



Infor LN Manufacturing User Guide for Use-up and Alternative Materials

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About this Guide

This document explains material management during production. When materials are unavailable in necessary quantities, they are substituted with alternative materials. If materials are still in stock, but will no longer be replenished, you can define options for use-up of the remaining stock.

Document summary

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Chapter 1: Introduction Use-up and Alternative Materials

Overview of use-up materials and alternative materials

You can use the use-up functionality to ensure that material, used in previous revisions of the *end item*, is used up completely before new material is utilized. This prevents a buildup of inventory that may become obsolete.

The use-up functionality can be used in both Job Shop and Assembly.

You can use *alternative materials* to handle shortage problems during production, and to reduce cost.

BOM materials are often small parts that are ordered in large quantities, for which several alternatives are available. In case of shortage, the material specified as preferred in the *bill of material (BOM)* as is ordered.

If the material cannot be ordered in time to fulfill the requirement an alternative material is chosen.

Parameters for Alternative and Use-up Materials

Chapter 2: Setup for Use-up and Alternative Materials

Defining alternative materials

This topic describes several sessions you can use to define *alternative materials* for materials in *bills of material (BOMs)*.

Note: This functionality is available only if the Alternative Materials check box is selected in the **Implemented Software Components (tccom0100s000)** session.

Alternative materials in BOMs

To define *alternative materials* in BOMs, you can use the following procedure:

- 1 Start the **Bill of Material (tibom1110m000)** session, go to the relevant BOM, and double-click the *BOM line* to start the details session.
- 2 If you want to permit more than one item to be used for one material requirement select the Allow Multiple Items check box.
- 3 Click **Use Up and Alternative Materials**.
- 4 Insert the alternative materials in the Use Up and Alternative Materials (tibom0150m000) session.

Batch-wise definition of alternative materials

To define alternative materials for multiple BOMs at once, use the Copy Item to Alternative Materials (tibom0250m000) session.

Alternative materials in Engineering BOMs (EBOM)

To define alternative materials in EBOMs, take the following steps:

- 1 Start the Engineering Bill of Material (tiedm1110m000) session, go to the relevant EBOM and double-click the BOM line to start the details session.
- 2 If you want to permit more than one item to be used for one material requirement, select the Allow Multiple Items check box.
- 3 Click **Use Up and Alternative Materials by Engineering BOM**.
- 4 Insert the alternative materials in the Use Up and Alternative Materials by Engineering BOM (tiedm2115m000) session.

You can copy the EBOM with the EBOM's alternative materials to a production BOM. For more information, refer to the Engineering BOMs topic.

Chapter 3: Use-up and Alternative Materials

Alternative materials in BOMs

Some *items* are interchangeable even when these are purchased from various vendors. You can use any of these items as material in a bill of material (BOM). If a shortage of a standard material is expected to delay a *production order*, LN can automatically select one of the alternative materials. You can define up to nine *alternative materials* for any material in a BOM.

The use of alternative materials has the following advantages:

- LN can handle material shortages for some items without user intervention.
- The use of alternative items can reduce the average inventory level.

Alternative materials in Assembly BOM

In Assembly, alternative materials are managed in the Assembly Planning module.

Your Concept

Alternative Materials in PBOM

Your Concept

Alternative materials JSBOM

You can set up and manage alternative materials for Job Shop BOMs in the following way:

Note:

- If *multisite* functionality is active, standard and alternative materials are managed for a specific *planning cluster*.
- *Alternative materials* apply for *production orders* only, not for subcontracted *purchase order*.

- You must distinguish the alternative materials, described in this topic, from the *alternative items* that you define in the Alternative Items (tcibd0505m000) session.
- The standard cost calculation does not take alternative materials into consideration. Calculations are done based on the cost of the material specified in the JSBOM.

Restrictions

- Alternative materials have the same *net quantity* as the standard material.
- Alternative materials have exactly the same values of characteristics such as the *scrap* and *yield* as the standard material.
- Use-up materials and alternative materials have the same material-routing relationships as the standard item.
- If a component on a *BOM line* is a standard item, that is, an item with an empty project *segment*, the associated alternative materials must also be standard components.
- If a component on a *BOM line* is a *project item*, that is, an item with a filled project segment, the associated alternative materials' project segments must be either:
 - Filled with the same project as the main item's project segment.
 - Empty (the alternative is a standard item)
- If a component on a BOM line is a *phantom*, you cannot define alternative material for that component.
- Priority of an alternative material

You can specify the priority of each alternative material. If the standard material is out of stock, LN first tries the highest-priority alternative. If that material is also unavailable, LN tries the alternative that has the next priority.

- To distribute a material requirement over multiple items

If, on a *BOM line* in the **Job Shop List of Material (tibom3610m000)** session, the Allow Multiple Alternatives check box is selected, LN can split a material requirement over multiple alternative materials or partly fulfilled by the materials.

Example: If ten pieces are needed and only six pieces of the requested material are available, first the six pieces of the original are used then four pieces of the alternative to fill the full quota.

- Checks for alternative materials

At one or more of the following points in a production order's life cycle, depending on parameter settings, LN can check whether an alternative material must be used:

- When you generate *planned production orders* in Enterprise Planning.
- When a *production order* is created in Job Shop Control.
- When you run the **Generate Alternatives for Estimated Materials (ticst0216m000)** session for existing production orders.
- When you generate an *outbound advice* in Warehousing.

For more details, refer to the Searching for alternative materials topic.

Searching for alternative materials

This topic describes how and when LN automatically takes an *alternative material* for a *production order* instead of a standard material.

Note:

- To search for *alternative material* the Alternative Materials parameter in the Implemented Software Components (tccom0100s000) session must be selected.
- If *multisite* is activated, standard and alternative materials are planned and issued per *planning cluster*. A planning cluster contains one or more sites, for which an available-to-promise check will generate cumulative results.
- How does LN perform the checks
LN performs the checks for alternative materials according to the following principles:
 - Each alternative material has a priority.
 - If the standard material is out of stock, LN first tries the highest-priority alternative. If that material is also unavailable, LN tries the alternative that has the next priority, and so on.
- Material availability
LN uses the following methods to determine if an alternative material is available on the required date:
 - In the Enterprise Planning package
LN checks the material's quantity *available-to-promise*.
 - In the Job Shop Control module
LN checks the material's time-phased economic stock.
 - In the Warehousing package
LN checks the material's *inventory on hand*.
- To distribute a material requirement over multiple materials
If, on a *BOM line* in the **Job Shop List of Material (tibom3610m000)** session, the **Allow Multiple Alternatives** check box is selected, LN can split a material over multiple alternative materials and the original material.
Multiple sessions have a check box named **Allow Multiple Alternatives**:
 - The **Allow Multiple Items** check box in the **Production Bill of Material Lines (timfc3110m000)** session is relevant for the generation of *planned orders* and production orders.
 - The **Allow Multiple Alternatives** check box in the **Job Shop List of Material (tibom3110m000)** session for the generation of the outbound advices.

Example 2: Alternative materials

Material X has two alternatives: X1 and X2. The following table shows the inventory situation.

Item	Inventory	Priority
X	20	(standard)
X1	30	1
X2	1200	2

For a particular production order, you need a quantity of 100 pieces of X.

If multiple items are permitted, LN takes the following materials:

- 20 pieces of the standard material (X)
- 30 pieces of the first alternative material (X1), and
- 50 pieces of the second alternative material (X2)

If multiple items are not permitted, LN plans 100 pieces of alternative material X2, because none of the higher-priority materials are available in sufficient quantities.

- When does LN perform the checks

At one or more of the following points during a production order's life cycle, LN can check the timely availability of standard materials and alternative materials:

- LN performs these checks when the *order-planning* procedure in Enterprise Planning generates *planned production orders*.
- If the **Automatic Select Alternatives** field in the **Production Order Parameters (tisfc0500m000)** session is set to **At Generation**, LN performs these checks when you create a *production order* or transfer a planned production order to the Job Shop Control module.
- If the **Automatic Select Alternatives** field in the **Production Order Parameters (tisfc0500m000)** session is set to **At Release**, LN performs these checks when you release a *production order*.
- You can perform these checks manually by using the **Generate Alternatives for Estimated Materials (ticst0216m000)** session.

You can use this session until the estimated materials are frozen. The estimated costs are frozen if the Estimated Costs Frozen check box in the **Estimated Materials (ticst0101m000)** session is selected.

- You can check again for material shortages and select alternative materials at the moment when you generate an *outbound advice* in the Warehousing package. To do so, you must select the **Handle Alternative Items** check box in the **Process Outbound Advice (whinh4200m000)** session, or select the **Handle Alternative Items** check box in the **Generate Outbound Advice (whinh4201m000)** session.
- Repeated material checks

In general, if LN repeats the material availability check and a sufficient quantity of the currently selected material is available, LN does not change the material allocation, even if a higher-priority alternative material or the standard material has meanwhile become available. This policy avoids a nervous planning process that repeatedly changes the material allocations.

However, if you want to make sure that the standard material or the highest-priority alternative material is used in a production order, you can use the **Generate Alternatives for Estimated Materials (ticst0216m000)** session to recheck all possible materials at any time. In that case, you must select the **Always Reconsider Alternatives** check box.

Example:

Suppose that the following events occur:

- During the creation of a production order, LN takes an alternative item because of an anticipated shortage for the standard material at the material allocation date.
- Before the allocation date for the material, you unexpectedly receive an inbound shipment of the standard material that is sufficient to fulfill the material requirement.
- Next, you generate the *outbound advice* in the Warehousing package.

If the currently selected alternative material is available, LN does not change the material allocation and issues the alternative material from the warehouse to the job shop, regardless of the availability of the standard material.

To force LN to check again for the availability of the standard material, start the **Generate Alternatives for Estimated Materials (ticst0216m000)** session and select the **Always Reconsider Alternatives** check box.

Checking Use-up Material Definitions

In the Use Up and Alternative Materials (tibom0150m100) session you can check the items, according to the following procedure:

- 1 LN identifies the *items* that are part of the item range you entered and that are defined as a material of a *bill of material (BOM)* in the Job Shop List of Material (tibom3610m000) session.
- 2 From these items, LN selects the items for which the **Planner** field in the Items - Ordering (tcibd2100m000) session names a planner that is part of the range of *shop floor planners* that you entered.
- 3 From these items, LN selects the items for which a date is recorded in the Last Allowed Order Date field. (These items have been phased out or will be phased out).
- 4 For each of these items, LN checks if the last allowed order date is not before the date in the Expiry Date field of the *BOM line*.
- 5 If the last allowed order date is before the expiry date, LN checks if the BOM line has any alternative materials.
- 6 If the last allowed order date is before the expiry date and no alternative materials are present for a BOM line, the BOM line is specified in an error report.

Using up remaining stock of outdated items

Often, new *items* are introduced that make other items obsolete. The obsolete items are no longer deliverable or the items are no longer manufactured.

If an outdated item is used as material in a job shop bill of material, you must replace the material by a replacement item with the same specifications.

If a quantity of outdated material remains in stock, it must be used up first.

Restrictions

- Use-up materials have the same *net quantity* as the standard material.
- Use-up materials have exactly the same values of characteristics such as the scrap and yield as the standard material.
- Use-up materials have the same material-routing relationships as the standard item.
- If a component on a *BOM line* is a standard item, that is, an item with an empty project *segment*, the associated use-up must also be standard components.
- If a component on a *BOM line* is a *project item*, that is, an item with a filled project segment, the associated use-up project segments must be either:
 - Filled with the same project as the main item's project segment
 - Empty (the alternative is a standard item)
- If a component on a BOM line is a *phantom*, you cannot define a use-up material for that component.

Checks for use-up materials

At any of the following moments, depending on parameter settings, LN can check whether you must use any use-up material:

- When you generate *planned production orders* in the Enterprise Planning package.
- When the system generates a *production order* in the Job Shop Control module, or if you release a production order.
- When you generate an *outbound advice* in the Warehousing package.

To use revisions and lot control instead of use-up materials

If you use the Engineering Data Management module to control changes in a job shop bill of material and you link subsequent *revisions* to the same item code on a *BOM line*, you cannot apply the use-up functionality.

For that situation, you can apply *lot* control and use the **FIFO** outbound method. That outbound method ensures that you use up the outdated revision before you take the new revision.

Replacing outdated materials and designating use-up materials in JSBOMs

This topic describes how to replace an outdated material with a replacement material in a job shop *bill of material (BOM)* and specify the outdated material as a *use-up material*.

Note:

If you use Engineering Data Management to control changes in a BOM, this procedure does not apply.

- 1** Start the **Job Shop List of Material (tibom3610m000)** session
Specify the site, Product, bill of material and revision for which you want to replace the material.
- 2** Specify the material from the previous bill of material revision which you want to replace.
- 3** On the Alternative Materials tab, Insert BOM line
The BOM line must have the same *BOM position number* as the outdated component

Chapter 4: Planning

Use-up materials and alternative materials in Enterprise Planning

This topic describes how Enterprise Planning handles *use-up materials* and *alternative materials*.

Note:

- This functionality is available only if the Alternative Materials and Use Up Material check boxes in the **Implemented Software Components (tccom0100s000)** session is selected.
- If *multisite* is activated, all materials must come from warehouses linked to the same *site*, and belonging to the same *planning cluster*.
- A planning cluster can contain one or more *sites*, ATP checks are done for the whole planning cluster so that the results contain cumulative inventory results for all sites linked to the planning cluster.
- In the Items - Ordering (tcibd2100m000) session, you can view or maintain the last allowed order date and the safety stock by *site*.
- LN also checks for a *use-up material* that must be used up first.
- The value of the ATP/CTP horizon of alternative materials must be greater than the alternative material horizon. Beyond the ATP/CTP horizon, LN assumes that the material is unlimited available.

Planning with alternative materials

The *order-based planning* process checks whether the *projected inventory* stays above the *safety stock* if you use the standard material to fulfill the material requirement for the planning cluster for which order planning is done.

If the projected inventory drops below the safety stock, LN searches for a *firm-planned order* that can be rescheduled to an earlier date to fill the requirement.

If LN finds no such order, LN checks the *available-to-promise (ATP)* quantity of the component's alternative materials (in priority order) across the whole planning cluster. If ATP finds an alternative material, the material requirement is shifted to that alternative material.

If the ATP is insufficient, LN will generate a new *planned order* for the standard material for the specified planning cluster.

If the material requirement cannot be fulfilled in time, LN generates a *signal* to notify the planner.

Alternative material horizon

For material requirements in a relatively far future, LN does not check for alternative materials.

To determine how far into the future LN checks for alternative materials, use the **Alternative Materials Horizon** field in the **Scenarios (cprpd4100m000)** session.

Allow multiple materials

If the Allow Multiple Alternatives check box in the **Job Shop List of Material (tibom3610m000)** session is selected for the specific item and site combination, LN can distribute the *estimated quantity* of the material over multiple items.

For example, the estimated quantity can be divided over the *use-up material* and the standard material or over the standard material and one or more *alternative materials*.

If you do not permit multiple items, LN makes a choice for each material line: LN issues either the standard material or the alternative material, but not a combination of two or more materials.

For examples, refer to Searching for alternative materials.

RestrictionsThe following restrictions apply:

- The selection of use-up materials and alternative materials is only available in *order-based planning* and not in *master-based planning*
- The materials must be available in the warehouses linked to sites which belong to the selected planning cluster.
- The *capable-to-promise* checks do not take alternative materials into account.

Phase numbers

From all items that have the same *phase number*, LN first plans the items that can be used as an alternative material, to determine the *ATP* of these items.

The phase number of a BOM component must equal the phase number of the component's alternative materials. If these phase numbers happen to be different, LN first tries to adjust the phase numbers to solve that problem. If the BOMs and alternative-material definition contains a cycle, a change of phase number cannot solve the problem and LN will display an error message.

If LN shows the **Alternatives Cycle detected.** error message, use the Remove Used Up Materials from Alternative Materials (tibom0252m000) session to remove the alternative material that causes the problem.

Example

The following situation is an example of an alternative cycle:

- Item A has phase number 0.
- B is a material in the BOM of A (B has phase number 1)
- C is a material in the BOM of B (C has phase number 2)
- A is an alternative for material C. (A must have the same phase number as C, but A has phase number 0)

Many other combinations can result in an alternative cycle.

Checks on the execution level

You can repeat the check later, after you transferred the orders to the *execution level*. In that case, LN will recheck the inventory levels and change the selection of materials if necessary.

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