



**Critical**  
manufacturing  
an ASM PT company

# Partial Track-Out

10.2

March 2024

## DOCUMENT ACCESS

Public

## DISCLAIMER

The contents of this document are under copyright of Critical Manufacturing S.A. it is released on condition that it shall not be copied in whole, in part or otherwise reproduced (whether by photographic, or any other method) and the contents therefore shall not be divulged to any person other than that of the addressee (save to other authorized offices of his organization having need to know such contents, for the purpose for which disclosure is made) without prior written consent of submitting company.

# Partial Track-Out

*Estimated time to read: 8 minutes*

**Partial Track-Out** is an operation that relates to **Material**, which is one of the most important objects in the system as it represents any raw material, inventory or work-in-progress (wafers, dies, modules, printed circuit boards, capacitors, etc.).

A **Material** is partially tracked out when only a certain amount of the original **Material** is required to be processed. This is quite common with large production orders that need to be broken down into smaller quantities and use the **Partial Track-Out** operation to split and track out materials for a more continuous processing.

This document will guide you through the setup of a **Partial Track-Out** scenario.

## Overview

A **Partial Track-Out** happens when a **Material** is tracked in at a **Resource** in a **Step** and only a fraction of the quantity should be tracked out to a new **Material**.

### Note

The original **Material** stays tracked in at the same **Resource** with the remaining quantity.

### Info

The **Step** must be configured to allow partial track-outs.

## Scenario Setup

To enable partial track-outs, follow the steps described in the table below:

Step Number	Step	Description
1	Create context resolution entry	Create the entry in the <a href="#">StepSplitTrackOutContext</a> smart table for context definition.
2	Enable Step for Partial Track-Out	Set the <b>Use Split and Track-Out</b> property in the <b>Step</b> to allow partial track-outs.

Table: Steps to setup the Partial Track-Out related Entities

After the setup of these entities is performed, you can process a **Material** and perform a Partial Track-Out at the configured **Step**. The steps below will help you to create the adequate scenario:

### Step 1: Create context resolution entry

You have to configure the system to allow partial track-outs at a specific context. The [StepSplitTrackOutContext](#) smart table provides a wide range of possibilities, and these allow you to define a different set of contexts to perform partial track-outs (depending on the needs of your process). You can define the following different contexts:

Field	Description
<b>Step</b>	On which <b>Step</b> will partial track-out be enabled.
<b>Product</b>	On which <b>Product</b> will partial track-out be enabled.
<b>Product Group</b>	On which <b>Product Group</b> will partial track-out be enabled.
<b>Flow</b>	On which <b>Flow</b> will partial track-out be enabled (applies to the immediate parent <b>Flow</b> of the <b>Step</b> where the <b>Material</b> is currently, and not to the Top Level <b>Flow</b> ).
<b>Resource</b>	On which <b>Resource</b> will partial track-out be enabled.
Resource type	On which <b>Resource</b> Type will partial track-out be enabled.
Model	On which <b>Resource</b> Model will partial track-out be enabled.

Table: StepSplitTrackOutContext Smart Table keys

This means you can define that partial track-outs can take place for a specific **Step** in a variety of possible combined contexts, depending on the resolution, and precedence key, which you define in the smart table. For more information on context resolution, see [Smart Tables](#).

For each of these possible context definitions, you have to define three values that will be applied if the context is resolved:

Field	Description
<b>Enable Quantity Override</b>	Whether the default quantity can be overridden.
<b>Track-Out Material Mode</b>	Whether the <b>Material</b> to be tracked-out is the Parent Material or the Child. Possible options: - <code>Child</code> - the Child is tracked-out and a split is required for the last <b>Material</b> . - <code>ChildExceptLast</code> - The Child <b>Material</b> is tracked-out except for the last <b>Material</b> , where no split is required and the Parent <b>Material</b> will be tracked-out instead.
<b>Material Losses Mode</b>	Whether losses are incurred on the <b>Material</b> that is tracked-out or the one that stays. Possible options: - <code>InProcessMaterialExceptLast</code> - <code>TrackedOutMaterial</code>

Table: StepSplitTrackOutContext Smart Table values

As a quick example, the configuration below defines that a Split and Track-Out operation can happen at the `Mixing` **Step** and the `Mixer-05` **Resource**, with the following characteristics:

- A Child **Material** will be created with Primary Quantity = 10 units. This value can be overridden due to the Enable Quantity Override property being set to true).
- The original **Material**, now Parent to the split Child **Material**, will remain in state In Process, with 10 units removed from the original Primary Quantity.
- The **Material** that will be tracked-out will be the Child **Material** of the main **Material**, and any losses will be incurred by the original **Material**.



STEP	PRODUCT	PRODUCT GROUP	FLOW	RESOURCE	RESOURCE TYPE	MODEL	DEFAULT QUANTITY	ENABLE QUANTITY OVER	TRACK-OUT MATERIAL	MATERIAL LOSSES MODE
Mixing				Mixer-05			10	✓	Child Except Last	In Process Material Except Last

## Step 2: Enable Step for Partial Track-Out

A vital property must be enabled in the **Step** to allow partial track-outs:

Property	Description
<b>Use Split and Track-Out</b>	Whether partial track-outs (also known as Split and Track-Out in Critical Manufacturing MES) will be used at the <b>Step</b> .

Table: Step relevant property

Mixing		Information		Material Tracking	
<b>Step</b>  Name: Mixing Description: Mixing Step Type: Process Universal State: Active		Processing Type: Process Display Order: 18 Material Sort Rule Set: Resource Sort Rule Set: Resource Queue Size Lot Traveler: Material Label:	Pass-Through: X No Sub-Material Track State: 0 Depth: Link Dispatch and Track-in by: ✓ Yes Default: Link Track-Out and Move Next: X No by Default: Track-Out Losses Mode: Main Material <b>Use Split and Track-Out: ✓ Yes</b>	DETAILS LOGICAL NAMES AREAS REASONS FUTURE ACTIONS COSTING SAMPLING INSPECTIONS	Views Page

## Scenario example

Consider a **Material** MAT\_0003 currently queued at the **Mixing Step**:

Mixing

Refresh Dispatch and Track-Transaction Change Split Hold Off-Flow Record Loss/Bonus Attach Grade Material Create Sub-Products Store Reset Data Collection Perform Post Data Print View Reports Add Request View More Views Layout

STEP

Materials 11

Resources

STATE: ALL PRODUCT: Belgas [A] X FLOW: Flow Material Name

1 Item Selected

	MATERIAL	QTY	UNITS	PRODUCT	FLOW	STEP	PRIORITY	STATE	IN OFF-FLOW
<input type="checkbox"/>	Cookie01	20	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Queued	X
<input type="checkbox"/>	Cookie02	20	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Queued	X
<input type="checkbox"/>	Cookie03	20	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Queued	X
<input type="checkbox"/>	Cookie04	20	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Queued	X
<input type="checkbox"/>	Cookie05	20	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Queued	X
<input type="checkbox"/>	Cookie06	20	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Queued	X
<input type="checkbox"/>	Cookie07	20	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Queued	X
<input type="checkbox"/>	QuarlosCookie	13	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Queued	X
<input checked="" type="checkbox"/>	MAT_0003	30	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Queued	X
<input type="checkbox"/>	MAT_0001-000	10	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	Processed	X
<input type="checkbox"/>	MAT_0001	10	Kg	Belgas [A]	CookiesFlow [A] Mixing	5	5	In Process	X

Rows per Page: 25 Page 1 of 1 (11 Records)

DETAILS

HOLDS/OFF-FLOWS (0)

PROTOCOL INSTANCES (0)

DOCUMENTS (0)

Dispatch the **Material** to a **Resource** configured to allow partial track-outs. In this case, Dispatch and Track-In are linked, so both will be performed at once:

Dispatch and Track-In Material

RESOURCE

MAT\_0003 (Queued) / Belgas [A] (Belgas Cookies) / Mixing / 30 Kg

Available Resources

- Mixer-01 Mixer-01 Resource
- Mixer-02 Mixer-02 Resource
- Mixer-03 Mixer-03 Resource
- Mixer-04 Mixer-04 Resource
- Mixer-05 Mixer-05 Resource**

Resource Details

Name: Mixer-05  
Description: Mixer-05 Resource  
Area: Cookie Manufacturing  
Priority: 2  
Material(s) Dispatched: 0  
Material(s) In Process: 1  
Running Mode:  
Service: Mixing  
State: Standby

Resource State

New State: Productive

Comments:

Cancel Track-In

After the **Material** is Processed, end processing by performing **Track-Out**. The wizard then opens a new page called **Split Information**, and the default value for quantity configured in the smart table is automatically filled-in:

Track-Out Material

RESOURCE STATE
SPLIT INFORMATION
RECORD LOSS/BONUS

MAT\_0003 (InProcess) / Belgas (A) (Belgas Cookies) / Mixing / 30 Kg

Split Material to Track-Out Information

\* Primary Quantity (Kg): 10

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

Container: Container

Position:

Comments:

Cancel < Back Next >

#### Note

If a **BOM** is configured for any scenario and the Assembly Type is set to **Explicit** or **Explicit Add**, there are two additional preconditions to allow Partial Track-Out:

- Assembled Units must be the same as the Primary Units
- Assembled Quantity is higher than zero or Sub-Material Count is higher than zero.

In this case, since the smart table definition allows you to change the primary quantity to track out, you can change the default value. You can also define whether the Child **Material** is put in a specific **Container** and position, provided the **Container** allows it.

#### Note

You can even decide that you want to perform a complete Track-Out instead of a partial one. Just choose the total quantity of the **Material** and a "normal" Track-Out will take place with no **Material** split. In this situation, the rest of the configuration possibilities are hidden.

Track-Out Material

RESOURCE STATE
SPLIT INFORMATION
RECORD LOSS/BONUS

MAT\_0003 (InProcess) / dtp Belgas [A] (Belgas Cookies) / Mixing / 30 Kg

\* Primary Quantity (Kg): 30

Comments:

Cancel
Back
Next

Regarding losses, the definition of the smart table was to have the Parent (or In Process) **Material** incur the losses. Hence, apply a loss and check the result after the operation concludes.

Track-Out Material

RESOURCE STATE
SPLIT INFORMATION
RECORD LOSS/BONUS

MAT\_0003 (InProcess) / dtp Belgas [A] (Belgas Cookies) / Mixing / 30 Kg

Loss Reasons (Total: 2 Kg)

Broken	2 Kg
Broken	
Burned	0 Kg
Cookie is burned	

Final Quantity: 8 Kg

Loss Reasons Details

Reason: Broken

Loss Quantity (Kg): 2

Comments:

Cancel
Back
Track-Out

After the operation is completed, the information for the split (Child) **Material** is displayed.

Track-Out Material

1 RESULTS

MAT\_0003 (InProcess) / Belgas [A] (Belgas Cookies) / Mixing / 30 Kg

✓ Material(s) was/were tracked out successfully.

New Material(s):

MAT\_0003-000000001

You can see that the Child **Material** is in the Processed state, in the same **Step** with a Primary Quantity equal to the value defined in the wizard:

MAT\_0003-000000001 (Active)

DETAILS

Material

Name: MAT\_0003-000000001  
Description: MAT\_0003  
Type: Production  
Universal State: Active  
System State: **Processed**

Basic Information

Form: Lot  
Facility: Cookie Factory  
Product: Belgas [A]  
Product Description: Belgas Cookies  
Product Group:  
Product Group Description:  
Parent:  
Approved: Yes  
Capacity Class:  
Current Send-Ahead Run:

Flow and Step

Flow: CookiesFlow [A]  
Step: **Mixing**  
Flow Path: CookiesFlow [A] > Mixing

Quantities

Primary Quantity: **10 Kg**  
Secondary Quantity:  
Target Quantity:

Sub-Materials

Sub-Materials: 0  
Sub-Material Primary 0 Kg  
Quantity:  
Sub-Material Secondary  
Quantity:

Resource and Container

Resource:  
Resource Bin/Position:  
Resource Area:  
Container:  
Container Position:

Now you should check the main **Material**, which has the Primary Quantity calculated as follows:

$$\text{New Primary Quantity} = \text{Original Primary Quantity} - (\text{Partial Track-Out Quantity} + \text{Loss Quantity})$$



MAT\_0003 (Active)

DETAILS

Material

Name: MAT\_0003

Description: MAT\_0003

Type: Production

Universal State: Active

System State: In Process

Basic Information

Form: Lot

Facility: Cookie Factory

Product: Belgas [A]

Product Description: Belgas Cookies

Product Group:

Product Group Description:

Parent:

Approved: Yes

Capacity Class:

Current Send-Ahead Run:

Quantities

Primary Quantity: 18 Kg

Secondary Quantity:

Target Quantity:

Sub-Materials

Sub-Materials: 0

Sub-Material Primary Quantity: 0 Kg

Sub-Material Secondary Quantity:

You can finally confirm the genealogy of both **Materials**:

**GENEALOGY**

Refresh

---

ASCENDANTS    DESCENDANTS

NEWEST ↓    OPERATION: ALL ↑

< MAT\_0003

Split to  
08/09/2022 04:29 PM

MAT\_0003-000000001 >

MAT\_0003 > Split to

### Split Details

Date: 08/09/2022 04:29 PM

Material: MAT\_0003

Product: Belgas [A]

Product Description: Belgas Cookies

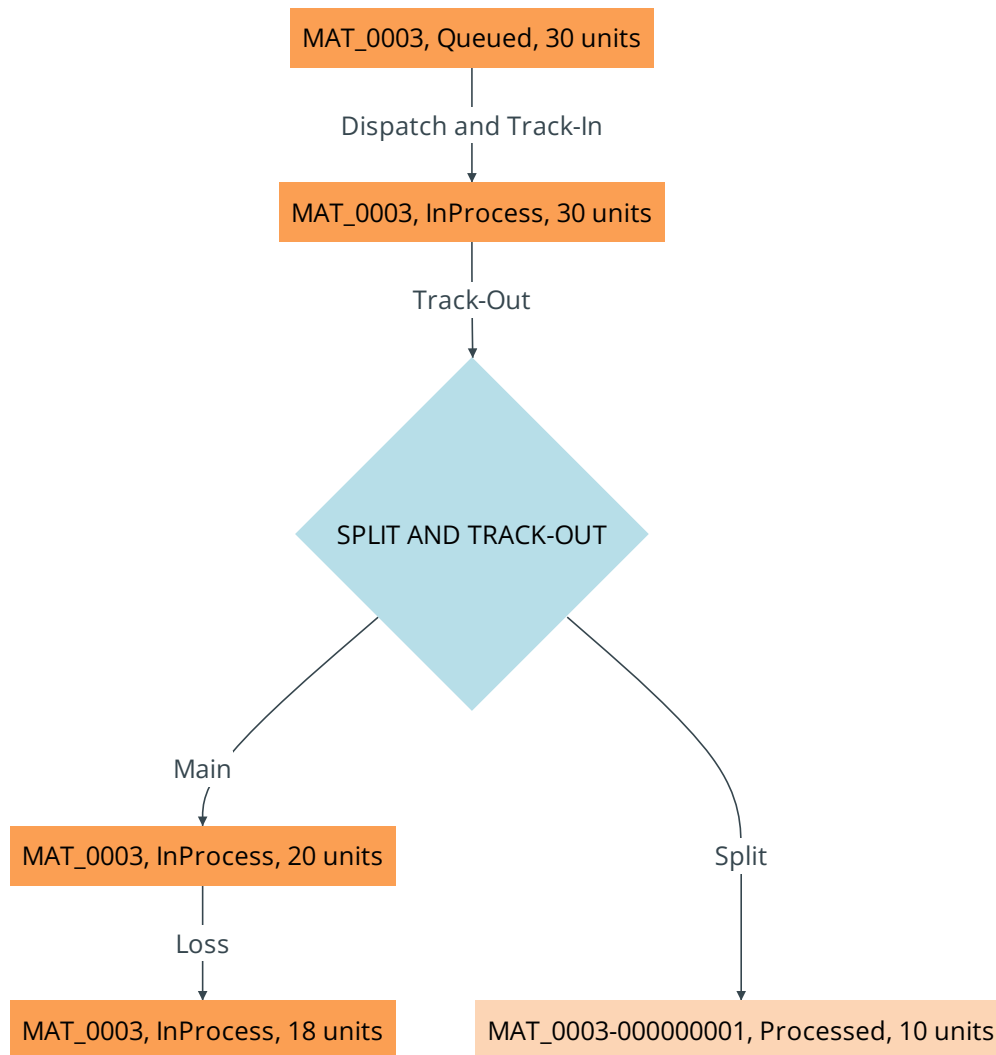
Step: Mixing

Primary Quantity: From 30 to 20 Kg

### Split Materials (1)

MATERIAL	PRODUCT	PRIMARY QTY	PRIMARY UNITS	SECONDARY QTY	SECONDARY UNITS
MAT_0003-000000001	Belgas [A]	10	Kg		

In short, this diagram represents the flow of a traditional Partial Track-Out operation:





# Legal Information

## **Disclaimer**

The information contained in this document represents the current view of Critical Manufacturing on the issues discussed as of the date of publication. Because Critical Manufacturing must respond to changing market conditions, it should not be interpreted to be a commitment on the part of Critical Manufacturing, and Critical Manufacturing cannot guarantee the accuracy of any information presented after the date of publication. This document is for informational purposes only.

Critical Manufacturing makes no warranties, express, implied or statutory, as to the information herein contained.

## **Confidentiality Notice**

All materials and information included herein are being provided by Critical Manufacturing to its Customer solely for Customer internal use for its business purposes. Critical Manufacturing retains all rights, titles, interests in and copyrights to the materials and information herein. The materials and information contained herein constitute confidential information of Critical Manufacturing and the Customer must not disclose or transfer by any means any of these materials or information, whether total or partial, to any third party without the prior explicit consent by Critical Manufacturing.

## **Copyright Information**

All title and copyrights in and to the Software (including but not limited to any source code, binaries, designs, specifications, models, documents, layouts, images, photographs, animations, video, audio, music, text incorporated into the Software), the accompanying printed materials, and any copies of the Software, and any trademarks or service marks of Critical Manufacturing are owned by Critical Manufacturing unless explicitly stated otherwise. All title and intellectual property rights in and to the content that may be accessed through use of the Software is the property of the respective content owner and is protected by applicable copyright or other intellectual property laws and treaties.

## **Trademark Information**

Critical Manufacturing is a registered trademark of Critical Manufacturing.

All other trademarks are property of their respective owners.