



Setup and Line Clearance

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Setup and Line Clearance

The Setup and Line Clearance feature supports the configuration and execution of **Resource** preparation between **Material** processing. It ensures that **Resources** are correctly prepared and verified before **Material** production, reducing errors like contamination or mix-ups.

Info

- No special licenses are required to use this functionality.
- This feature is part one of a two-part process that pairs seamlessly with the Line Verification feature. Check out the [Line Verification](#) tutorial.

Overview

In this tutorial, we will explore expand the following sections:

- Feature Overview – explaining how Setup and Line Clearance is envisioned to be used
- Scenario – presenting a simplified example to understand the logic
- Configuration – showing a step-by-step guide with screenshots and links to key documentation
- Execution – using the feature to run the setup and see it in action (video included)
- Final Notes – pointing out some additional insights and considerations

Feature

Line clearance ensures that all equipment and workspaces are clean and free from leftover materials or documentation from previous jobs. It is a way to help get the **Resource** ready for the next job while avoiding mistakes like mixing up labels or contaminating the final **Products**.

This process happens before the track-in of a **Material**, and it is commonly required in two typical use cases:

- Always: Setup is required every time a new **Material** is tracked in.
- On Change Over: Setup is only required when specific characteristic of the **Material** processing context changes (for example: **Product**, **Product Group**, **Service**, etc.).

Scenario

To assess how this industry and production requirement is addressed by Critical Manufacturing [MES](#), let's consider a simplified model:

- **Facility:** General Facility
- **Area:** Area 1
- **Flow and Steps:** General Flow with Step 1 and Step 2
- **Products and Product Group:** Product A, belonging to Product Group 1; and Product B belonging to Product Group 2
- **Resources and Services:** Resource 1 - providing Service A.1 and Service B.1; and Resource 2 - providing Service 2



Regarding Step 1:

- Product A requires Service A.1
- Product B requires Service B.1
- If the incoming **Material** requires a different **Service** than the previous one, setup is required, containing:
 - A **Checklist**
 - A **Data Collection**

Regarding Step 2:

- All **Materials** require Service 2
- Setup is always required before starting production, containing:
 - A **Checklist**
- If the incoming **Material** belongs to a different **Product Group** than the previous one, a different checklist must be used.

Configuration

Basic entities like **Calendar**, **Facility**, **Area**, **Services**, **Product Groups**, **Products** and **Parameters** won't be detailed.

Useful Documentation



There are four entities whose configurations require closer attention: **Steps**, **Resources**, **Checklists**, and **Data Collections**.

Resource Configuration

For Resource 1, setup needs to occur when the **Material** to be processed requires a different **Service** as the previous one.

The following properties must be configured:

- **Setup Mode** : On ChangeOver.
- **Use Different Setup Operations** : False (default).
- **Setup Begin and Complete Mode** : Manual Begin and Complete.

Resource 2 must always go through the setup process, regardless of the **Material** or any related details. However, it's still necessary to evaluate which setup is required based on the changeover characteristic of the **Step**.

The following properties must be configured:

- **Setup Mode** : Always.
- **Use Different Setup Operations** : True.

This property is enabled when the **Resource** supports multiple setup types, such as one required during a changeover and another when no changeover is involved.

- **Setup Begin and Complete Mode** : Manual Begin and Complete.

The following images display the general configuration settings of the **Resources**:

Resource 1 (Active)

Material Tracking

- Is Multi-Lane Active: No
- Lane Count: 0
- Lane Recipe Mode: Yes
- Allow Product Mix: Yes
- Enable Sub-Material Tracking: No
- Restrict to Form:
- Material Sort Rule Set:
- Dispatch List Maximum Size:
 - Unlimited Maximum Yes
 - Concurrent Materials in Process:
- Recipe Management Enabled: No
- Verify Material Recipe at Track-In: Yes
- Verify BOM at Track-In: Yes
- Can Process in Non-Working Time:

Material Logistics

- Has Storage Bins: No
- Picking Place: No
- Transport Service:
- Floor Life Safe:
- Start Floor Life Counter On Retrieve:
- Enable Automatic Replenishment: No
- Replenishment Mode:
 - Automatic Replenishment
 - Transfer Requirement Type:
- Periodic Inventory Locked: No
- Last Periodic Inventory Date:

Setup

- In Setup: No
- Setup Mode: On Changeover
- Setup Begin and Complete Mode: Manual Begin and Complete
- Current Setup:
- Current Setup Type:
- Current Material:
- Current Step:
- Current Flow Path:
- Current Running Mode:
- Current Lane:
- Current Checklist Instance:
- Current Data Collection Instance:

Resource 2 Configuration

Resource 2 (Active)

Material Tracking

- Is Multi-Lane Active: No
- Lane Count: 0
- Lane Recipe Mode:
- Allow Product Mix: Yes
- Enable Sub-Material Tracking: No
- Restrict to Form:
- Material Sort Rule Set:
- Dispatch List Maximum Size:
 - Unlimited Maximum Yes
 - Concurrent Materials in Process:
- Recipe Management Enabled: No
- Verify Material Recipe at Track-In: Yes
- Verify BOM at Track-In: Yes
- Can Process in Non-Working Time:

Material Logistics

- Has Storage Bins: No
- Picking Place: No
- Transport Service:
- Floor Life Safe:
- Start Floor Life Counter On Retrieve:
- Enable Automatic Replenishment: No
- Replenishment Mode:
 - Automatic Replenishment
 - Transfer Requirement Type:
- Periodic Inventory Locked: No
- Last Periodic Inventory Date:

Setup

- In Setup: No
- Setup Mode: Always
- Use Different Setup Yes
- Operations:
- Setup Begin and Complete Mode: Manual Begin and Complete
- Current Setup:
- Current Setup Type:
- Current Material:
- Current Step:
- Current Flow Path:
- Current Running Mode:
- Current Lane:
- Current Checklist Instance:
- Current Data Collection Instance:

Useful Documentation

- [Create Resource](#)
- [How to: Create a Resource](#)

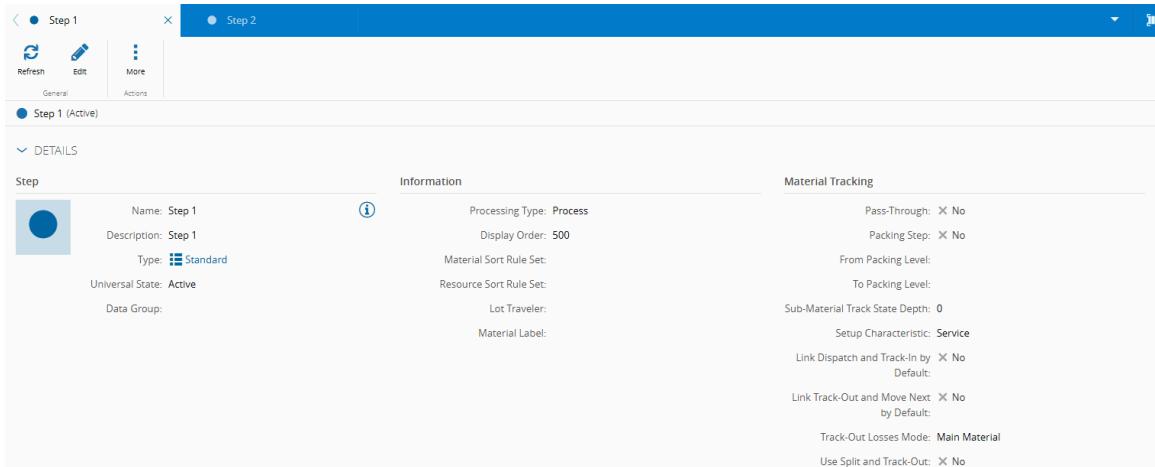
Step Configuration

The **Step** configuration defines which characteristic should be evaluated when determining whether a changeover is required.

For Step 1, the setup is required if the **Material** being tracked requires a different **Service** than the previous one, and for this reason the **Setup Characteristic** property must be set to "Service".

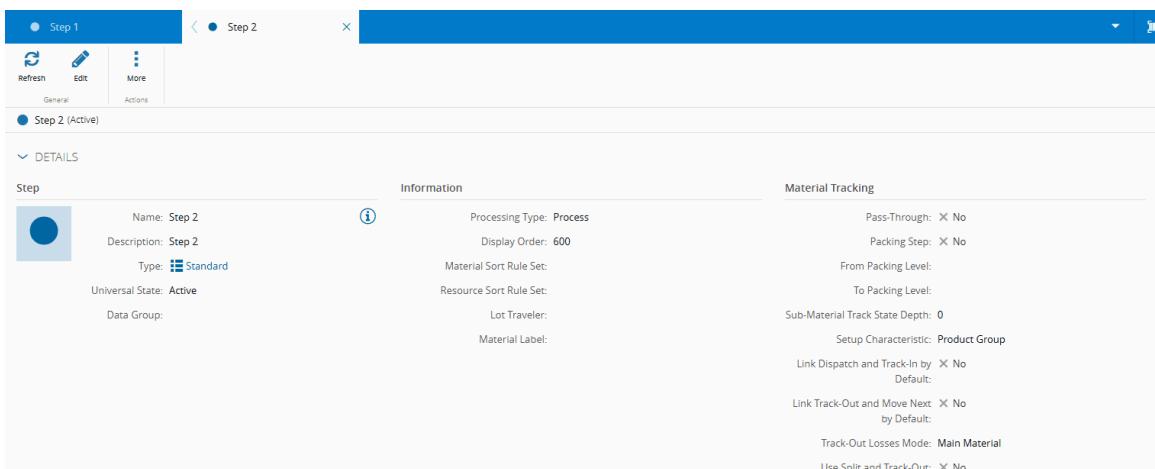
For Step 2, a setup considering change over is required if the **Material** being tracked in has a different **Product Group** than the previous one, and for this reason the `Setup Characteristic` property must be set to "Product Group".

Step 1 Configuration



The screenshot shows the configuration of Step 1. The top navigation bar has tabs for Step 1 and Step 2, with Step 1 selected. The left sidebar shows "Step 1 (Active)". The main area is divided into three sections: Step, Information, and Material Tracking. The Step section shows a blue circular icon, Name: Step 1, Description: Step 1, Type: Standard, Universal State: Active, and Data Group: (empty). The Information section shows Processing Type: Process, Display Order: 500, Material Sort Rule Set: (empty), Resource Sort Rule Set: (empty), Lot Traveler: (empty), and Material Label: (empty). The Material Tracking section shows Pass-Through: No, Packing Step: No, From Packing Level: (empty), To Packing Level: (empty), Sub-Material Track State Depth: 0, Setup Characteristic: Service, Link Dispatch and Track-In by: No, Default: (empty), Link Track-Out and Move Next: No, by Default: (empty), Track-Out Losses Mode: Main Material, and Use Split and Track-Out: No.

Step 2 Configuration



The screenshot shows the configuration of Step 2. The top navigation bar has tabs for Step 1 and Step 2, with Step 2 selected. The left sidebar shows "Step 2 (Active)". The main area is divided into three sections: Step, Information, and Material Tracking. The Step section shows a blue circular icon, Name: Step 2, Description: Step 2, Type: Standard, Universal State: Active, and Data Group: (empty). The Information section shows Processing Type: Process, Display Order: 600, Material Sort Rule Set: (empty), Resource Sort Rule Set: (empty), Lot Traveler: (empty), and Material Label: (empty). The Material Tracking section shows Pass-Through: No, Packing Step: No, From Packing Level: (empty), To Packing Level: (empty), Sub-Material Track State Depth: 0, Setup Characteristic: Product Group, Link Dispatch and Track-In by: No, Default: (empty), Link Track-Out and Move Next: No, by Default: (empty), Track-Out Losses Mode: Main Material, and Use Split and Track-Out: No.

Useful Documentation

- [Create Step](#)
- [How to: Create a Step](#)

Checklist

As for the **Checklists** involved in the setup process, they must be configured to be executed in a Long Running mode. Below is an image showing the general configuration of three different **Checklists**.

Checklist Setup 1 ChangeOver



Setup 1 ChangeOver [A.1] Setup 2 [A.2] Setup 2 ChangeOver [A.1]

New Refresh Edit Lock Preview Open For Instances More

General Actions

Setup 1 ChangeOver [A.1] A (Default) 1 (Effective)

DETAILS

Checklist

Name: Setup 1 ChangeOver

Description:

Type: Standard

Universal State: Effective

Data Group:

Information

Scope: MaterialTracking

Execution Mode: Long Running

BOM:

Product:

Data Collection:

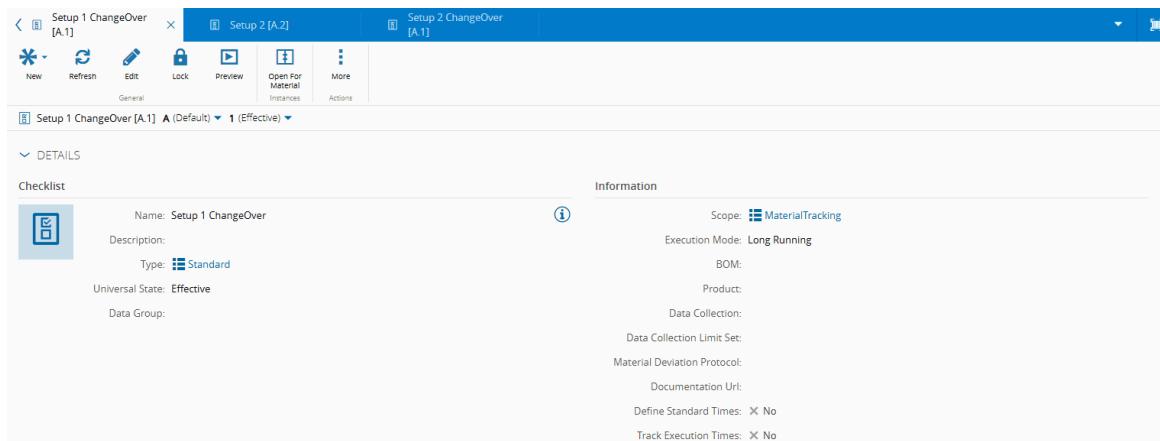
Data Collection Limit Set:

Material Deviation Protocol:

Documentation Url:

Define Standard Times: No

Track Execution Times: No



Checklist Setup 2

Setup 1 ChangeOver [A.1] Setup 2 [A.2] Setup 2 ChangeOver [A.1]

New Refresh Edit Lock Preview Open For Instances More

General Actions

Setup 2 [A.2] A (Default) 2 (Effective)

DETAILS

Checklist

Name: Setup 2

Description:

Type: Standard

Universal State: Effective

Data Group:

Information

Scope: MaterialTracking

Execution Mode: Long Running

BOM:

Product:

Data Collection:

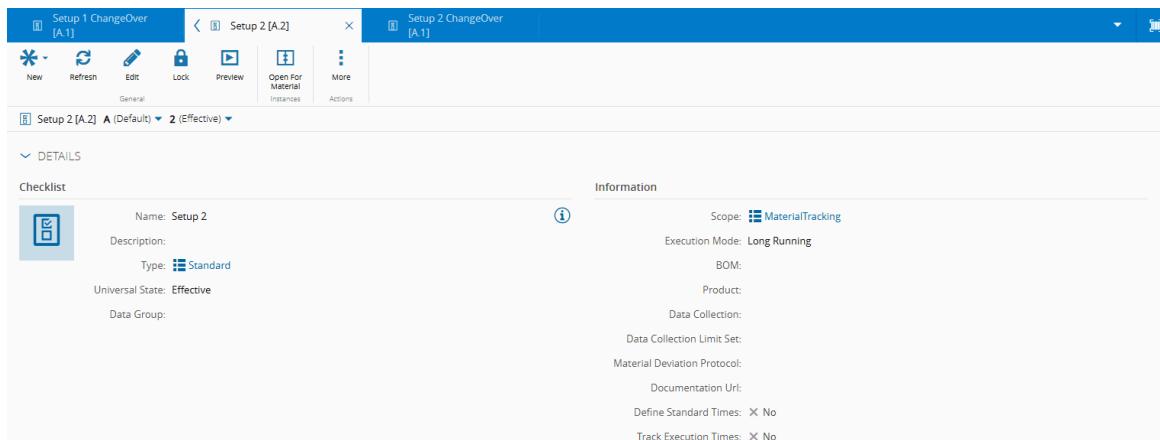
Data Collection Limit Set:

Material Deviation Protocol:

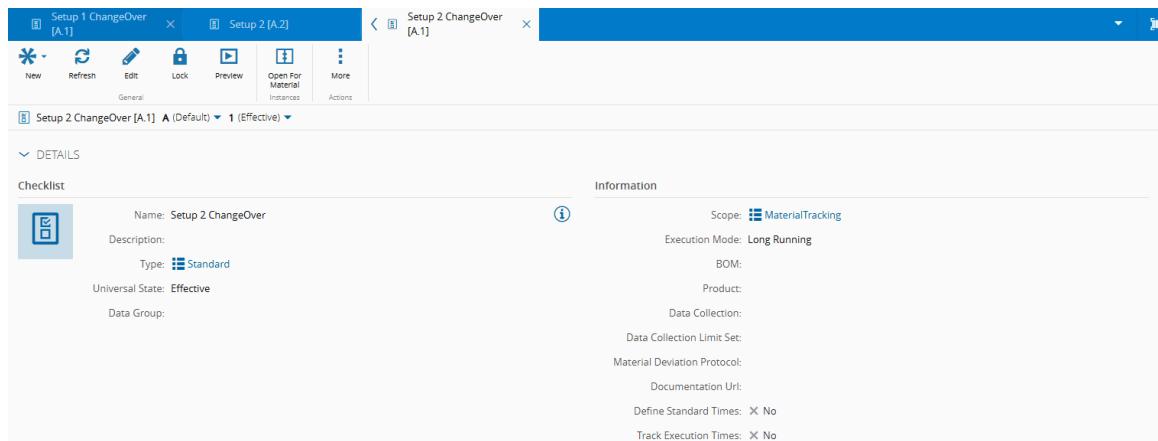
Documentation Url:

Define Standard Times: No

Track Execution Times: No



Checklist Setup 2 ChangeOver



The screenshot shows a software interface with a top navigation bar containing three tabs: 'Setup 1 ChangeOver [A.1]', 'Setup 2 [A.2]', and 'Setup 2 ChangeOver [A.1]'. Below the tabs is a toolbar with icons for 'New', 'Refresh', 'Edit', 'Lock', 'Preview', 'Open For Material Instances', and 'More'. The main content area is titled 'DETAILS' and contains two sections: 'Checklist' and 'Information'. The 'Checklist' section shows the name 'Setup 2 ChangeOver', type 'Standard', and status 'Effective'. The 'Information' section includes fields for Scope (MaterialTracking), Execution Mode (Long Running), BOM, Product, Data Collection, Data Collection Limit Set, Material Deviation Protocol, Documentation Url, Define Standard Times (checked), and Track Execution Times (checked).

When configuring the Smart Table [MaterialChecklistContext](#), it's important to account for two possible scenarios in Step 2:

- A new **Material** is processed and belongs to a different **Product Group** than the previous one, triggering a changeover and requiring a specific **Checklist**.
- A new **Material** is processed and belongs to the same **Product Group** as the previous one, requiring a different **Checklist**, but not considered a changeover.

Step	Operation	Checklist
Step 1	Perform Setup	Setup 1 ChangeOver
Step 2	Perform Setup	Setup 2 ChangeOver
Step 2	Perform Setup No Change Over	Setup 2

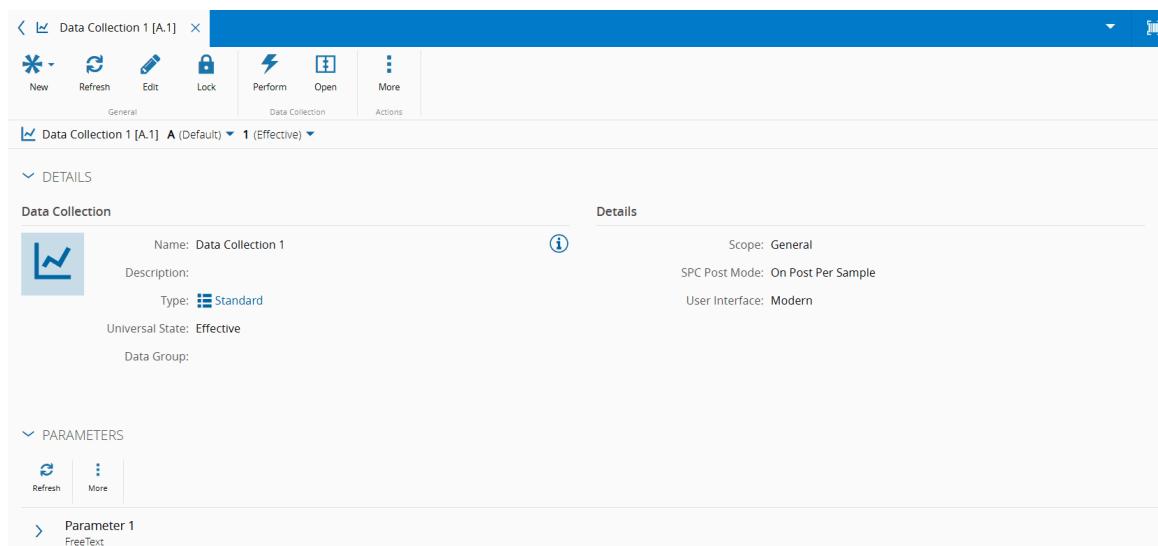
Useful Documentation

- [Create Checklist](#)
- [How to: Create a Checklist](#)
- [MaterialChecklistContext](#)
- [How to: Add Value to Smart Table](#)

Data Collection

Similar to the **Checklist**, the **Data Collection** must be configured to be executed in a Long Running mode. Below is an image showing the general configuration of the **Data Collection**:

Data Collection Step 1 Configuration



The Smart Table configuration for `MaterialDataContext` should be as follows:

Step	Operation	Data Collection	Data Collection Type
Step 1	Perform Setup	Data Collection 1	Long Running

Useful Documentation

- [Create Data Collection](#)
- [How to: Create a Data Collection](#)
- [MaterialDataContext](#)
- [How to: Add Value to Smart Table](#)

This is the [Master Data file](#) used to create this model.

Execution

In this section, we will explore the **Perform Setup** and **Perform Pre-Setup** operations. The key difference between them is:

- **Perform Setup** prepares the **Resource** for a **Material** that is about to be processed.
- **Perform Pre-Setup** prepares the **Resource** in advance for a **Material** that is not yet at the **Step** where the **Resource** will be used.

To test and execute this functionality, we will follow a detailed use case, outlined step by step and demonstrated in the video below.

Assumptions





Resource and Step 1

The system will prevent processing any **Material** unless the required setup is completed.

In the Resource 1 view:

- Select a **Material** with **Product** "Product A" and choose Perform Setup, completing the setup **Checklist** and the required **Data Collection**.
- Track-in and process the **Material** with **Product** "Product A".
- Process a second **Material** with **Product** "Product A" — this should proceed without a new setup, as it uses the same **Service**.
- Attempt to process a **Material** with **Product** "Product B" — this should fail, as the setup for Product B hasn't been completed yet.
- Select the **Material** with **Product** "Product B" and again choose Perform Setup, completing the **Checklist** and **Data Collection** as required.
- Track-in and process the **Material** with **Product** "Product B".
- Process the second **Material** with **Product** "Product B".

Resource and Step 2

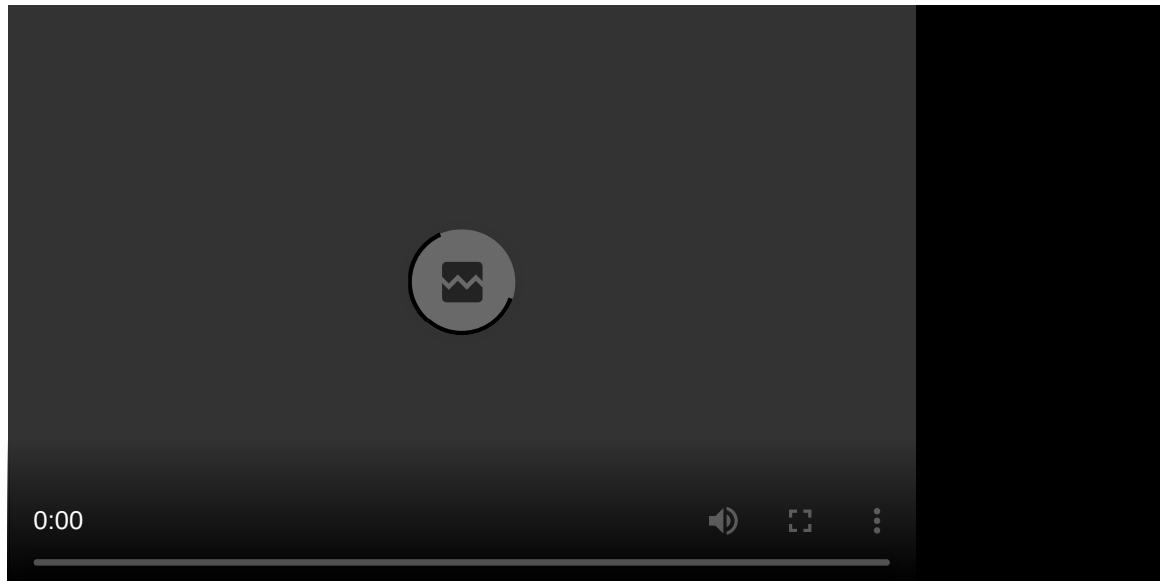
The system will prevent processing any **Material** unless the required setup is completed.

In the Resource 2 view:

- To explore another option, select Perform Pre-Setup from the top ribbon and choose a **Material** with **Product** "Product A" that is still in Step 1. This action should trigger the Setup 2 Changeover, preparing the **Resource** in advance.
- Since Resource 2 always requires a setup, when the **Material** reaches Step 2 and is ready to be processed, a new setup must be performed, this time triggering the Setup 2 **Checklist**.
- Move the Materials from Step 1 to Step 2.
- Perform Setup again for the **Material** with **Product** "Product A".
- Track-in and process the **Material** with **Product** "Product A".
- Attempt to process another **Material** (either Product A or B) this should require a new setup.
- Select a **Material** with **Product** "Product A" and Perform Setup. Since this is not a changeover, the system should trigger only the Setup 2 **Checklist**.
- Perform Setup for the **Material** with **Product** "Product B". As this is a **Product Group** changeover, the system should trigger the Setup 2 Changeover **Checklist**.
- Track-in and process the **Material** with **Product** "Product B".

Useful Documentation

- Perform Setup
- Perform Pre Setup



Final Considerations

The Setup and Line Clearance functionality is triggered and overrides the previous setup feature when the **Resource** Setup Mode is set to anything other than "Not Required" and a **Setup Characteristic** is defined on the **Step**.

Otherwise, the system will fall back to the legacy setup behavior, which requires **Data Collections** and **Checklists** to be configured as Immediate.



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