Critical manufacturing
an ASM PT company

Containers

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Containers

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Overview

A **Container** is a standardized physical carrier used to hold, protect, organize, and move **Materials**, parts, or other containers throughout manufacturing and logistics processes.

A Container acts as the interface between production, storage, and transportation. It ensures that items can be handled safely, efficiently, and repeatedly across the shop floor.

Manufacturers design containers to match:

- The size and weight of the contents
- The sensitivity of the Materials
- The handling methods used on the shop floor, such as manual handling, forklifts, conveyors, AGVs, or robots

Industrial containers can be:

- Returnable or disposable
- Standard or custom-designed
- Made from plastic, metal, wood, or composite materials

Beyond simple storage, containers support lean manufacturing principles by enabling:

- Visual management
- Work-in-process control
- Ergonomic handling
- Quality protection
- Traceability

A container is therefore not just a box. It is a critical logistics and production asset that connects material flow, safety, efficiency, and quality across the industrial shop floor.

Examples

FOUP for Semiconductor Wafers	**SMT Board Magazine**

Pallet

Trolley of Boxes

SMT Feeders Cart

ESD Box

Tray	Hopper
	

Containers in MES

A **Container** is an object of the **Container** entity that can hold **Materials**, **Resources**, or other **Containers**.

A **Material Container** has a capacity defined by positions available for a given **Material** unit. A **Container** can hold multiple **Materials**, but each position can contain only one **Material**.

Each position:

- Is identified by a unique number
- Has a defined capacity based on specific units

The same concept applies to:

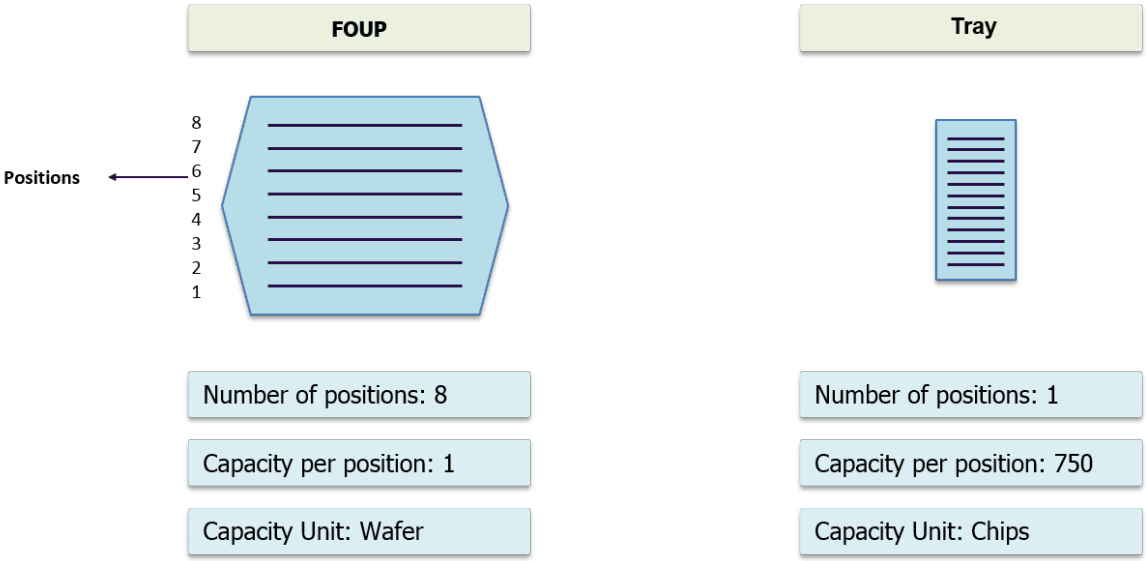
- **Containers** that hold **Resources**
- **Containers** that hold other **Containers** (SubContainers)

```
flowchart TD

    SC[Sub Container]
    C[Container]

    F[Facility]
    MC[Material Container]
    CR[Container Resource]

    M[Material]
    R[Resource]

    SC --> C

    C --> F
    C --> MC
    C --> CR

    MC --> M
    CR --> R

    classDef mermaid_title color:#000, fill:#fafafa, stroke:#fafafa, stroke-width:0x, font-
size:100%, font-weight:200;
    classDef mermaid_start color:#000, fill:#fafafa, stroke:#fafafa, color:#fafafa, stroke-
```

```
width:0x, font-size:100%, visibility: hidden;
    classDef mermaid_businessdata color:#000, fill:#65CDE8, stroke:#65CDE8, stroke-width:0px, font-size:100%;
    classDef mermaid_nonbusinessdata color:#000, fill:#B7DEE8, stroke:#B7DEE8, stroke-width:0px, font-size:100%;
    classDef mermaid_entity color:#000, fill:#FB9F53, stroke:#FB9F53, stroke-width:0px, font-size:100%;
    classDef mermaid_entitylinked color:#000, fill:#FCD5B5, stroke:#FCD5B5, stroke-width:0px, font-size:100%;
    classDef mermaid_context color:#000, fill:#B9CDE5, stroke:#B9CDE5, stroke-width:0px, font-size:100%;
    classDef mermaid_optional color:#000, fill:#B7DEE8, stroke:#65CDE8, stroke-width:1px, font-size:100%, stroke-dasharray: 5 5;
    class C,SC mermaid_entity
    class F,M,P,R mermaid_businessdata
    class MC,CR mermaid_nonbusinessdata
```

A **Container** can be modeled in different ways:

- **Magazine** — one position with multiple units per position (for example, a tray holding several units of the same Material)
- **FOUP (Front-Opening Universal Pod)** — multiple positions with one unit per position (for example, a wafer carrier)
- **Hybrid models** — combinations of both approaches



A **Container** can also be associated with a **Resource** when the Resource supports the position unit types defined in that Container type.

State Model

Containers have a system-defined state model:

- **Available** — the Container can be used (empty or full)
- **Unavailable** — the Container cannot be used
- **In Transit** — the Container is shipping Materials to another Facility

```
graph TD
    Start -->|Create Container| A1
    A1[Available] -->|Make Container Unavailable| A2[Unavailable]
    A2 -->|Make Container Available| A1
    A1 -->|Ship Material| L1[In Transit]
    L1 --->|Unship Material<br>Receive Material| A1
```

```
classDef mermaid_start color:#000, fill:#fafafa, stroke:#fafafa, color:#fafafa, stroke-width:0x,
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size:100%;
classDef mermaid_state color:#000, fill:#d7e4bd, stroke:#000, stroke-width:1px, font-size:100%,
font-weight:300;
class Start mermaid_start
class A1,A2,A3,A4,A5,A6,A7,A8,A9,A10,A11,A12 mermaid_state
class L1,L2,L3,L4,L5,L6 mermaid_entitylinked
```
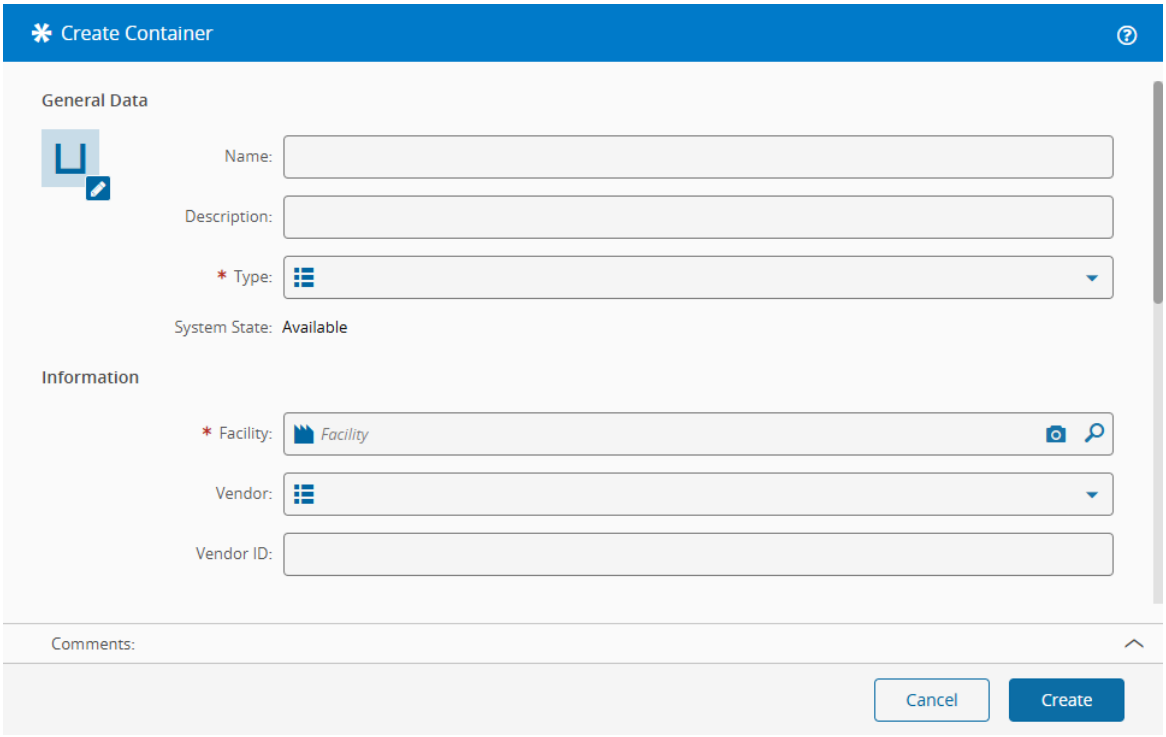

You can also create custom **State Models** for Containers.

Container Creation

The Container creation wizard includes several required fields:

- **Name** — identifies the Container
- **Type** — used in configuration tables for container restrictions
- **Facility** — defines where the Container will be used

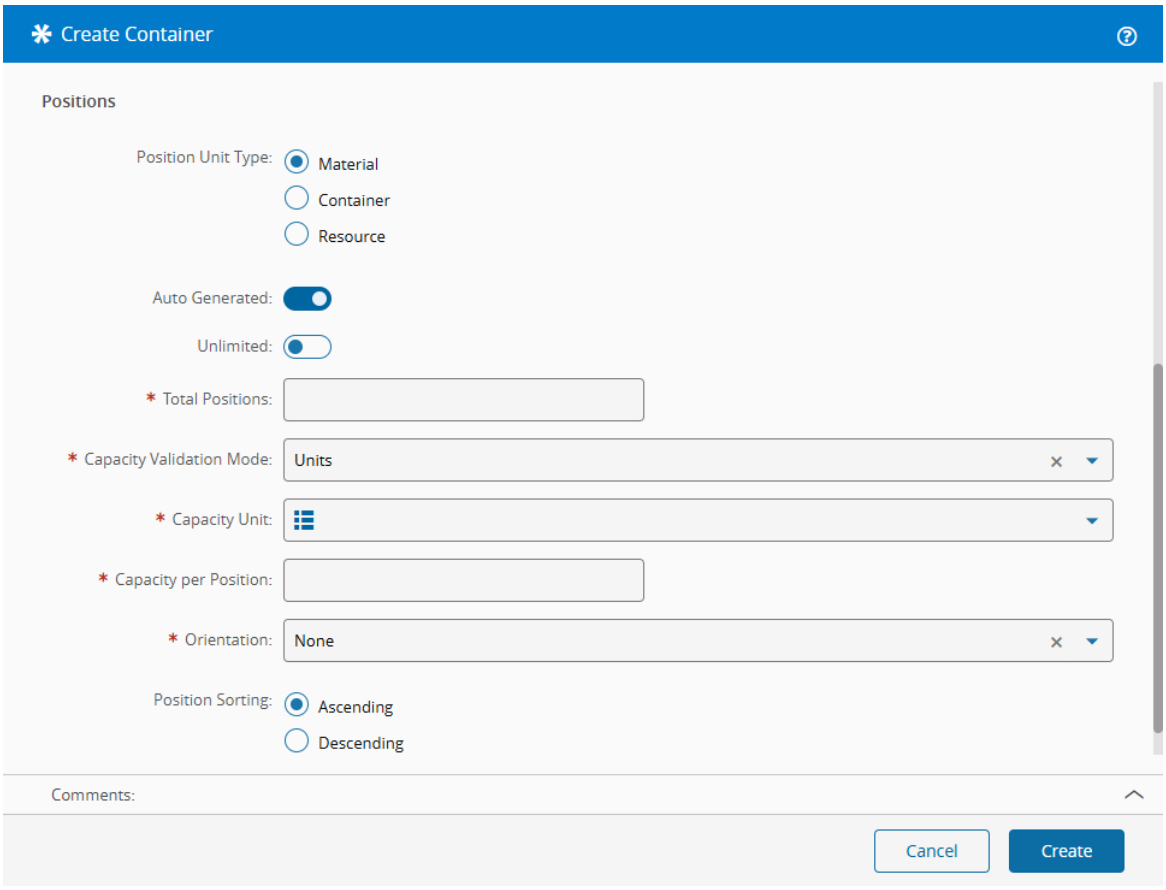


Additional configuration fields include:

- **Position Unit Type** — defines whether the Container holds Materials, Containers, or Resources
- **Total Positions** — defines the number of usable positions
- **Capacity Validation Mode** — available only for Material containers

If the **Capacity Validation Mode** is set to **Unit**, you can define the maximum Material quantity per position using **Capacity per Position**.

> **Info**
>
> For more information, refer to the User Guide: Create Container



Container Operations

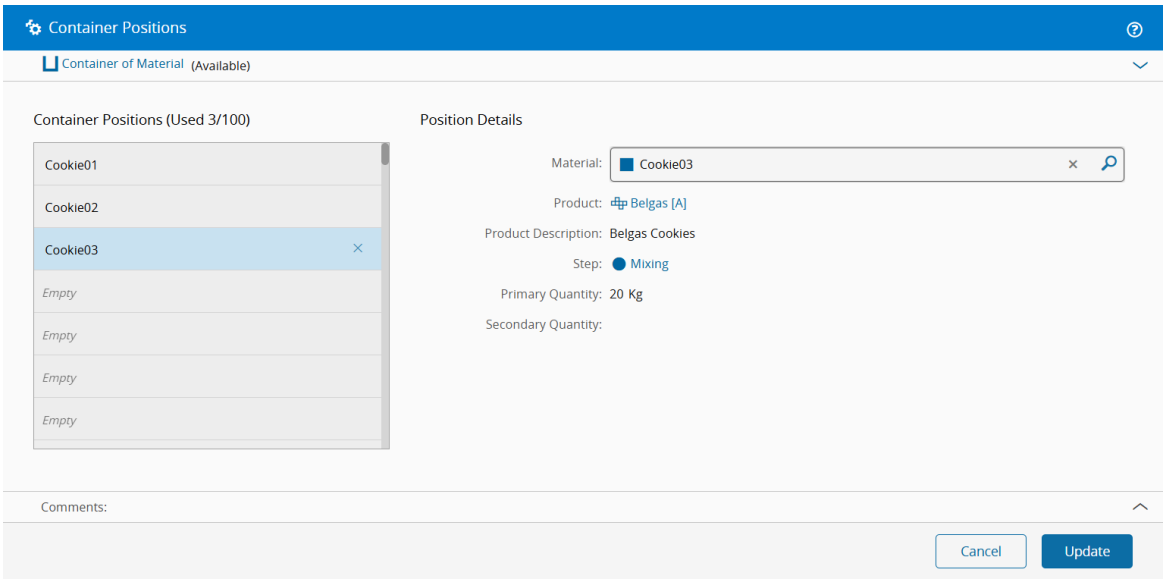
Manage Positions

Use **Manage Positions** to add or remove objects from Container positions.

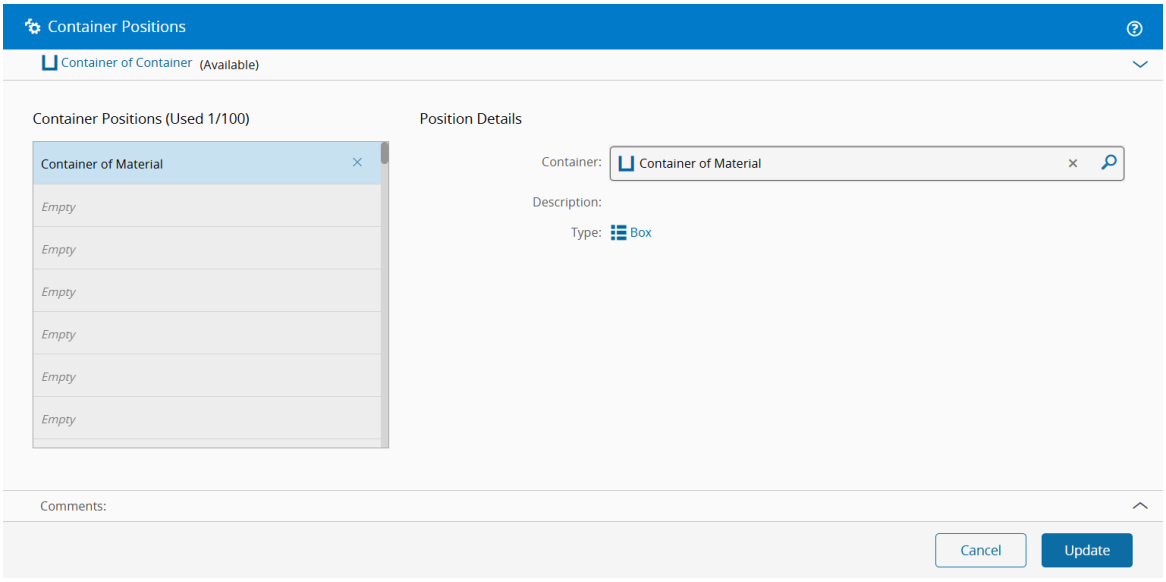
The operation works the same way for all **Container Position Unit Types**:

- Material
- Container
- Resource

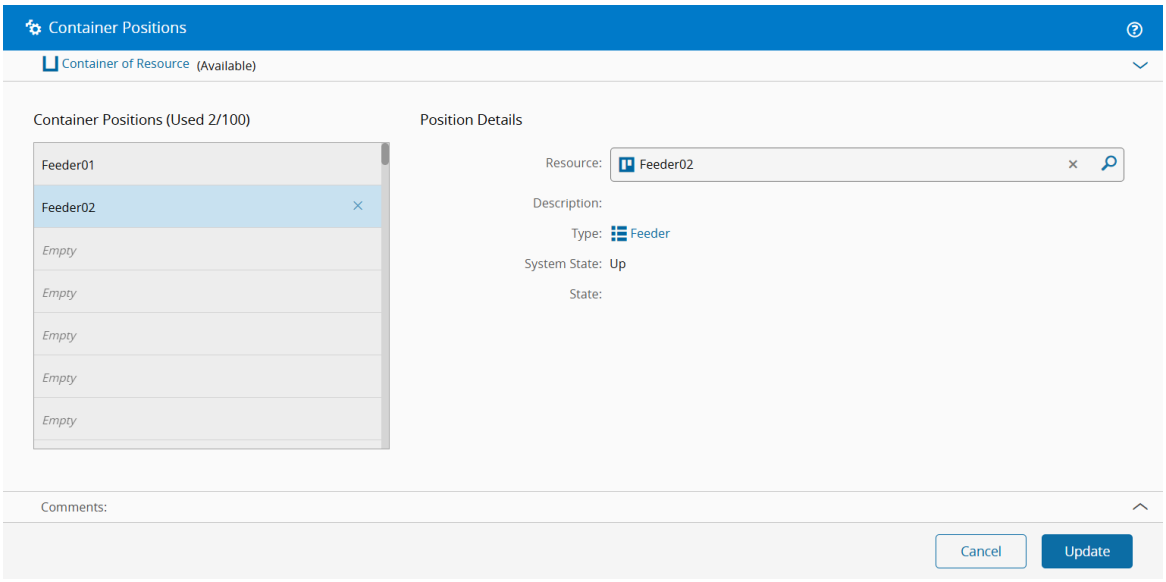
For **Material** or **Container**:



For **Container of Containers**, define the relationship between the container and sub-container in the **Container Type Relation** Generic Table.



For **Container of Resources**, define the relationship in the **Container Resource Relation** Generic Table.



Empty

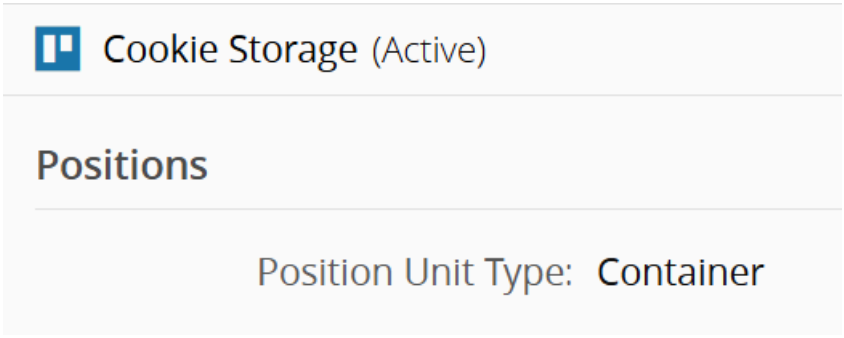
The **Empty** operation removes all objects from the Container.

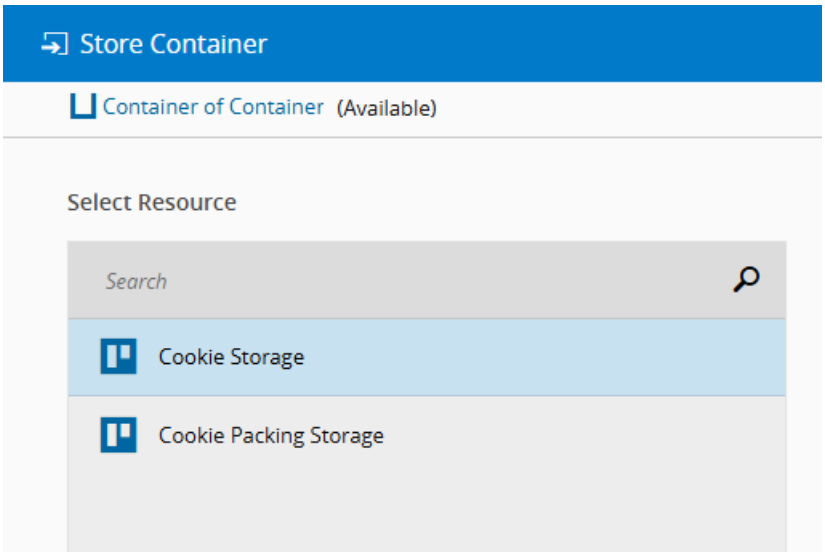
Store

The **Store** operation places the Container in a **Storage Resource** located in any **Area** that belongs to the Container **Facility**.

Precondition:

The Storage Resource must have **Position Unit Type = Container**.





Retrieve

The **Retrieve** operation removes the Container from storage.

Dock

Use **Dock** to dock a Container to a **Resource**.

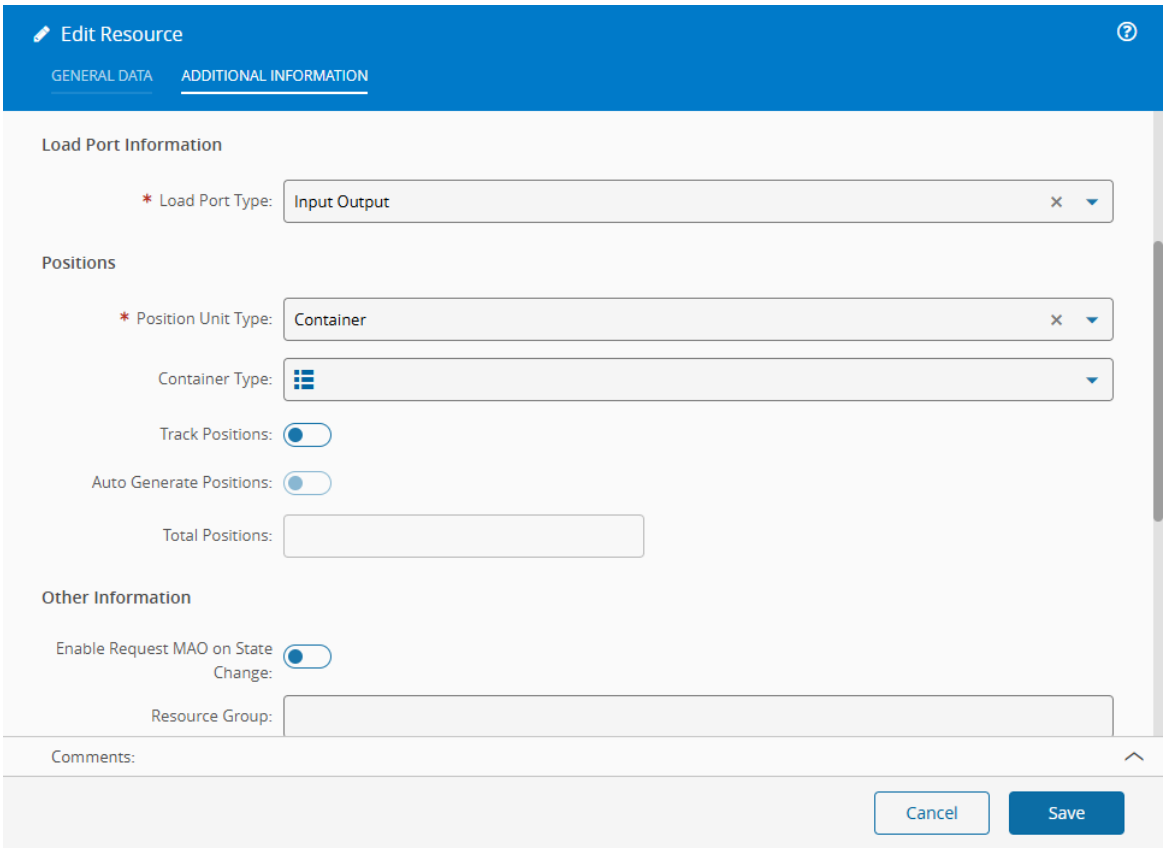
Docking can occur on Resources with the following processing types:

- **Load Port**
- **Process**

Load Port Docking

Requirements:

- The Resource must have a **Load Port Type** selected
- The **Position Unit Type** must be **Container**



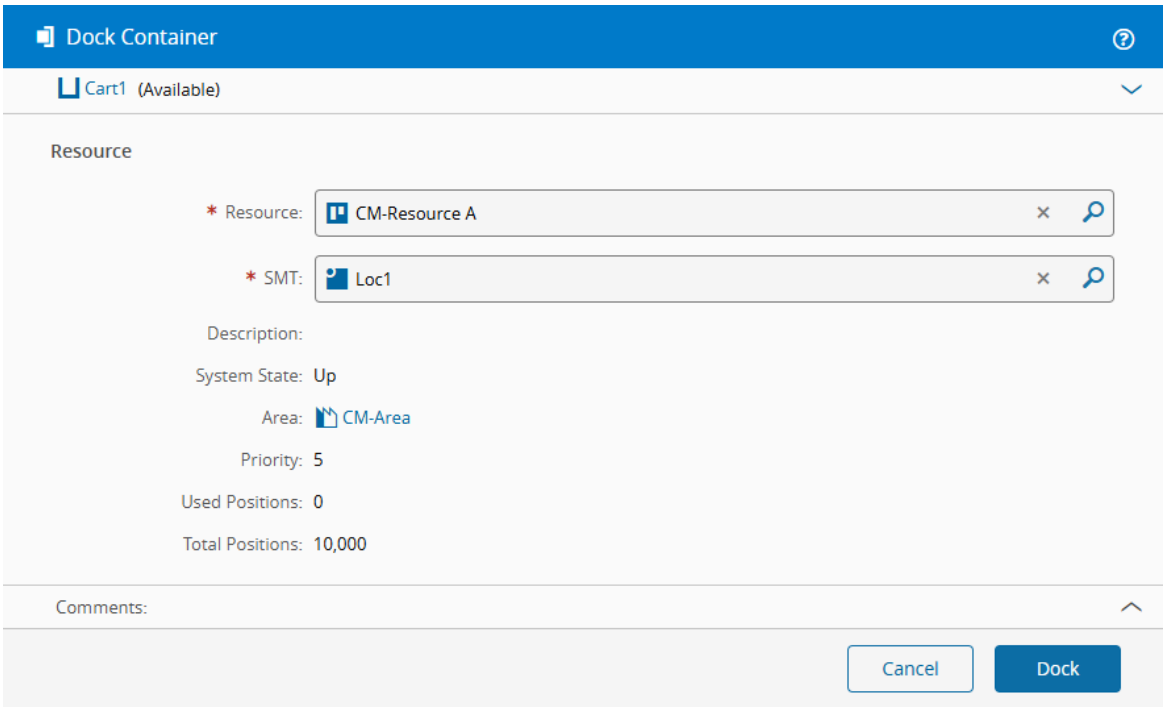
Example:

In SMT lines, loader and unloader machines handle magazines of electronic boards.

Process Docking

Requirements:

- The Resource must have **Locations enabled**
- A valid **Location** must be selected



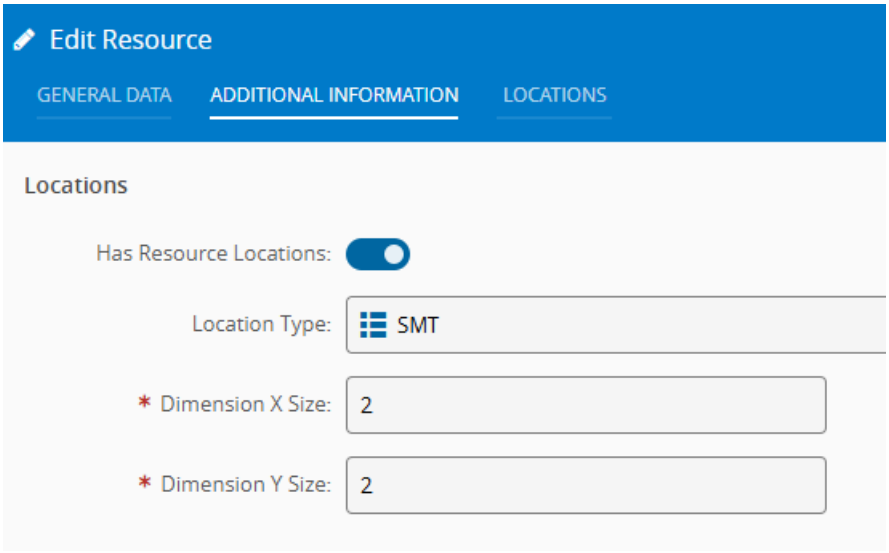
When docking a **Container of Resources** (for example feeder carts), the system automatically considers the Resources as consumable feeds in the docking Resource.

Example:

In SMT lines, component placement machines can handle multiple feeder carts.

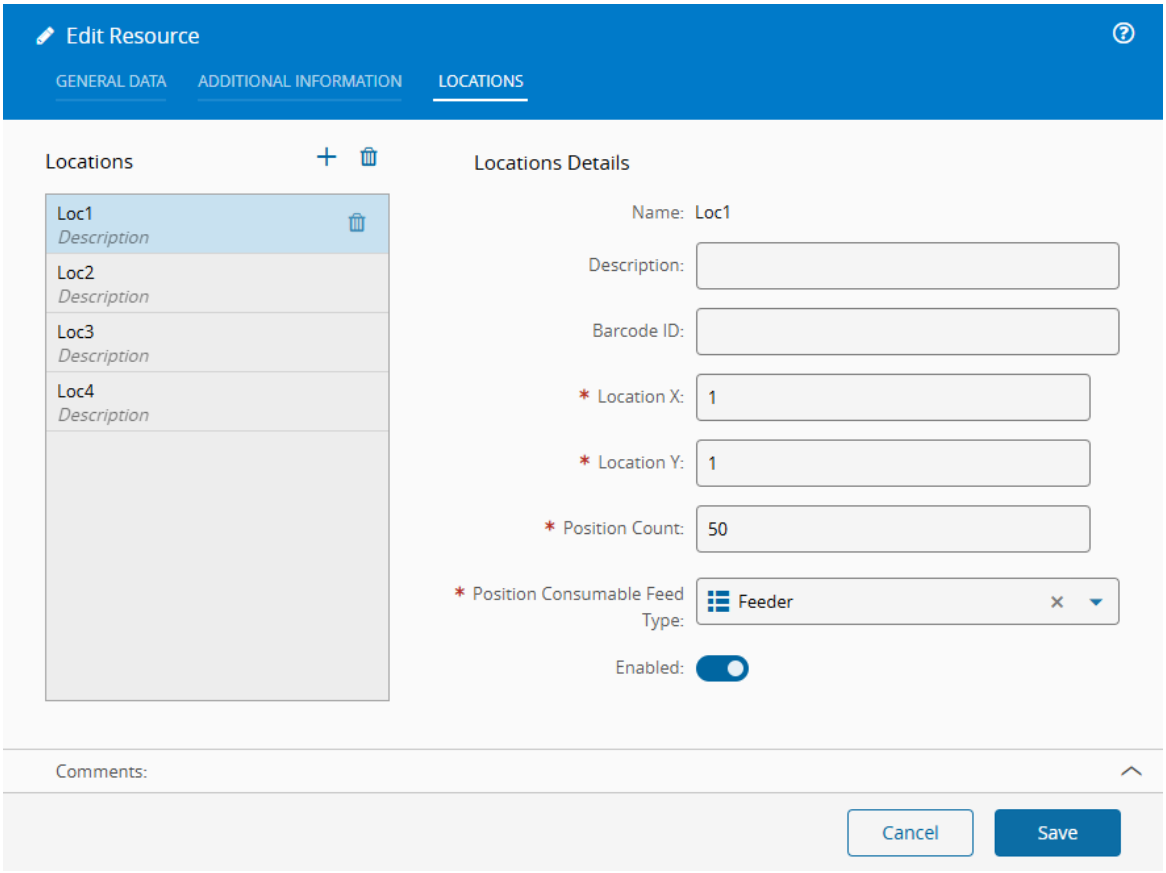
The docking Resource must have:

- **Has Resource Locations** enabled
- **Location Type** defined
- **Dimensions** configured



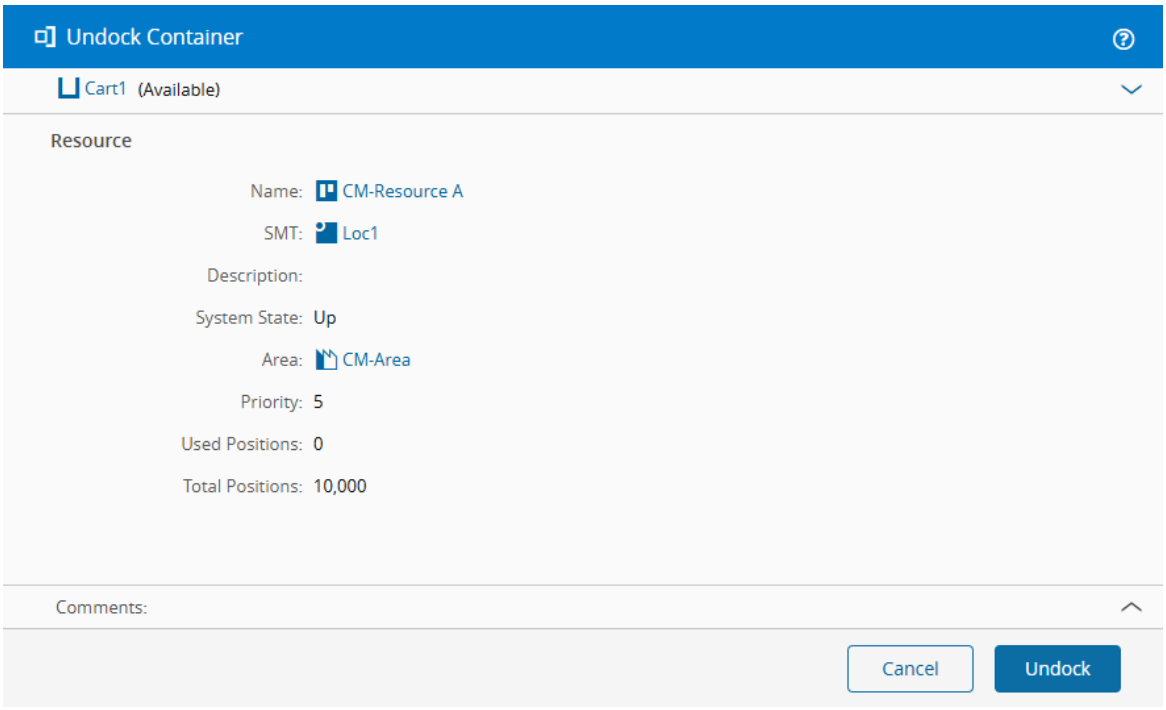
Locations must include:

- Location
- Position Count
- Position Consumable Feed Type
- Enabled status



Undock

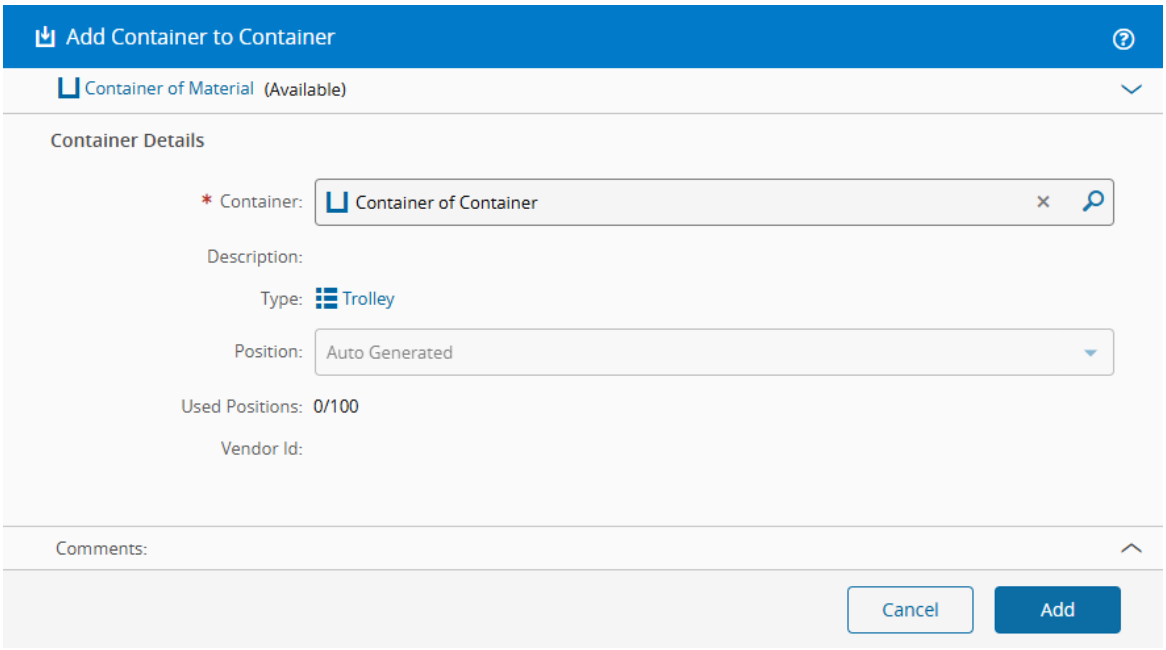
The **Undock** operation removes the Container from the Resource.



Add

Use the **Add** operation to assign the current Container to a **Parent Container**.

Define the relationship in the **Container Type Relation** Generic Table.



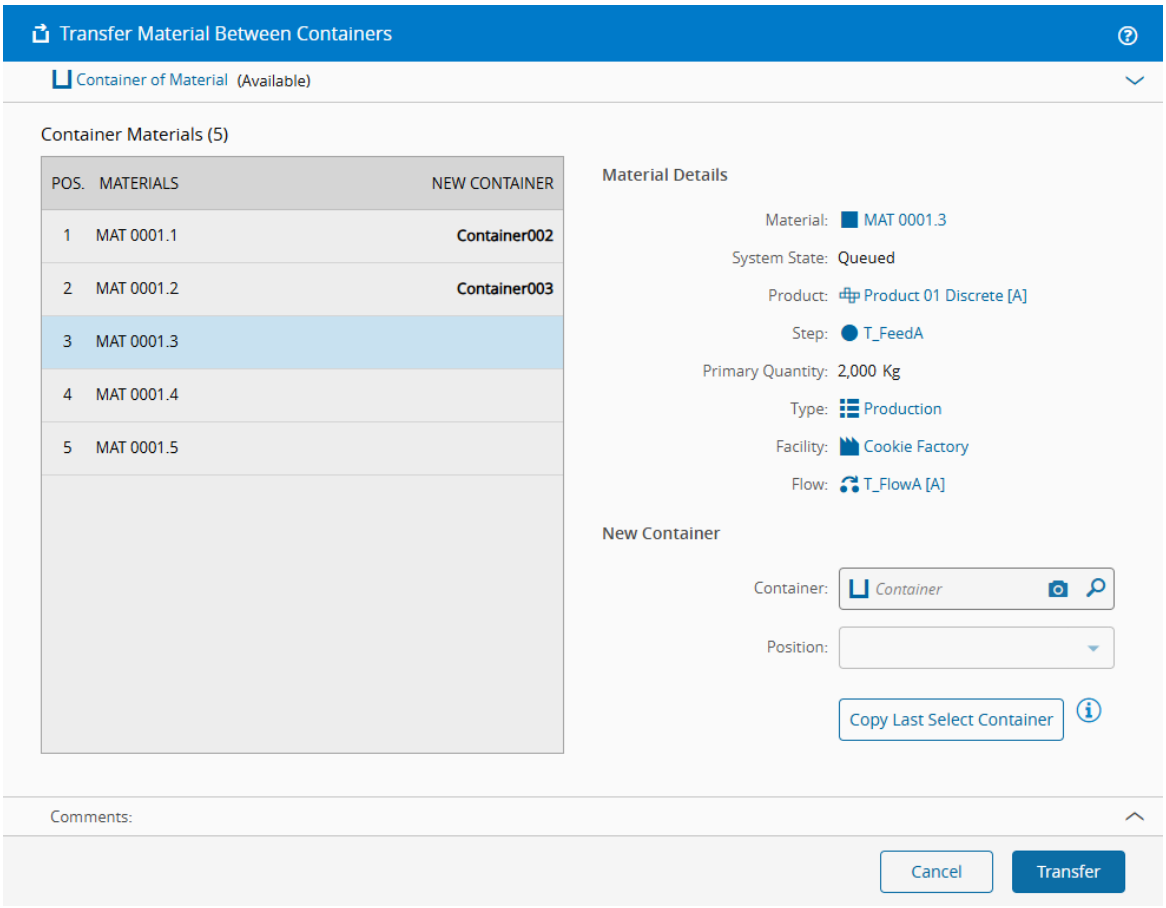
Transfer

The **Transfer** operation transfers the contents of a Container to another Container.

The operation name varies depending on the **Container Position Unit Type**:

- Transfer Materials
- Transfer Resources
- Transfer Containers

You can transfer each position to a different Container.



Make Unavailable

Sets the **System State** of the Container to **Unavailable**. In this state, the Container is not visible in selection lists.

Make Available

Changes the Container **System State** back to **Available**.

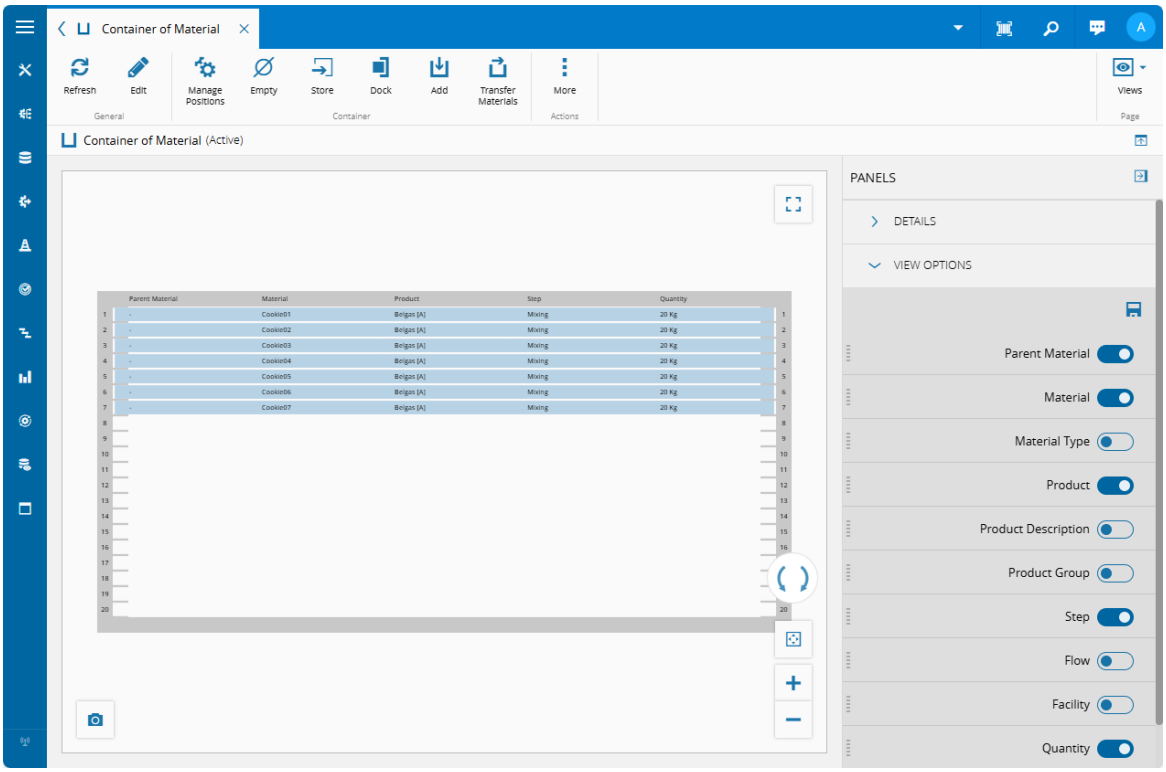
Container View

The **Container View** displays the Container layout and contents.

You can:

- Visualize positions and assigned objects
- View details of the selected position

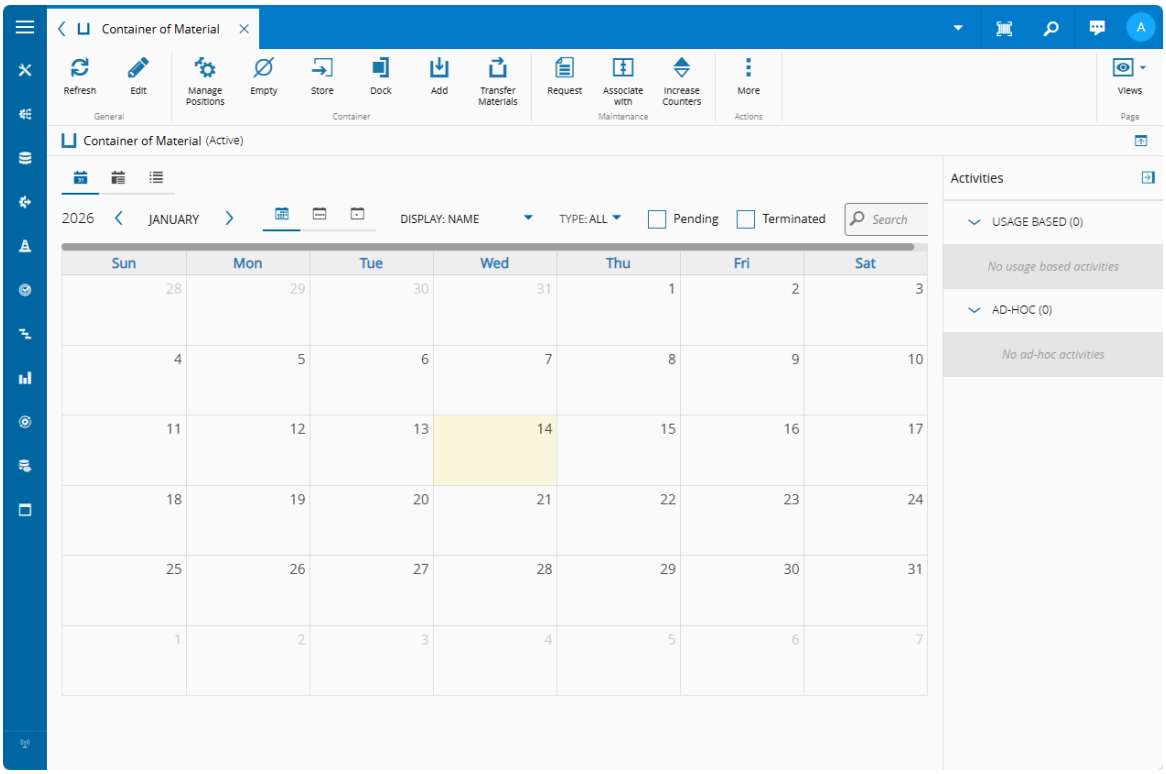
- Customize visible columns in **View Options**



Container Maintenance View

The **Container Maintenance View** displays scheduled and ad-hoc **Maintenance Action Orders (MAO)** related to the Container.

For more information, refer to Maintenance Management.



Material Container Type Context

The **Material Container Type Context** Smart Table defines restrictions for container usage.

You can restrict container types based on:

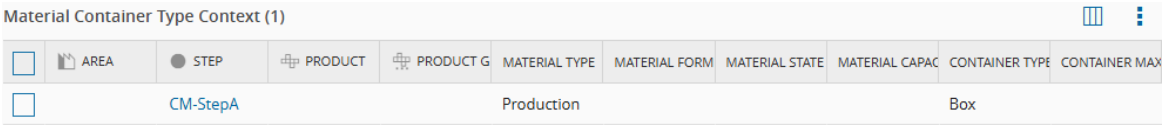
- **Area**
- **Step**
- **Product**
- **Product Group**
- **Material Type**
- **Material Form**
- **Material State**
- **Capacity Class**

You can also define the **maximum number of usable positions** for a Container type.

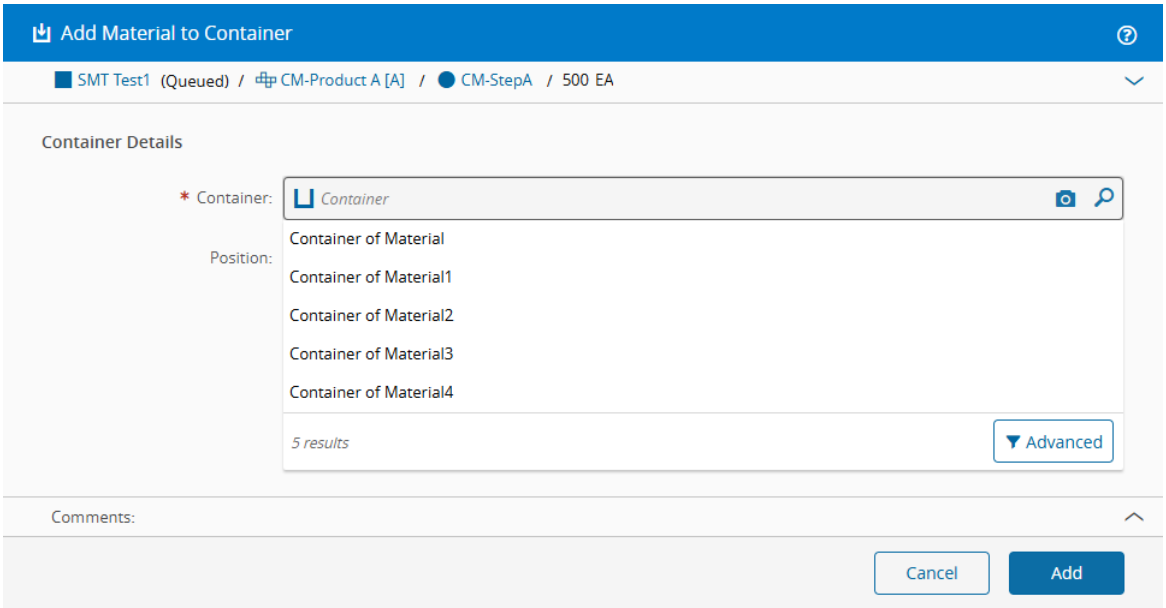
> **Note**
>
> To select a Step in this Smart Table, enable the Use Container Restrictions property.

Example

Example configuration using **Step**, **Material Type**, and **Container Type**.



In this configuration, when you attempt to add a **Material** of type **Production** at the selected Step, only Containers of type **Box** appear in the selection list.



Container

Name: Container of Material

Description:

Type: Box

Universal State: Active

System State: Available

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