Make-to-Order Manufacturing and Purchasing

Produmex Manufacturing is a legacy product and Boyum IT Solutions no longer sells new installations for it.

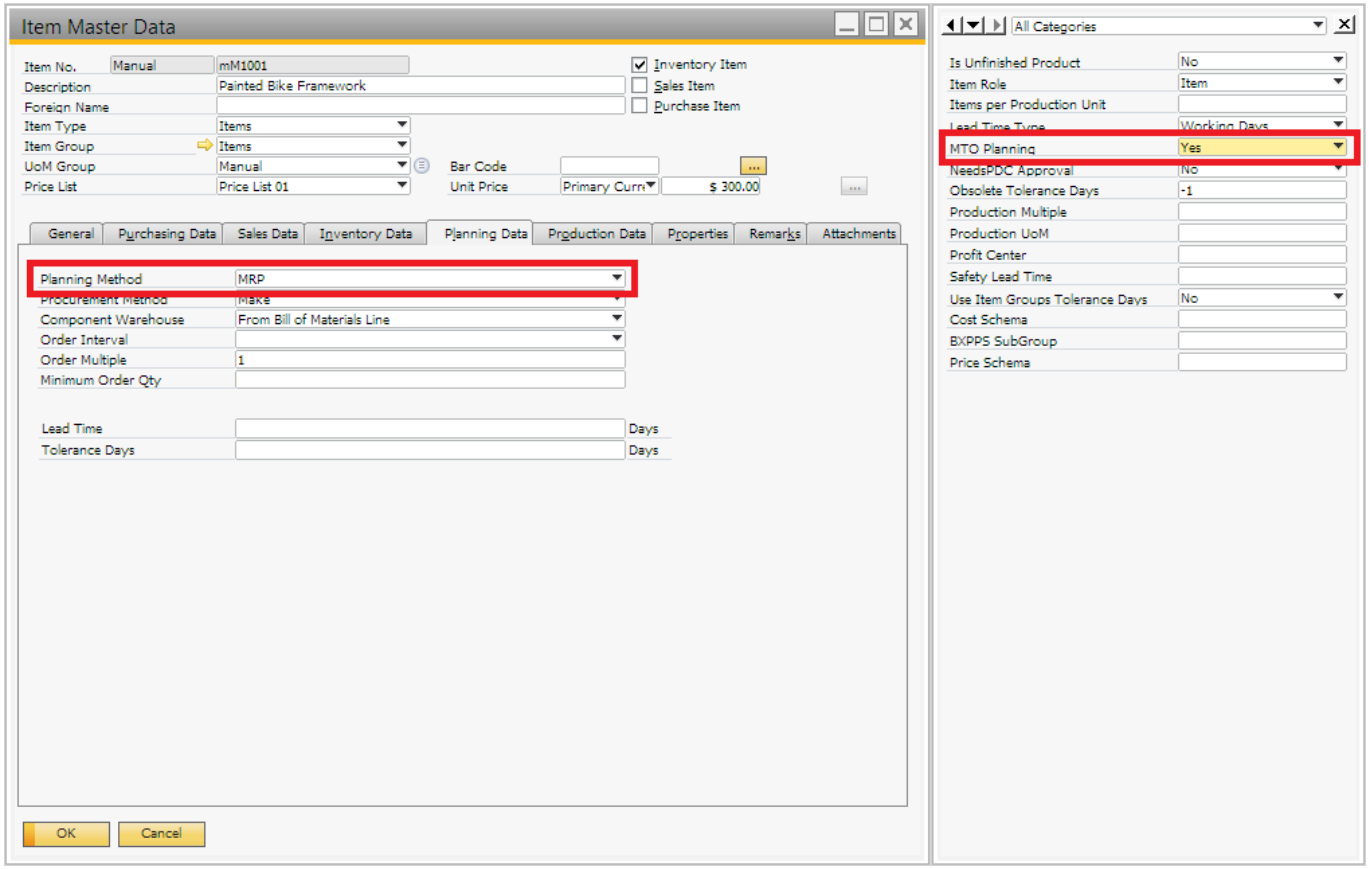
With MTO planning business activities such as manufacturing, assembling and purchase, can be planned strictly based on incoming sales orders or in-house production orders. The generated purchase and production orders are traceable as every child order is linked to the triggering top order. Since sales or production orders usually have a number of lines, multiple child orders may belong to a top order. Requirements for the same item from multiple top order lines can be combined into a single scenario.

The add-on uses the Produmex extended Material Resource Planning. The production and purchase order recommendations are placed in separate MRP scenarios with the MRP parameters. The MRP logic of the MTO add-on stores the recommendations in dedicated scenarios. These scenarios created by the MTO add-on can be regarded as a kind of ‘projects’, which are independent of the SAP Business One built-in project-machinery.

1. Configurations

Adjust the settings of the MTO process on the MTO tab of the Produmex Manufacturing Settings screen.

To configure items for MTO planning, set the *‘MTO Planning’* UDF to ‘Yes’ on the Item Master Data of the item.
Please note: the *‘Planning Method’* of the item should be ‘MRP’. Order recommendations will be created based on the *‘Procurement Method’* of the item. Production orders will be recommended for items with ‘Make’ Procurement Method and purchase orders for items with ‘Buy’ method.



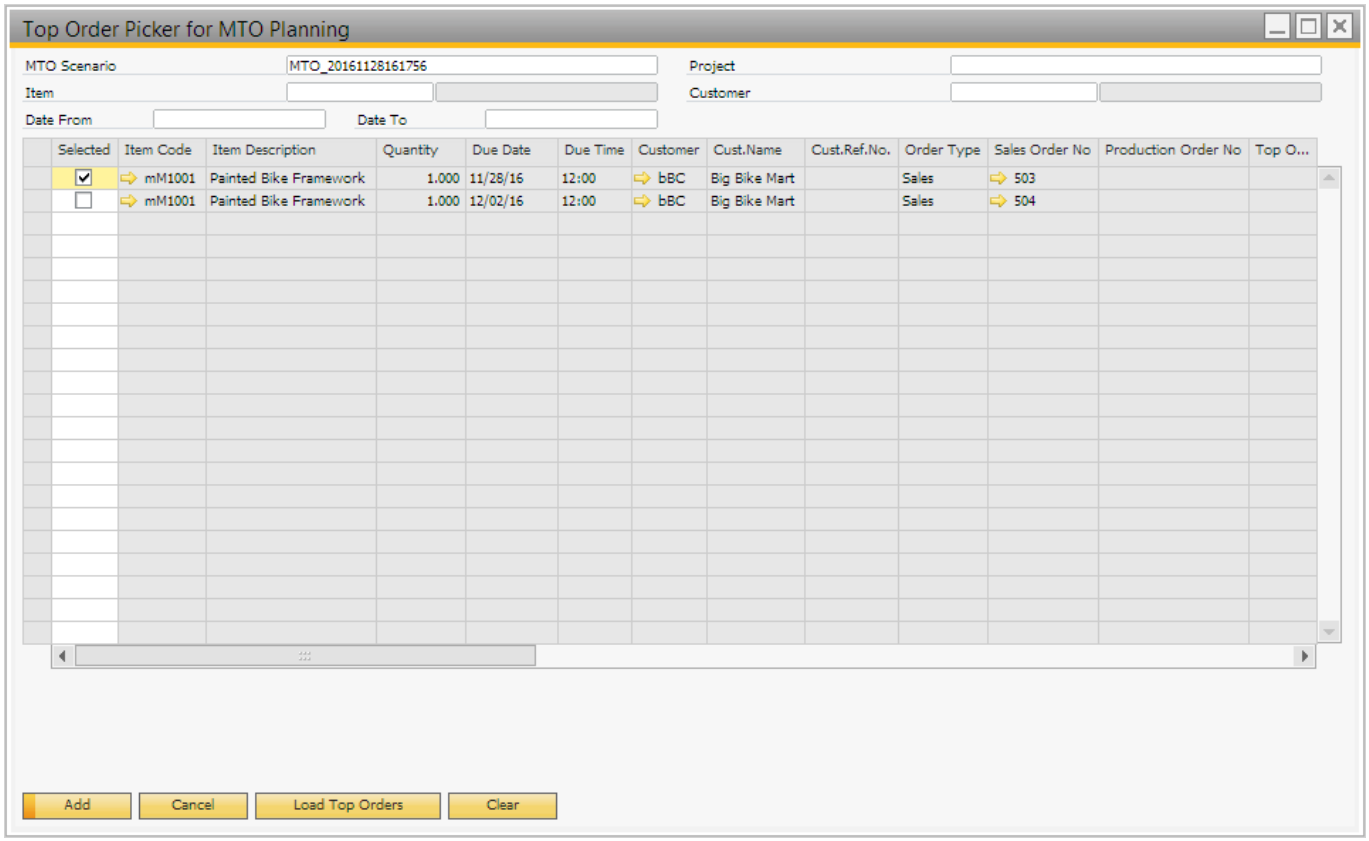
2. Initiate MTO

The scheduling of MTO specific procurement can be initiated from the base document. The base document can be an open sales order or a planned/released production order if the *'MTO from production order'* option is enabled on the MTO tab of Produmex Manufacturing Settings. After selecting an item line, select the *'MTO Planning'* option from the right-click menu.

3. Top Order Picker for MTO Planning

A new form *'Top Order Picker for MTO Planning'* will be opened displaying the item on the selected line. The form also can be opened via the following path: MRP > Make to Order Scenario.

On the *'MTO Scenario field'* a specific MTO scenario name can be defined. The default name is: MTO_timestamp where timestamp is in yyyyMMddHHmmss.
Select line(s) by checking the box in 'Selected' column and click on the 'Add' button to create MTO planning for the selected document line(s). To select every line, click on 'Selected'.



The recommendations are always generated into a new scenario, and the recommendations cannot be added to an existing scenario. The add-on runs its extended MRP logic for the selected line(s), and the recommendations are generated into a new scenario with the name specified. The form *'Order Recommendations'* will be automatically opened for the scenario.

3.1. Combine MTO planning for multiple top orders

Other sales order and production order lines could be loaded into the 'Top Order Picker for MTO Planning' form to combine them.

Click on the 'Load Top Orders' button to load the orders. It is possible to filter the documents with the 'Item', 'Date From-To', 'Project' and 'Customer' fields.

- *Item*: Only load top order lines containing the item.
- *Date From- To*: Only load lines of top orders from the selected period.
- *Project*: Only load lines of top orders of the selected project.
- *Customer*: Only load lines of top orders for the selected customer.

To remove the top orders from the grid, click on the 'Clear' button.
To close the screen without any adjustments, click on the 'Cancel' button.

4. Creating Production and Purchase Orders from Recommendations

The extended MRP logic of the add-on creates the recommendations into a dedicated scenario that contains only the recommendations belonging to the selected document line(s).

Please note: The current stock is not taken into account for the complete requirements; a new recommendation is always created for items with MTO Planning.

On the 'Order recommendation' form recommended production and purchase orders with the scheduling are listed.

Values in white cells can be adjusted.

When the 'Allow MTO Order Type Change' option is set to true, the 'Order Type' column is displayed on the 'Order Recommendations' form. In this case the order type can be changed to: Purchase Order/ Production Order/ Purchase Request. Please note: Purchase Quotations and Inventory Transfer Requests are not yet supported in the MTO planning.

The following fields will be filled only if the 'Show Stock Information' option is set to true on the MTO tab of Produmex Manufacturing Settings:

- Available Quantity
- Committed Quantity
- In Stock Quantity
- Ordered Quantity

To create the actual production and purchase orders, select the line(s) and click on the 'Update' button. The MTO logic uses the *Lead Time* and *Tolerance Days* when scheduling. For each selected document line separate order recommendations will be created. It's not mandatory to create all orders immediately and in one step. The scenario containing the MTO recommendations can be opened later as well from the standard MRP module.

When all recommendations were processed into an MTO scenario, then the scenario might be deleted with the MRP wizard. To delete the scenario, select 'Delete Scenario …' from the right-click menu. It is not possible to delete recommendation lines for an MTO scenario.

To create grouped recommendations, select 'Group Recommendations for Scenario …' from the right-click menu.

4.1. Group Recommendations form

On the opening *'Group Recommendations'* form select the lines to group.

The recommendation selected first will be the primary recommendation. The following header fields will be filled based on the primary recommendation:

- *Primary Order Recommendation*: The recommendation number of the primary order.
- *Primary Order Type*: The type of the primary recommendation order.
- *Item*: The item code and description.
- *Vendor*: The card code and description of the vendor.
- *Grouped (Y/N)*: Indicates whether the recommendation is grouped or not.

- *Project*: The project code.
- *Warehouse*: The warehouse code.

After the primary order has been selected, only lines containing the same item can be added to the group. The primary recommendation can only be unselected with the ‘Unselect’ button.

The ‘Total Selected’ field shows the number of the selected lines and the ‘Total Quantity’ field displays the total ordered quantity on the selected lines.

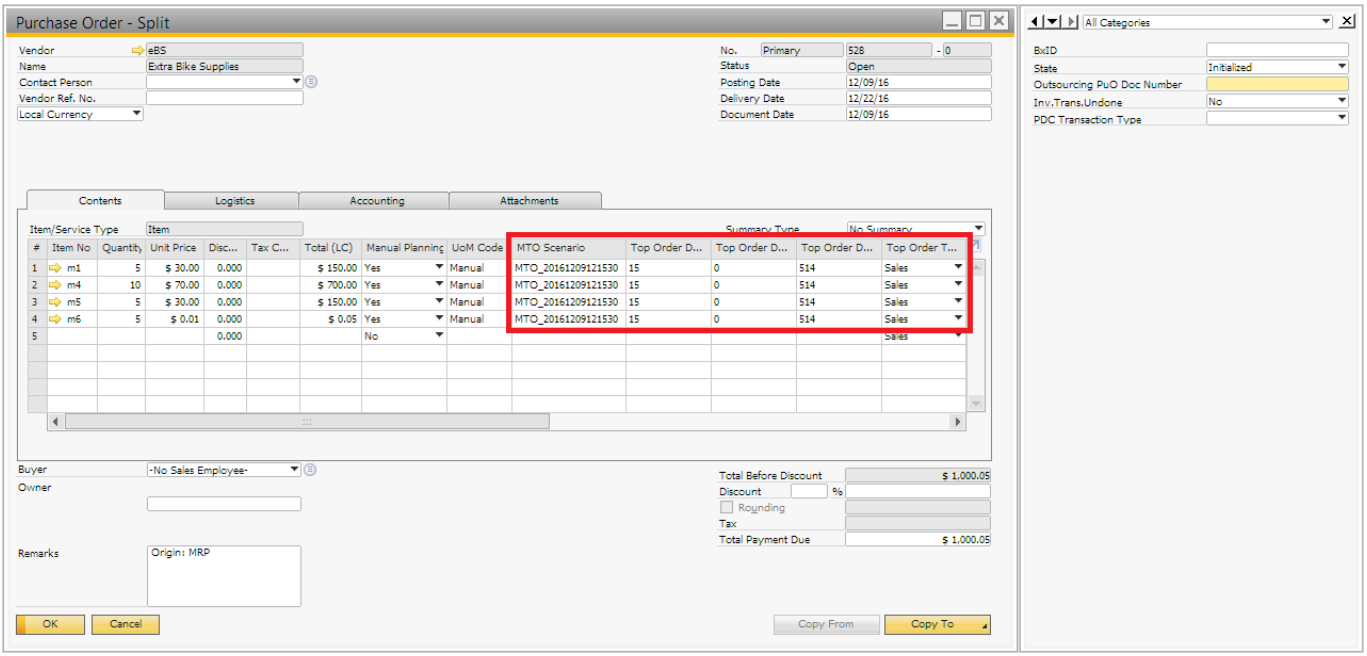
If the ‘Show Group Members’ option is ticked, grouped items are displayed in separate lines.

The ‘Group Days’ value defines the period length within order recommendations for the same item will be grouped with the Auto-Group function.

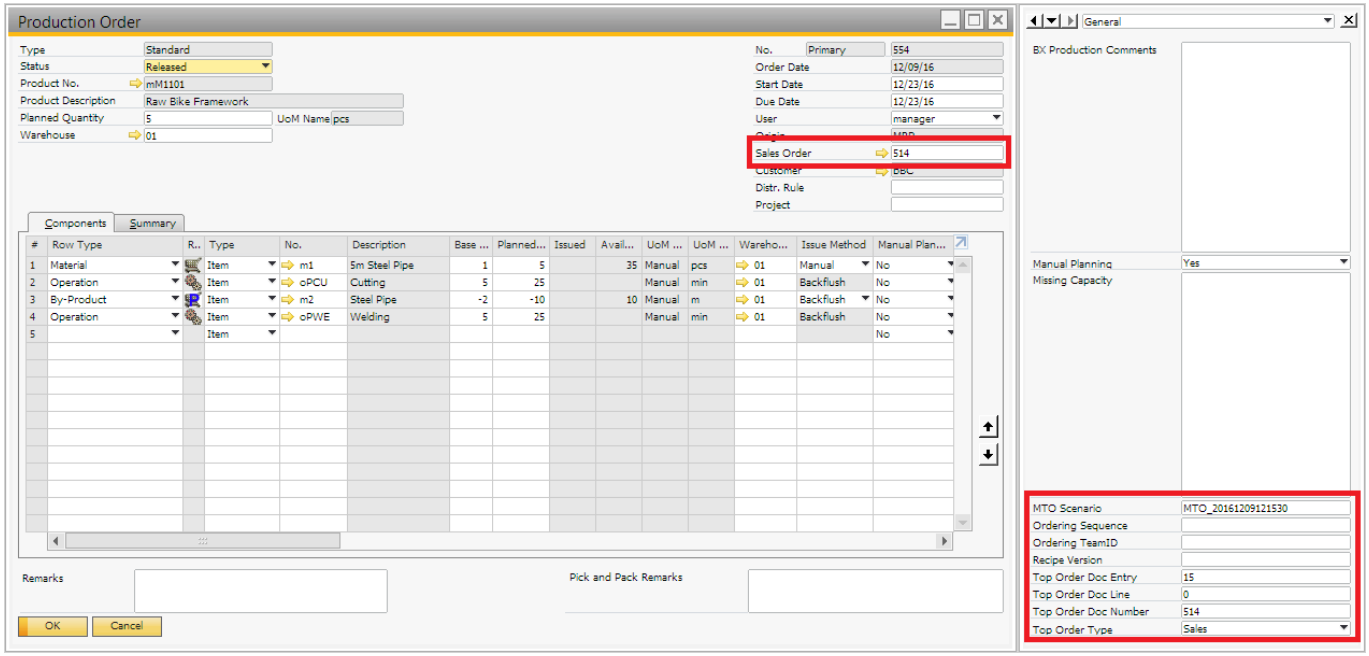
Click on the ‘Group’ button to group the selected lines. The lines that are grouped in this form will be grouped on the ‘Order Recommendation’ form too. To split grouped recommendations, select the recommendation and click on the ‘Ungroup’ button. To make every possible grouping within the period length defined in the ‘Group Days’ field, click on the ‘Auto-Group’ button.

5. Production and Purchase Orders Linked to Top Order Line

On purchase orders created from an MTO scenario the Manual Planning cell is set to ‘Yes’ and the MTO scenario name is added to the respective ‘MTO Scenario’ cell. The order type, the document number, the doc entry of the top order and the top order line is also added to the purchase order for reference.



When the top order is a sales order, the sales order number and the customer code is added to the production orders created from the MTO planning. The MTO scenario code and the top order details are displayed on the respective UDFs.

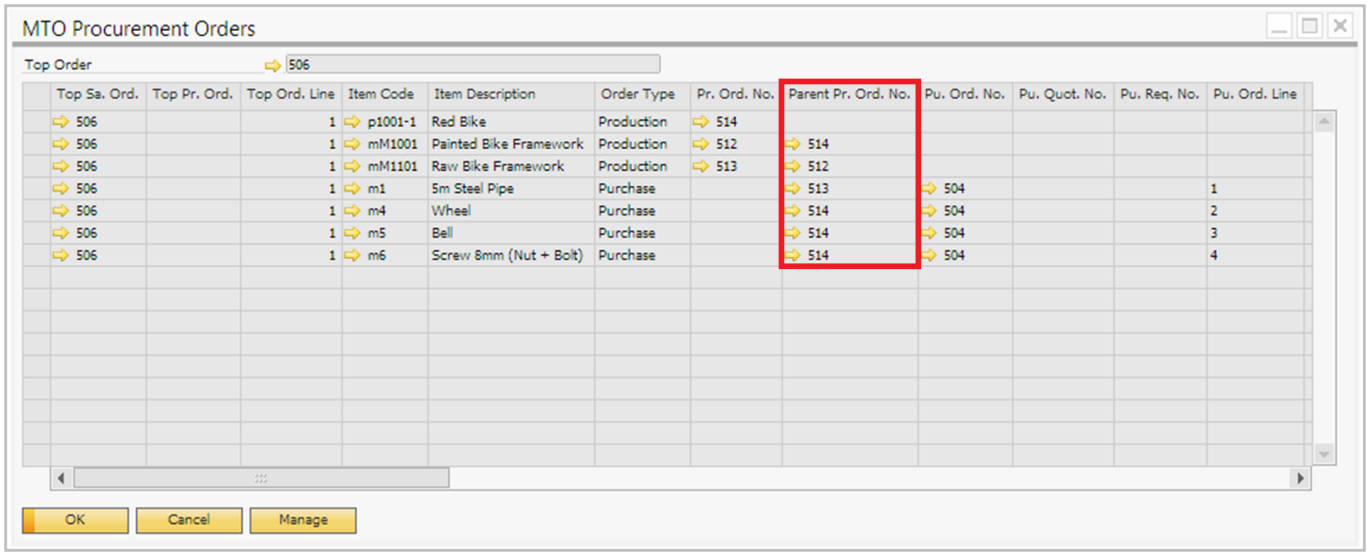


6. Changes on the top order

When reopening the base document, a couple of modifications can be seen. The name of the MTO scenario is written into the appropriate top order line and the Manual Planning cell is set to ‘Yes’. These are necessary because the Produmex Manufacturing regular MRP logic should skip the order lines that are handled by MTO planning.

7. MTO Procurement Orders

To overview the MTO Procurement orders created from a top order line, select the line on the top order then select ‘MTO Procurement Orders’ from the right-click menu. Every production and purchase orders linked to the selected top order line displayed. The order hierarchy, the significant dates and times, the order status and the completed quantity is shown on this form.

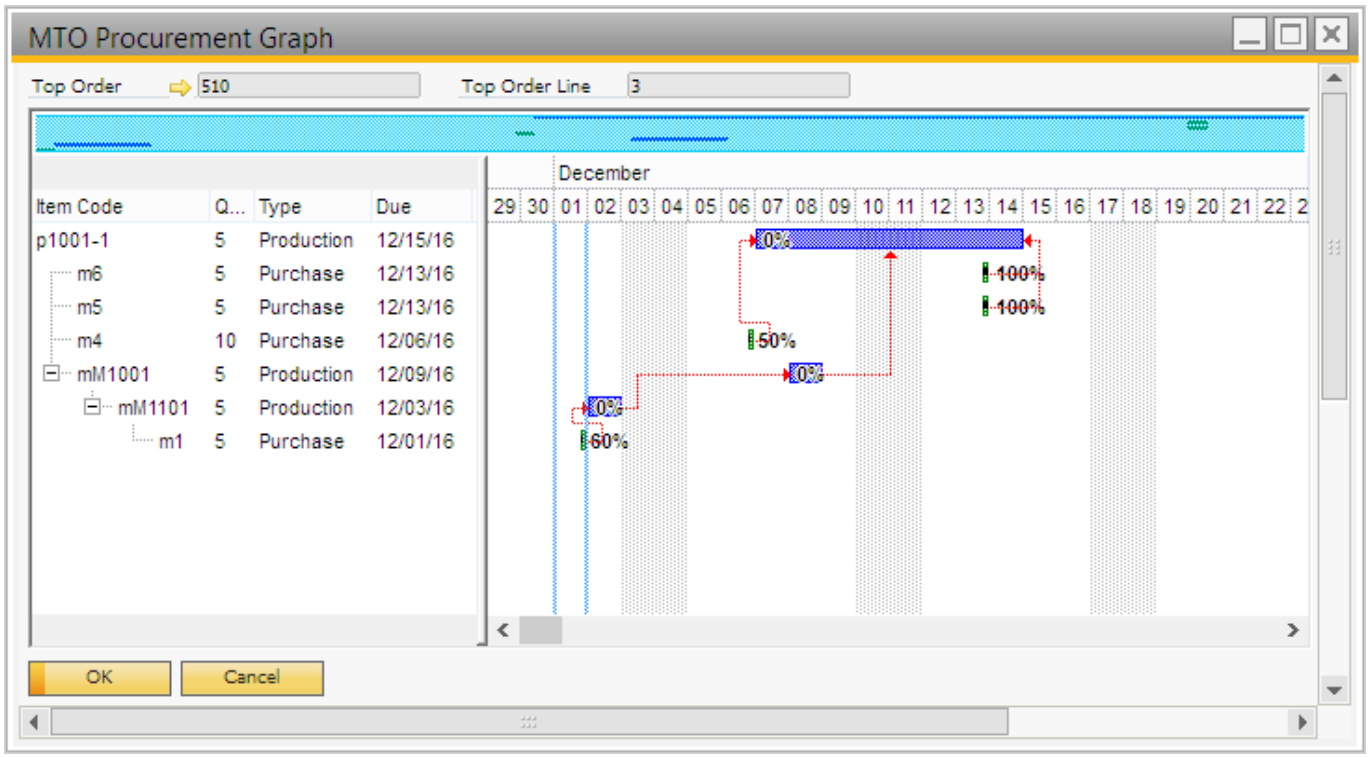


Click on the 'Manage' button to manage the production orders linked to the top order on the Production Management Cockpit.

8. MTO Procurement Graph

When we select the option MTO Procurement Graph in the right-click menu of a top order line, a form is opened that shows the timing of the production and purchase orders linked to the line. The diagram shows the hierarchies of the production and purchase orders as well.

On the left section, the order details (the item code of the ordered item, the ordered quantity, the order type and the due date) are shown as well as the order hierarchy. On the right section, bars display the planned duration of the orders. Next to the each bar, a completion percentage is displayed. The manufacturing sequence is indicated with red arrows.

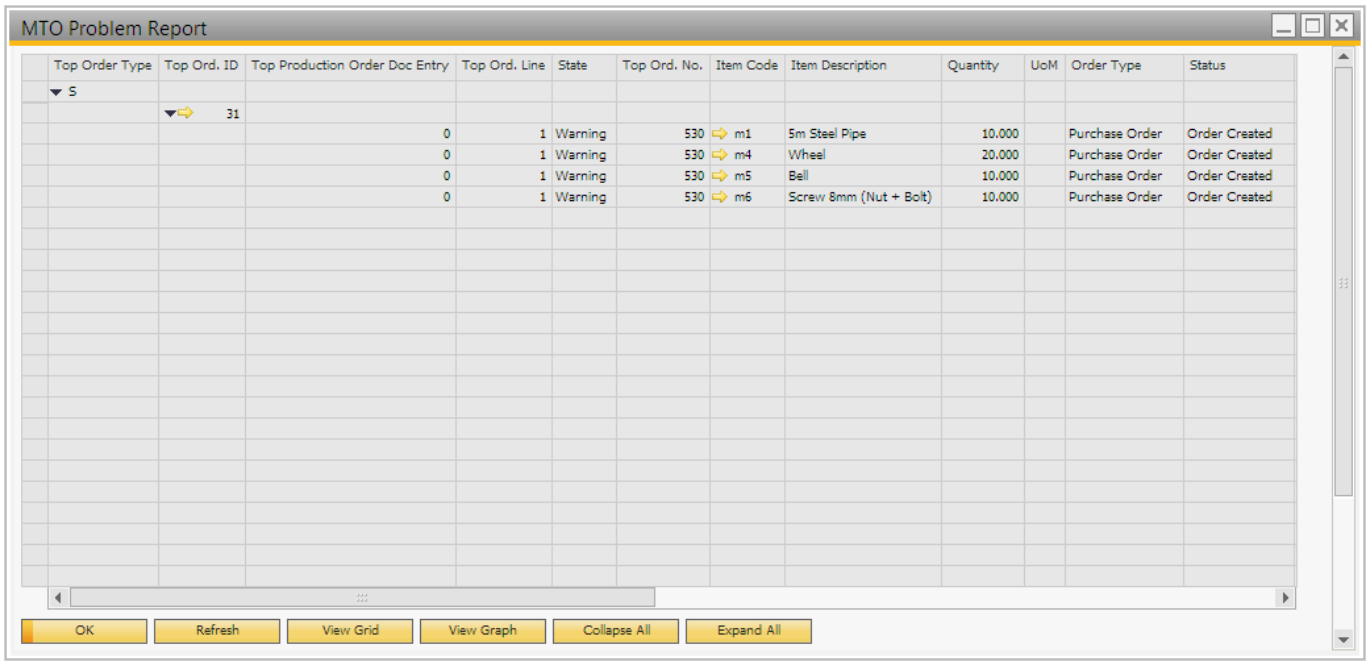


9. MTO Top Order References

To see the details of the referenced top order, select the 'MTO Top Order References' option from the right click menu on a created production or purchase order.

10. MTO Problem Report

Open the MTO Problem Report from the right click menu on the top order. Set the too early and too late thresholds for the MTO Report on the MTO Tab of Produmex Manufacturing Settings.



11. Reschedule MTO scenario

11.1. On the Production Management Cockpit

When the 'Move Earliest' and/or the 'Move Latest' setting is enabled on the MTO Tab of the Produmex Manufacturing Settings, the production orders linked to the MTO chain can be rescheduled based on the earliest or latest start date of the top order on the Production Management Cockpit.

12.2. On the Job Scheduling Control Panel

On the Job Scheduling Control Panel operations can be rescheduled manually. When the 'Auto Roll child MTOs' option is enabled on the MTO tab of Produmex Manufacturing settings, the child production orders that have the 'Is Auto Roll' UDF set to 'Yes' are automatically reallocated if the parent MTO is rescheduled if the *Allocation Strategy* of the production orders is 'Back from Due Date'.

The due date of the child production order will be aligned to the begin date of the parent order.

11.2.1. Discrepancy

To highlight the production orders belonging to the MTO scenario, select the scenario from a list on the header next to the MTO scenario. The list of the procurement orders of the selected MTO can be opened by clicking on the yellow arrow. The 'MTO Procurement Orders' form will open.

The order sequence is displayed with arrows. Red arrows indicate discrepancies. The discrepancy messages are shown on the bottom section on the form. Double click on the message to highlight the arrow showing the discrepancy.

Discrepancies can be corrected manually or by using the ‘Reallocate allocations’ function. For more information about this function please see: 3.2. Rescheduling.

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