# **4.4. Production order**

Production orders also inherit the Produmex Manufacturing extension settings from their base Bill of Materials. For production orders other extensions are available, including '*Milestone Groups*', '*Due Time*', and '*Allocation Strategy*'.

## 4.4.1. Header and Grid

## Row type

A row in a BoM may be of type:

- Material (purchased or own-manufactured)
- Operation
- Unfinished Product (unfinished product sent to the outsourcing partner)
- Unfinished Material (unfinished material received from the outsourcing partner)
- Supplier Material
- By-Product (a material with negative quantity)
- Phantom (a virtual item in SAP Business One)
- Cost (any non-inventory item)

The sequence of materials and operations are important: materials required for an operation should come above (from top down) the operation, while produced products should come below. It is possible to define operations that do not require materials or do not create products.

The system differentiates purchased and own-manufactured materials. Materials that have their own BoM are regarded as own-manufactured. These materials are indicated with a factory icon on the 'Row Image' field. When clicking on the yellow arrow, for own-manufactured materials the BoM, while for purchased materials the Item Master Data will open.

The operation quantity indicates the time required for the process. The initial parameters of an operation are copied from the manufacturing operation, and these parameters may be customized for the BoM. The operation details form can be opened by clicking the row image icon. An operation can be defined as outsourced too. Fully outsourced operations are indicated with a different icon on the 'Row Image' field.

## **Row Image**

Indicates the row type.

🛒 💾 🚝	raw material/subassembly material/supplier material
🌯 🧟 🎊 🌋	operation/fully outsourced operation/operation cannot be allocated/finished
🛒 🛋	unfinished product/unfinished material
×	by-product

×	phantom item
×	cost

To see the Operation Details form, click on the Row Image of the operation.

#### Milestone Type

The two main function of milestones is to connect the operation lines with the belonging materials and to determine for what operations PDC information should be captured.

With the help of the milestones, during a PDC booking for the operation line the belonging materials or the product can also be booked. Milestones can be set for every BOM line where the row type is not 'Cost'. You can set the milestone type at a phantom line, but it makes no sense as the milestone settings from the BoM of the phantom item will be used in the production order.

The 'Milestone type' field can have five values:

- *None*: The milestone is turned off.
- *Milestone*: The line is a milestone. Only operations can be milestones.
- *Depends on Begin*: The line is a dependent line that will be issued when a Start Job is reported for the belonging operation.
- *Depends on Every*: The line is a dependent line that will be issued/received at every PDC booking where a quantity is booked. (Partial job/Complete job)
- *Depends on End*: The line is a dependent line that will be issued/received at every complete job booking for the belonging operation.

We recommend to only use the 'Depends on End' milestone type if the base quantity of the material is 1 and only 'Completed' job bookings are used.

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For the depending line the issue type must be 'Manual' while for operations it must be 'Backflush'. Outsourced operations must be set to milestones and the issue method for an unfinished product must be set as 'Backflush'. To set a milestone for the product, use the 'Milestone type' column on the BoM.

When you save the BoM, there is a validation for the milestones.

A warning will appear if there is no belonging operation for a material line with a 'Depends on...' milestone setting.

The saving will be blocked in the following cases:

- There is a material line with the milestone type set to 'Milestone'.
- There is an operation with the Issue Method is 'Manual'.
- There is a material with the milestone type set to a Depends on... setting but the Issue Method is 'Backflush'.
- There is an outsourced operation that is not set as a 'Milestone'.

• There is an unfinished product with 'Manual' issue method.

#### BxID

Internal identification value.

#### **Rejected Warehouse**

Add the warehouse code where the rejected unfinished products or by-products will be stored to this field to the respective lines. For MultiBranch company databases the add-on validates if the rejected warehouse is in the same branch as the branch defined for the bill of materials row warehouse.

#### Milestone groups

Production orders inherit the milestone type from the base BoM. An additional 'Milestone Group' field is added to the production orders which contains the code of the operation the line belongs to. This field is automatically set by the add-on based on the milestone settings and it cannot be changed manually.

#### Allocation error

Operations with allocations errors are indicated with an icon on the 'Row Image' field.

#### Due Date & Due Time

After the production order is added/updated, an advanced MRP runs in the background and calculates the due dates and times the operation must be finished/ the material must be available.

#### **Manual Planning**

Defines whether this line is taken into account by the MRP logic or not.

#### **MRP** result

On operation lines indicates whether there is an error with the allocation or not.

## MTO scenario

If the production order is a part of an MTO chain and its subassembly line has an MTO production order, the MTO scenario code is displayed on this field on the line of the subassembly.

## **Operation Reference**

In material lines it shows the BX ID of the linked operation. In operation lines it shows the BX ID of the next operation.

## **Planned Outsourced Quantity**

The planned outsourced quantity of an unfinished product.

## **Completed Outsourced Quantity**

The completed quantity of the unfinished product received from the subcontractor.

## **Rejected Outsourced Quantity**

The quantity of an unfinished product that was booked as 'Rejected' by the quality inspector.

## **Completed Quantity**

The completed quantity booked with PDC for an operation.

## **Rejected Quantity**

The quantity booked as 'Rejected' with PDC for an operation.

## 4.4.2. User Defined Fields

#### Milestone type

To set a milestone for the product, use the 'Milestone type' UDF on the BoM. As the product is never an operation, it makes no sense to set the milestone type as 'Milestone'. When set as 'Depends on...' it is always connected to the last operation of the BoM.

#### **Calculation Base Quantity**

The Calculation Base Quantity is an estimated quantity of a typical production order created from the BoM. This number is used when the setup and shutdown costs are calculated for a single unit of product. For more information please see: Cost calculation

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#### **Rejected Warehouse**

Defines the warehouse used for rejected main products. For MultiBranch company databases the addon validates if the rejected warehouse is in the same branch as the branch defined for the bill of materials header warehouse. Keep in mind that SAP B1 does not validate branch consistency for BOMs; it validates for production orders but not for BOMs. This is why the add-on introduced a new Master Data Configuration Setting named "BOM Branch Validation Level".

#### Is Auto Roll

If set to 'Yes' the due date and time of an MTO child order is automatically aligned with the begin date and time of the parent production order. This setting is only taken into account if the 'Auto Roll child MTOs' option is enabled on the MTO tab of BX Core settings.

#### BxID

Internal identification value.

#### **Operation Granularity**

The operation granularity value impacts the allocation algorithm. The quantity produced in the operation during the allocation must be a multiple of this value. If the operation granularity value is set to zero, the allocation can be continuous.

#### **Custom Code**

On the 'Custom Code' field a generic BoM code can be added. This code can contain letters and numbers.

By default the production order created from the BoM only inherits the 'Milestone type' and 'Rejected Warehouse' UDFs. In order to copy other UDF settings to the production order, set the UDFs on the UDFCopyFromBoMToProdOrder table.

#	Code	Name	Column Name	Is Active		Last Modif.	7
1	CusCd	Custom Code	U_BXPCusCd	Yes	•		
2	IsRol	Is Auto Roll	U_BXPIsRoll	Yes	•		
3	OpGrn	Operation Granularity	U_BXPOpGrn	Yes			
4				Yes			
							-
	4						•

## Allocation strategy

On the 'Allocation Strategy UDF' the scheduling logic for allocations can be defined. The default the allocation strategy depends on the '*Default ProdOrd. Allocation Strategy*' set on the Production order tab of Produmex Manufacturing settings.

There are three possible values:

- **Back From Due Date**: The system starts the allocation from the Due Date of the Production Order and the last operation. Resources are allocated backward.
- **Forward From Preferred Date**: The preferred date is calculated from the due date, the total duration of the production order and the safe completion factor defined on the MRPProdOrderSafeComplFactor field on the MRP tab of Produmex Manufacturing settings.
- **Forward From Earliest Date**: The earliest start date is calculated based on the 'Minimal delay for begin' setting, the Document Date of the production order and the material availability determined by the material flow. The add-on starts the allocations from this date and schedules the operations forward starting with the first operation of the production order.

Today	Today + MRP Earlies	st				Due Date
7/10	7/12	7/18	7/20	7/22	7/28	7/30 t

When using forward scheduling, the End Date/Time of the production might be later then the due date. In this case a warning will appear when creating/updating the production order.

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#### **Due Time**

Produmex Manufacturing extends the production order Due Date with a time component. With the Due Time production planning is detailed at the time of day level.

#### Force Reallocation

To recalculate the allocations for the production order, set the 'Force Reallocation' option to 'Yes' and click update. After the reallocation, the value will be set back to 'No'.

Scheduling dates and times are displayed on UDFs that can be overviewed under the 'Allocation' category among the allocation message and state.

Under the 'Outsourcing' category outsourcing parameters of the production order can be seen.

Under the 'Planning' category key planning dates and times of the production order are displayed.

Under the 'Technical' category information about the parent order (if any) and other technical details

can be overviewed.

Under the 'General' category production comments, missing capacity information and MTO details are indicated.

## 4.4.3. Right-click menu

## Allocation status

To see the list of allocation errors for the production order after the creation or an update, select the 'Allocation status' option from the right-click menu. On the opening 'System Message' form allocation errors will be listed.

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## **Operations Sequence Diagram**

To review the schedule/planning/allocations of a single production order, open the 'Operations sequence diagram' form. The form can be reached from the right-click menu of the production order.

On the form the operations of the production order are displayed in the required order with the work center allocations and the completion percentage.

When a production order is in '*Planned*' status, no actual work center capacities have been allocated for its operations. Still, in this status an operation sequence diagram can be shown by right-clicking the production order form. In the operation sequence diagram for a planned production orders the work center allocations are only temporarily made; a kind of simulation.

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## **Allocation Report**

After a production order has been created or updated, the Allocation/calculations results report can be opened from the right click menu to overview the allocations. The red cog indicates an allocation error where the system could not allocate enough capacity for the operation.

Allocation/calculation results	
Allocation results	
- 😂 #578 Calculating allocations from DueDate 02/13/17 12:00 AM backwards	
12. Material cOST2 x 1 has to be ordered at (to be ready at 02/13/17 12:00 AM)	
9 11. Operation oPBI x 1 all inhouse allocated from 02/13/17 10:25 AM to 02/13/17 12:00 AM	
B _ Inhouse gty: 1 allocated from 02/13/17 10:25 AM to 02/13/17 12:00 AM	
Allocation ERROR: AllocationError, quantity: 0.000000 of 1.000000 allocated, WorkCenters: wAS Date range: 12/30/1899 12:00:00 AM-12/30/	1899 12:00:00 AM.
10. Material m6 x 1 has to be ordered at (to be ready at 02/13/17 10:25 AM)	
9. Material m5 x 1 has to be ordered at (to be ready at 02/13/17 10:25 AM)	
■ 😨 8. Operation oPOA x 1 all inhouse allocated from 02/13/17 10:25 AM to 02/13/17 10:25 AM	
5. Material cOST1 x 1 has to be ordered at (to be ready at 02/13/17 10:25 AM)	
🖶 😨 4. Operation oPAS x 0.5 inhouseOty, 0.5 outsourced qty allocated/outsourced from 02/13/17 10:25 AM to 02/13/17 10:25 AM	
3. Material m4 x 2 has to be ordered at (to be ready at 02/13/17 10:25 AM)	
2. Material m3 x 1 has to be ordered at (to be ready at 02/13/17 10:25 AM)	
I. Material mM1001 x 1 has to be ordered at (to be ready at 02/13/17 10:25 AM)	
Calculated/allocated ToDueDate begin=02/13/17 10:25 AM, end=02/13/17 10:25 AM	
= #578 Calculating allocations from earliest possible date, starting from date 02/13/17 11:25 AM	
= #576 Calculating allocations from preferred date	
#576 Allocating from preferred date #576 Allocating from preferred date	
= #370 Allocating from prefered date	
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Close	

#### Job Requirements Report

For more information please see: Requirements Report

#### **Material Requirements Report**

For more information please see: Requirements Report

#### **Missing Capacity Report**

On the missing capacity report operations from the production order are listed if the total capacity needed for the operation is not available. Select a line and click on the 'Job Scheduling Control Panel' button to see the work center in question on the control panel.

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#### **Resource Allocations**

For more information please see: Resource Allocations. Please note: As 'Planned' production orders do

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not have permanent allocations, the allocation report is not available for 'Planned' production orders.

## Job Scheduling Control Panel

For more information please see: Job Scheduling Control Panel

## **Calculate Production Orders**

For more information please see: Cost calculation

## **List of Calculated Production Orders**

For more information please see: Cost calculation

## **MTO Planning**

For more information please see: MTO Planning

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