

Material Reservation Mode

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Material Reservation Mode

Estimated time to read: 5 minutes

When you are working with BOMs, and their Scope is Durables, Materials, Packing, or Weigh And Dispense, you will have to define whether the BOM Products include Material Reservations, and how Material Reservations are handled for the BOM Items.

Material Reservation is the process of allocating specific quantities of raw materials, components, or subassemblies from inventory to a specific production or work order. This ensures that those Materials are not consumed by other orders and are available when production begins.

The Material Reservation Mode property has three options to select from:

- Material Dependency
- None (default)
- Production Order

This tutorial will show you how to can use the Material Reservation Mode property in relation to the Material Dependency and Production Order options.

For both Material Dependency and Production Order you must ensure that you have your Critical Manufacturing MES structure configured which will allow you to set up these modes.

For the example scenario below, you will need to create:

- Steps
- Flows
- Products
- Materials
- BOMs
- Resources
- Services

For the purpose of this tutorial all new entities, including the ones above, were created and can be uploaded via the following Master Data files:

- [Material Dependency](#)
- [Production Order](#)

The provided Master Data files will allow you to undertake the paths and instructions provided below.

For more information, see [Manage BOM Items](#).

Material Dependency

1. Create a **BOM** and set its Scope as Materials:

Create New BOM

CHANGE SET — GENERAL DATA

General Data

Name: AA-BOM-01

Revision: Name can be automatically generated or you can enter a name of your choice

Description: AA-BOM-01

* Type: General

Data Group:

Information

* Scope: Materials

Product: Product

* Base Quantity: 1

* Units: Unit

Drawing: Drag file to upload or Browse File

Comments:

Cancel < Back Create

2. Select the section **BOM Items** and then select **Manage**:

Manage BOM Items

BOM ITEMS — SUBSTITUTES

AA-BOM-01 [A,2] / AA-BOM-01

BOM Items

PRODUCT	QTY
AA-Prod-01 [A] (AA-Prod-01)	1 Unit
AA-Prod-01	

BOM Items Details

* Product: AA-Prod-01 [A]

Product Description: AA-Prod-01

* Quantity: 1

Units: Unit

Location:

Position:

Named Position:

* Source Step: AA-Step-Warehouse

Designator:

Assembly Step: AA-Step-Mixing

Comments:

Cancel < Back Next >

3. Be sure to enter the necessary information, and set the Material Reservation Mode property to Material Dependency:

Manage BOM Items

BOM ITEMS — SUBSTITUTES

AA-BOM-01 [A,Z] / AA-BOM-01

BOM Items

PRODUCT	QTY
AA-Prod-01 [A] (AA-Prod-01) AA-Prod-01	1 Unit

Source Step: AA-Step-Warehouse

Designator:

Assembly Step: AA-Step-Mixing

Logical Flow Path:

Browse

Reference:

Product Mix Allowed:

Material Reservation Mode: Material Dependency

Condition

Characteristic:

Value:

Comments:

Cancel < Back Next >

4. Define the **BOMContext** Smart Table by adding the **Step** when the **BOM** will be used, and the other necessary information:

+ Add BOM Context Record(s)

BOMContext (Active)

Record(s)

Record #1
Step: AA-Step-Mixing | BOM: AA-BOM-01 | AssemblyType: AutomaticAtTrackOut | TrackInCheckMode: None | Trac

BOM Context

Step: AA-Step-Mixing

Logical Flow Path:

Browse

Product: Product

Product Group: Product Group

Flow: Flow

Material: Material

Production Order: Production Order

BOM: AA-BOM-01

Assembly Type: Automatic At Track Out

Track-In Check Mode: None

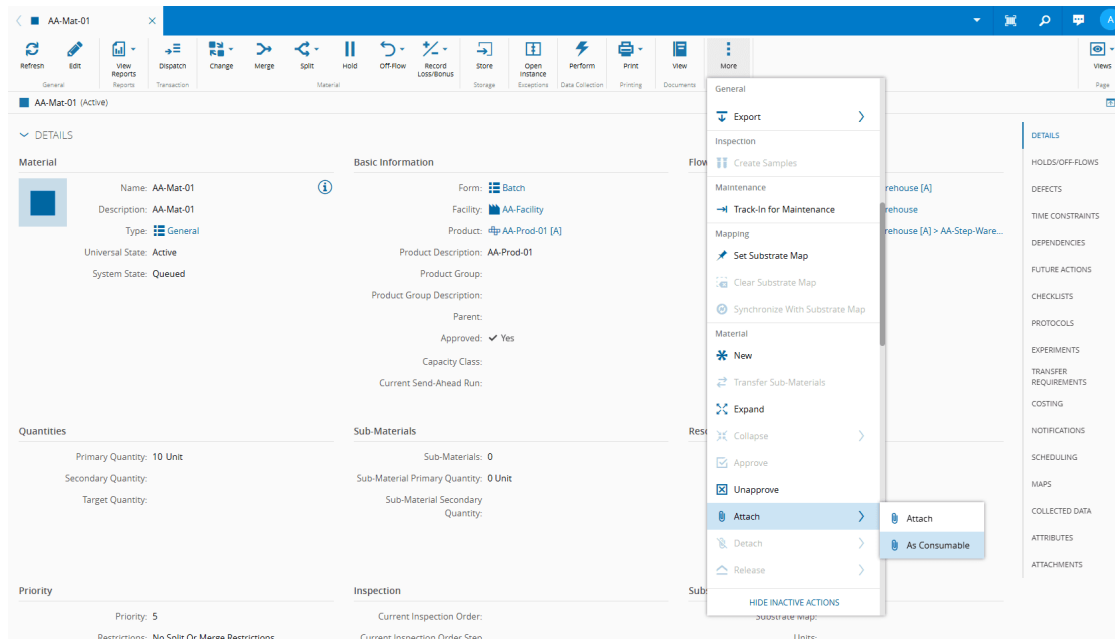
Track-Out Losses Mode: Before Assembly

Weigh And Dispense Mode:

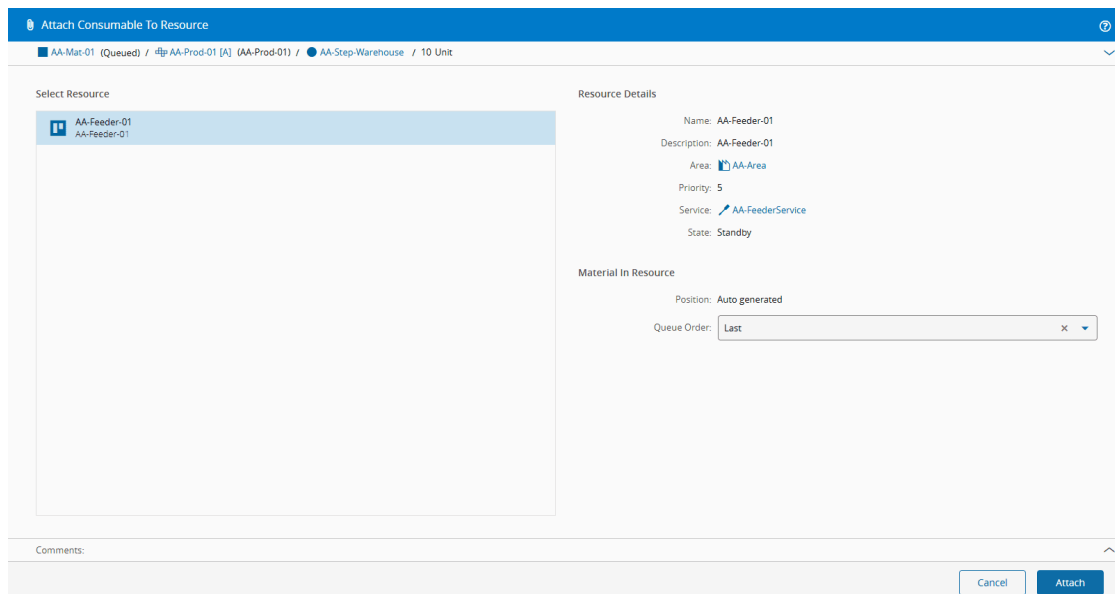
Comments:

Cancel Add

5. Attach your consumable **Material** as shown below:



6. Confirm the information and select **Attach**:



7. Go to the **Dependencies** section, select **Manage**, and select the **To** tab if you are creating the dependency from the main **Material** point of view:

Manage Material Dependencies

FROM
TO

AA-Mat-02 (Queued) / AA-Prod-02 [A] (AA-Prod-02) / AA-Step-Mixing / 10 Unit

Dependencies

AA-Mat-01

Material Dependency Details

* From Material: AA-Mat-01

* From Step: AA-Step-Mixing

From Flow Path: AA-Flow-Production [A]

Flow Path: AA-Flow-Production [A] > AA-Step-Mixing

To Material: AA-Mat-02

* To Step: AA-Step-Mixing

To Flow Path: AA-Flow-Production [A]

Flow Path: AA-Flow-Production [A] > AA-Step-Mixing

Comments:

Cancel
Update

8. Complete the necessary information and make sure the System State property is set to Closed:

Manage Material Dependencies

FROM
TO

AA-Mat-02 (Queued) / AA-Prod-02 [A] (AA-Prod-02) / AA-Step-Mixing / 10 Unit

Dependencies

AA-Mat-01

Material Dependency Details

* To Step: AA-Step-Mixing

To Flow Path: AA-Flow-Production [A]

Flow Path: AA-Flow-Production [A] > AA-Step-Mixing

From Quantity:

From Units: Units

To Quantity:

To Units: Units

System State: Closed

Comment:

Comments:

Cancel
Update

Note

If the System State property is set to Open, the system will return the following error when you try to Track-In:

Dispatch and Track-In Material

RESOURCE

BOM

RESULTS

AA-Mat-02 (Queued)

AA-Prod-02 [A] (AA-Prod-02)

AA-Step-Mixing / 10 Unit

The object AA-Mat-02 of type Material has dependencies on object AA-Mat-01 of type Material.

Comments:

Cancel

< Back

Next >

Track-In

9. You can now Dispatch and Track-In your main **Material** and verify the **BOM** information:

Dispatch and Track-In Material

RESOURCE

BOM

AA-Mat-02 (Queued)

AA-Prod-02 [A] (AA-Prod-02)

AA-Step-Mixing / 10 Unit

AA-BOM-01 [A] (AutomaticAtTrackOut) / Units: Unit

BOM

ITEM	LOCATION	POSITION	PRODUCT	PRODUCT DESCRIPTION	STEP	QUANTITY	REFERENCE	PRODUCT MIX	DISCRETE	REQUIRED QTY.	CURRENT QTY.	DELTA	
1			AA-Prod-01 [A]	AA-Prod-01	AA-Step-Warehous	1 Unit	X	X	X	10 Unit	10 Unit	0 Unit	1 >

Rows per Page: 25

Page 1 of 1 (1 Records)

Comments:

Cancel

< Back

Track-In

Dispatch and Track-In Material

RESOURCE — BOM

AA-Mat-02 (Queued) / AA-Prod-02 [A] (AA-Prod-02) / AA-Step-Mixing / 10 Unit

AA-BOM-01 [A] (AutomaticAtTrackOut) / Units: Unit

Consumable Feed: AA-Feeder-01

AA-Prod-01

MATERIAL	PRODUCT	STEP	PRIMARY QTY.	EXPIRATION DATE
AA-Mat-01	AA-Prod-01 [A]	AA-Step-Warehouse	10 Unit	

Rows per Page: 25 Page 1 of 1 (1 Records)

Comments:

Cancel
Back
Track-In

10. Select **Track-In**.

11. When you then select **Track-Out**, the whole **Material** will be consumed.

Warning

If you select Material Dependency for the Material Reservation Mode, but do not create a Dependency for the Material you want to produce, the system will return an error. In the example below, the AA-Mat-02 is the Material that is being produced, and it depends on AA-Mat-01 to provide it with its raw materials. As this Dependency was not created, the system will not allow you continue, and explains just that in the error message:

Track-Out Material

RESOURCE STATE — RESULTS

AA-Mat-02 (InProcess) / AA-Prod-02 [A] (AA-Prod-02) / AA-Step-Mixing / 10 Unit

There must be an active Material Dependency from Material 'AA-Mat-01' to the Material 'AA-Mat-02'.

Comments:

Cancel
Back
Next
Track-Out

Production Order

1. Create a **BOM** and set its Scope as Materials:

Create New BOM

CHANGE SET — GENERAL DATA

General Data

Name: AAA-BOM-01

Revision: Name can be automatically generated or you can enter a name of your choice

Description: AAA-BOM-01

* Type: General

Data Group:

Information

* Scope: Materials

Product: Product

* Base Quantity: 1

* Units: Unit

Drawing: [Drag files to upload](#) or [Browse Files](#)

Comments:

[Cancel](#) [< Back](#) [Create](#)

2. Select the section **BOM Items** and then select **Manage**:

Manage BOM Items

BOM ITEMS — SUBSTITUTES

AAA-BOM-01 [A.1] / AAA-BOM-01

BOM Items

PRODUCT	QTY
AAA-Prod-01 [A] (AAA-Prod-01)	1 Unit
No Position	

BOM Items Details

* Product: AAA-Prod-01 [A]

Product Description: AAA-Prod-01

* Quantity: 1

Units: Unit

Location:

Position:

Named Position:

* Source Step: AAA-Step-Warehouse

Designator:

Assembly Step: AAA-Step-Mixing

Comments:

[Cancel](#) [< Back](#) [Next >](#)

3. Be sure to enter the necessary information, and set the Material Reservation Mode property to Production Order:

Manage BOM Items

BOM ITEMS — SUBSTITUTES

AAA-BOM-01 [A.1] / AAA-BOM-01

PRODUCT	QTY
AAA-Prod-01 [A] (AAA-Prod-01)	1 Unit

Named Position:

* Source Step: AAA-Step-Warehouse

Designator:

Assembly Step: AAA-Step-Mixing

Logical Flow Path:

Reference: ☐

Product Mix Allowed: ☐

* Material Reservation Mode: Production Order

Condition

Characteristic:

Value:

Comments:

4. Define the **BOMContext** Smart Table by adding the **Step** when the **BOM** will be used, and the other necessary information:

+ Add BOM Context Record(s)

BOMContext (Active)

Record(s)	BOM Context
Record #1 Step: AAA-Step-Mixing BOM: AAA-BOM-01 AssemblyType: AutomaticAtTrackOut TrackInCheckMode: None Tr	* Step: AAA-Step-Mixing Logical Flow Path: Browse Product: Product Group: Flow: Material: Production Order: * BOM: AAA-BOM-01 * Assembly Type: Automatic At Track Out Track-In Check Mode: None Track-Out Losses Mode: Before Assembly Weigh And Dispense Mode:

Comments:

5. Create a **Production Order** with the **Product** to be produced and all the other necessary information:

Create Production Order

1 GENERAL DATA

General Data

Name:

AAA-ProductionOrder

Description:

AAA-ProductionOrder

* Type:

General

x

System State:

Created

Data Group:

* System State:

Created

x

Information

* Order Number:

1

Order Line:

Owner Role:

Customer:

Business Partner

Facility:

Facility

* Product:

AAA-Prod-021A

x

Comments:

Cancel

Create

Create Production Order

GENERAL DATA

* Product:

* Flow Path: ☒ AAA-Step-Mixing

Flow Path: AAA-Flow-Production [A] > AAA-Step-Mixing

* Quantity:

* Units:

* Under Delivery Tolerance (%): Minimum Quantity: 10

* Over Delivery Tolerance (%): Maximum Quantity: 10

Product Yield (%): 100

Yield Adjusted Quantity: 10

Scheduling

* Due Date:

* Priority:

Planned Start Date:

Comments:

6. On the top ribbon of your **Production Order**, select **Release**:

AAA-ProductionOrder

Refresh Edit Release Start Restrict Cancel Assign Reassign Create Material More

General Release Production Order Material Actions

AAA-ProductionOrder (Active)

DETAILS

Production Order

Name: AAA-ProductionOrder
Description: AAA-ProductionOrder
Type: General
Universal State: Active
System State: Created

Quantities

In Progress
Completed
Delivered

Quantity: 10 Unit
Minimum Quantity: 10 Unit
Maximum Quantity: 10 Unit
In Progress: 0 Unit
Completed: 0 Unit
Delivered: 0 Unit

Information

Order Number: 1
Order Line:
Owner Role:
Customer:
Product: AAA-Prod-02 [A]
Facility:
Row: AAA-Flow-Production [A]
Step: AAA-Step-Mixing
Product Yield: 100 %
Yield Adjusted Quantity: 10 Unit
Under Delivery Tolerance: 0 %
Over Delivery Tolerance: 0 %

Scheduling

Due Date: 06/30/2025 04:31 PM
Planned Start Date: 07/02/2025 03:07 PM
Planned End Date: 07/10/2025 03:07 PM
Priority: 5
Standard Cycle Time: 0 days(s)
Cycle Time Buffer: 8 days(s)
Include In Planning: Yes

Options

Validate Material Products: No
Restrict Order on Completion: Yes
Restricted: No

Notifications

Notify List on State Changes: No
Notification Date:
Distribution List:

7. Enter the needed dates and select **Release**:

Release Production Order

AAA-ProductionOrder (Created) / AAA-Prod-02 [A] / 10 Unit

Scheduling

* Planned Start Date: 07/02/2025 03:07 PM

* Planned End Date: 07/10/2025 03:07 PM

Comments:

Cancel Release

8. In the **Production Order**, select the **Materials** section followed but the **Assign** button on the top ribbon to assign your main **Material**:

Assign Materials to Production Order

AAA-ProductionOrder (Released) / AAA-Prod-02 [A] / 10 Unit

Materials to Assign

- AAA-Mat-02 (in progress)
- 10 Unit / ProductAAA-Prod-02

Material details

* Material: AAA-Mat-02

State: Queued

Product: AAA-Prod-02 [A]

Step: AAA-Step-Mixing

Quantity: 10 Unit

Type: General

Facility: AAA-Facility

Flow: AAA-Flow-Production [A]

Comments:

Cancel Assign

9. Select **Assign** and your **Production Order** will have the main **Material** assigned to it:

AAA-ProductionOrder

PRODUCTION ORDER STEPS

MATERIALS

ACTIVE ACCOUNTS TO Search

MATERIAL	ACTIVE	ACCOUNTS TO	STATUS	PRODUCT	PRODUCT DESCRIPTION	QUANTITY	UNITS	FACILITY	STEP
AAA-Mat-02	✓	✓	In Progress	AAA-Prod-02 [A]	AAA-Prod-02	10	Unit	AAA-Facility	AAA-Step-Mixing

Rows per Page: 25 Page 1 of 1 (1 Records)

10. Now, attach your consumable **Material** as shown below:

AAA-Mat-01

DETAILS

Material

Name: AAA-Mat-01

Description: AAA-Mat-01

Type: General

Universal State: Active

System State: Queued

Form: Batch

Facility: AAA-Facility

Product: AAA-Prod-01 [A]

Product Description: AAA-Prod-01

Product Group:

Product Group Description:

Parent:

Approved: ✓ Yes

Capacity Class:

Current Send-Ahead Run:

Primary Quantity: 10 Unit

Secondary Quantity:

Target Quantity:

Sub-Materials

Sub-Materials: 0

Sub-Material Primary Quantity: 0 Unit

Sub-Material Secondary Quantity:

Priority

Priority: 5

Restrictions: No Split Or Merge Restrictions

Current Inspection Order:

Current Inspection Order Steo

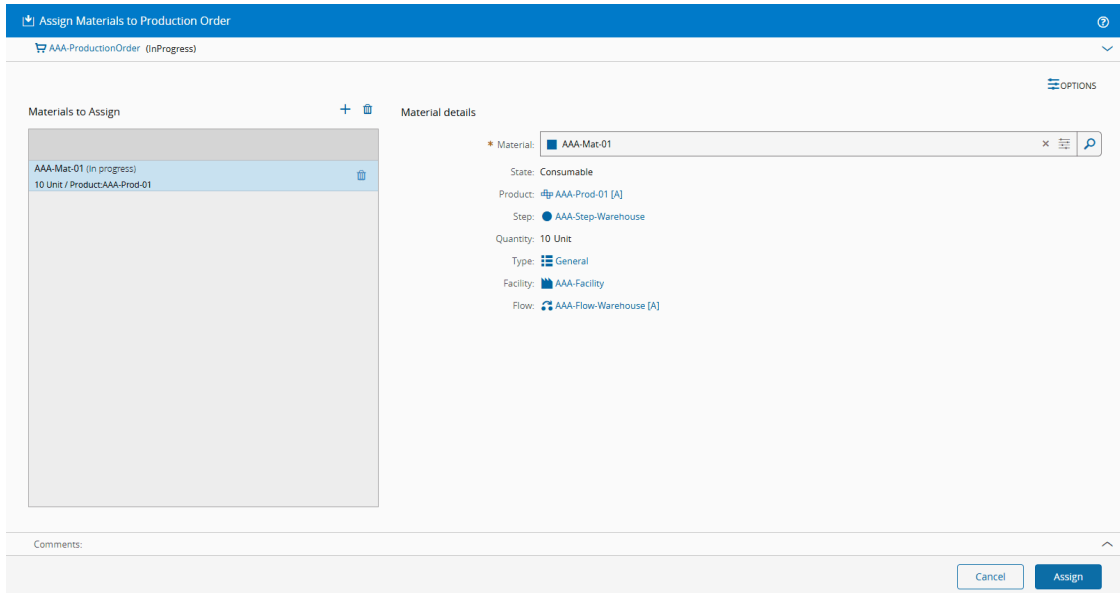
Attach

As Consumable

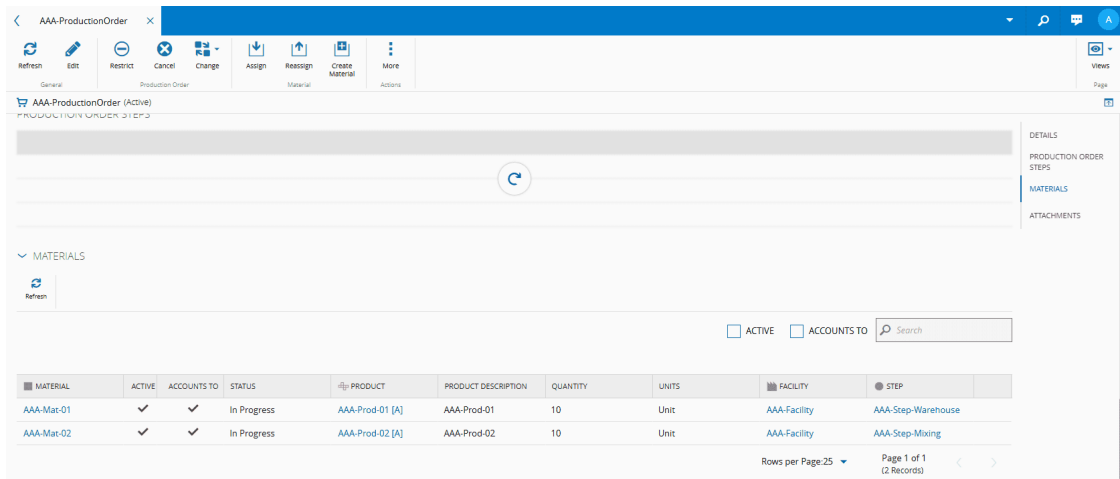
Note

This step is only needed because in this example we set the assembly Type of the BOM as Automatic at Track Out.

- Next, in the **Production Order**, you will need to assign the consumption **Material** and then select **Assign**:



- At this point, you can see your consumption **Material** and production information in the **Materials** section of your **Production Order**:



MATERIAL	ACTIVE	ACCOUNTS TO	STATUS	PRODUCT	PRODUCT DESCRIPTION	QUANTITY	UNITS	FACILITY	STEP
AAA-Mat-01	✓	✓	In Progress	AAA-Prod-01 [A]	AAA-Prod-01	10	Unit	AAA-Facility	AAA-Step-Warehouse
AAA-Mat-02	✓	✓	In Progress	AAA-Prod-02 [A]	AAA-Prod-02	10	Unit	AAA-Facility	AAA-Step-Mixing

- You can now Dispatch and Track-In your main **Material** and verify the BOM information:

Dispatch and Track-In Material

RESOURCE — BOM

AAA-Mat-02 (Queued) / AAA-Prod-02 [A] (AAA-Prod-02) / AAA-Step-Mixing / 10 Unit

AAA-BOM-01 [A] (AutomaticAtTrackOut) / Units: Unit

BOM

ITEM	LOCATION	POSITION	PRODUCT	PRODUCT DESCRIPTION	STEP	QUANTITY	REFERENCE	PRODUCT MIX	DISCRETE	REQUIRED QTY.	CURRENT QTY.	DELTA
1			AAA-Prod-01 [A]	AAA-Prod-01	AAA-Step-Warehouse	1 Unit	✗	✗	✗	10 Unit	10 Unit	0 Unit

Rows per Page: 25 Page 1 of 1 (1 Records)

Comments:

Cancel < Back Track-In

Dispatch and Track-In Material

RESOURCE — BOM

AAA-Mat-02 (Queued) / AAA-Prod-02 [A] (AAA-Prod-02) / AAA-Step-Mixing / 10 Unit

AAA-BOM-01 [A] (AutomaticAtTrackOut) / Units: Unit

Consumable Feed: AAA-Feeder-01

< AAA-Prod-01

MATERIAL	PRODUCT	STEP	PRIMARY QTY.	EXPIRATION DATE
AAA-Mat-01	AAA-Prod-01 [A]	AAA-Step-Warehouse	10 Unit	

Rows per Page: 25 Page 1 of 1 (1 Records)

Comments:

Cancel < Back Track-In

14. Select **Track-In**.

15. When you then select **Track-Out**, the whole **Material** will be consumed, as can be seen in the **Production Order**:

AAA-ProductionOrder

Refresh Edit Restrict Cancel Change Assign Reassign Create Material More

General Production Order Material Actions

PRODUCTION ORDER STEPS

DETAILS PRODUCTION ORDER STEPS MATERIALS ATTACHMENTS

MATERIALS

Refresh

☐ ACTIVE ☐ ACCOUNTS TO Search

MATERIAL	ACTIVE	ACCOUNTS TO	STATUS	PRODUCT	PRODUCT DESCRIPTION	QUANTITY	UNITS	FACILITY	STEP
AAA-Mat-02	✓	✓	In Progress	AAA-Prod-02 [A]	AAA-Prod-02	10	Unit	AAA-Facility	AAA-Step-Mixing

Rows per Page: 25 Page 1 of 1 (1 Records)

Warning

If the consumable Material is not assigned to the Production Order, the system will return an error. This error is due to the dependency that is defined in the BOM which is used in the Production Order:

Track-Out Material

RESOURCE STATE RESULTS

AAA-Mat-02 (InProcess) / AAA-Prod-02 [A] (AAA-Prod-02) / AAA-Step-Mixing / 10 Unit

There was no Material of Product AAA-Prod-01 found in the Consumable Feeds of Resource AAA-Mixer-01

Comments:

Cancel

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Next >

Track-Out



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