For more information, refer to *Automatic processing warehouse order lines (p. 18)*.

Material issue setup

In the Production Order 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 job shop floor manually or automatically.

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 job shop.

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 Estimated Materials (ticst0101m000) session.

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

1. Release the production order. 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 appropriate 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, 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. 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** check box is selected in the Inventory Handling Parameters (whinh0100m000) session. If a shortage arises, and the **Negative Inventory** 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.

Releasing 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.

To specify wether the material must be released manually or automatically:

- **Direct Initiate Inventory Issue selected**
  LN automatically unblocks the warehouse order line for the material during production order release.
- **Direct Initiate Inventory Issue cleared**
  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 Transfer Subseq. Delivery to Issue in the Material to Issue for Production Orders (ticst0101m100) session. LN now moves the material quantity from the **To Issue** field to the **To Issue by Warehousing** field.
- The activated warehousing order line:
  - 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 Item - Production (tiipd0101m000) session, where you can set the default value for a specific item, or in the Item - 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 job shop can determine whether the material must be unblocked manually or automatically.

Releasing 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.

To specify wether the material must be released manually or automatically:

- **Direct Initiate Inventory Issue selected**
  LN automatically unblocks the warehouse order line for the material during production order release.

- **Direct Initiate Inventory Issue cleared**
  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 Transfer Subseq. Delivery to Issue in the Material to Issue for Production Orders (ticst0101m100) session. LN now moves the material quantity from the **To Issue** field to the **To Issue by Warehousing** field.

- The activated warehousing order line:
  - 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 Item - Production (tiipd0101m000) session, where you can set the default value for a specific item, or in the Item - 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 job shop can determine whether the material must be unblocked manually or automatically.

Automatic processing warehouse order lines

After a warehouse order line is unblocked, as described in *Releasing material (p. 17)*, the warehouse order line must be processed in Warehousing. The **Direct Process Warehouse Order Line** check box in the Item - 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 LN carries out the warehouse procedure automatically.

- **Direct Process Warehouse Order Line check box selected**
  You do not need to carry out the warehouse procedure manually for the material when you issue material. The material is available directly in the job shop 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.

■ **Direct Process Warehouse Order Line check box cleared**
You must carry out the warehouse procedure manually for the material in Warehousing before the material can be shipped to the job shop. How the procedure is carried out is defined in Warehousing. For more information, refer to *To define warehousing procedures (p. 34)*.

Chapter 3
Backflushing

3

Backflushing

If you do not want to record every issue of a material or every spent production hour individually, you can apply backflushing 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. With the material shipped to the place of manufacture and consumed, to be administratively accounted for on the order later.

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 job shop. 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

Setting 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 materials**
  Use the following settings in the Item - 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 Order (tisfc0101s000) session.
  You can modify these check boxes for a particular production order. LN backflushes the material only if you select both of these check boxes.

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

- **Backflushing 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 Item - Production (tiipd0101m000) session.
  When you define an operation 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, 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 Item - Production (tiipd0101m000) session determines the default setting of the **Backflush Hours** check box in the Production Order (tisfc0101s000) session.
  You can modify these check boxes for a particular production order. LN backflushes the hours only if you select both of these check boxes.

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

To make backflushing of hours possible, you must also:

- Enter a value in the **Default Labor Resource** field in the Work Centers (tirou0101m000) session.
- Enter a value in the **Labor Type** field in the Production Order 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 Lot Issue During As Built** field in the Item - Warehousing (whwmd4600m000) session 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.

- **Backflushing in Job Shop**
  Set the following parameters in the Production Order 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 in Repetitive Manufacturing**
  You can manage materials backflushing in the Repetitive Manufacturing Parameters (tirpt0100m000) session. Depending on the selected **backflushing method**, backflushing is triggered after quantities end item are reported completed, when a shift is reported completed, or one of the other triggers.

  Backflushing updates the work cell cost document.

Note

If you use the DEM Content Pack with Infor LN, consider using the MMN0220 (Backflushing for Production Orders) wizard to set up backflushing. You can execute this predefined wizard from the Wizards by Project Model (tgwzr4502m000) session after you specified the business function model for your company.

Backflushing procedure

LN carries out backflushing 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 Production Order Parameters (tisfc0100s000) session:

- **Automatic**: backflushing proceeds without user interaction.
- **Interactive**: 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:

LN processes the issued materials and the accounted hours:

- *Process backflushed materials (p. 25)*
- 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 (ticst0101m100) session.
- Through the Hours and Expenses by Employee Overview (bptmm1100m000) session. 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

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

For details about the calculation of the quantities to issue through backflushing, see *Calculate backflush quantity (p. 24)*.

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

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

Note

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

Collecting backflush materials from the warehouse

The backflushing of materials takes place when you report a quantity completed (see *Backflushing procedure (p. 23)*). LN calculates and processes the quantities that must be backflushed.

From which inventory the materials are backflushed depends on the value of 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 (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 Item - Warehousing (whwmd4600m000) details session the **Serials in Inventory** check box is cleared, and the **Register Lot 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 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 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. 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 <u>backflushing</u> 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 standard cost. 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, it is important that the backflushing is done before the end item is received in the specified warehouse.

If the **Backflushing Method** is set to **Manual** in the Production Order Parameters (tisfc0100s000) session the procedure is:

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. Note: the end items cannot be posted to inventory in the situation described.
2. Run the Backflush Materials and Hours (tisfc0220m000) session.
3. Report a quantity of the production order (partly) completed by using the Report Orders Completed (tisfc0520m000) details session. 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.

If the **Backflushing Method** field in the Production Order Parameters (tisfc0100s000) is set to **Interactive**, then the same result can be achieved by answering **Yes** to the question "Backflush materials/hours immediately?"

If the **Backflushing Method** field in the Production Order Parameters (tisfc0100s000) is set to **Automatic**, the end item can be posted to inventory.

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, 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 Warehousing inbound procedure. For more information, see Warehousing orders.

Note

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

Chapter 4
Shop Floor Warehouses

<div style="text-align: right">**4**</div>

Shop floor warehouses

Shop floor warehouses are a special kind of warehouse that store and control the materials needed for production. An <u>shop floor warehouse</u> is linked to a work <u>work center</u> by which materials needed for operations can be pulled from inventory in the shop floor warehouse linked to that operation such as a location on the line.

A <u>work center</u> can have a unique warehouse for short-term storage of materials that are used called <u>shop floor warehouse</u>. The distinction is administrative, the same process to issue materials is used for both the standard and shop floor warehouses.

All materials needed for a <u>production order</u> are <u>allocated</u> to the warehouses specified in the <u>bill of material (BOM)</u> or the Estimated Materials (ticst0101m000) session. If a shop floor warehouse is defined for the operation's work center, and depending on the **Move Allocation to Shop Floor Warehouse** check box setting in the Production Order Parameters (tisfc0100s000) session materials are moved to this shop floor warehouse during generation or release of the production order.

After production starts, materials for the operations are issued from the shop floor warehouses that are linked to the work centers in which the operations are performed, this is done either manually or by <u>backflushing</u>. Shop floor warehouses are replenished from the warehouse specified in the Estimated Materials (ticst0101m000) session.

Shop floor warehouses are replenished from the warehouse specified in the Estimated Materials (ticst0101m000) session. Usually this is the warehouse specified for the material in the Bill of Material (tibom1110m000) session. 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 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 Item Data by Warehouse (whwmd2510m000) session.

  The <u>supply system</u> 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 Job Shop Control.
- Time Phased Order Point (TPOP)
- Kanban

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.
- 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 job shop, 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 JSC 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 JSC upto and including** fields and the **Correct Outbound Dates for JSC upto and including** fields to indicate until when you can still modify a transfer order.

Chapter 5
Warehousing

5

Integrations of JSC with warehousing

The following integrations exist between the Job Shop Control module and Warehousing:

- The Inventory Planning module stores on-order quantities and planned inventory transactions.
- The Warehouse Orders module handles the issue of materials and receipts of finished products.
- The Warehouse Orders 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 Job Shop 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 Warehouse Orders 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.

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. 7)*.

Inventory transactions

LN records all <u>inventory transactions</u> in the Warehouse Orders module in Warehousing. LN uses these inventory transactions to create the appropriate <u>financial transactions</u>. For more information, refer to Integrations of JSC 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 Warehousing. You can transfer these orders to the Job Shop Control module.

To define warehousing procedures

To model the inbound, storage, and outbound goods flows in your warehouse, you can define warehousing procedures in 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 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.

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.

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)
- Warehouse Manager Dashboard (whinh2300m000)
- Warehousing Assembly Orders (whinh2101m000)
- Inbound Order Lines (whinh2110m000)
- Outbound Order Lines (whinh2120m000)

Appendix A
Glossary

A

activity

A step in a warehousing procedure. An activity corresponds with a session of the Warehousing 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.

appropriate menu

Commands are distributed across the **Views**, **References**, and **Actions** menus, or displayed as buttons. In previous LN and Web UI releases, these commands are located in the *Specific* menu.

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.

bill of material (BOM)

A list of all parts, raw materials, and subassemblies that go into a manufactured item and show the quantity of each of the parts required to make the item. The BOM shows the single-level product structure of a manufactured item.

business-function model

A part of a business model that is built from a selection of business functions that are initially created in the repository.

effectivity unit

A reference number, for example a sales order line or a project deliverable line, that is used to model deviations for a unit effective item.

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 in the job shop 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 has been received and the inbound advice is generated. However, the advice is not yet released. 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.

material

The raw materials, components, and subassemblies used to manufacture an item. A cost item, for example, electricity, can also be treated as a material.

multisite

Refers to the management of multiple sites within a single (logistic) company.

In a multicompany structure, which includes several companies, multisite applies to each of the logistic companies.

on-order inventory

See: *inventory on order (p. 38)*

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 standard cost.

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.

planning cluster

An object used to group warehouses for which the inbound and outbound flow of goods and materials is planned collectively. For this purpose, the demand and supply of the warehouses of the planning cluster is aggregated. Within a planning cluster one supply source is used, such as production, purchasing or distribution.

If multisite is implemented, a planning cluster must include one or more sites. The site or sites include the warehouses for which the planning processes are performed.

production order

An order to produce a specified quantity of an item on a specified delivery date.

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.

serial number

The unique identification of a single physical item. LN uses a mask to generate the serial number. The serial number can consist of multiple data segments that represent, for example, a date, model and color information, sequence number, and so on.

Serial numbers can be generated for items and for tools.

shop floor warehouse

A warehouse that stores intermediate inventory in order to supply work centers. A shop floor warehouse is linked to an individual work cell, an assembly line, or one or more work centers. A shop floor warehouse can be supplied with goods using 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 Job Shop 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.

standard cost

The sum of the following item costs as calculated by the standard cost calculation code:

- Material costs
- Operational costs
- Surcharges

Prices that are calculated against other price simulation codes are simulated prices. The standard cost is used for simulation purposes and in transactions when no actual price is available.

Standard cost is also an inventory valuation method for accounting purposes.

supply system

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

surcharge

The indirect costs of an item, for example, overhead costs, storage costs, handling costs, and machine-maintenance costs. Surcharges can be defined as a percentage or as a fixed amount and can contribute to fixed and variable costs.

warehouse order

See: *warehousing order (p. 41)*

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.

wizard

A special form of user assistance that automates a task by setting the parameter values within a business model and which directs the software to meet the specific requirements of an organization.

work cell

A production unit consisting of one or more work stations in a fixed sequence.

A work cell is used in repetitive manufacturing for the production of a repetitive item.

work center

A specific production area consisting of one or more people and/or machines with identical capabilities, that can be considered as one unit for purposes of the capacity requirement planning and detailed scheduling.

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