Fulfil Manufacturing/Production Terminology

Manufacturing overview

Fulfil manufacturing module allows modern merchants to

- Integrate manufacturing workflows from sales orders to fulfillment and labor costing
- Manage multiple fulfillment strategies (make on order, make to stock)
- Enable floor staff and operators to collaborate over the production app

Learn more about:

- Bill of materials
- BOM Substitution and Nested BOMs
- Routing

If you are new to the manufacturing module, we recommend reading

- Fulfil's terminology

If you are ready to create your first production order, learn about:

- Creating production orders
- Managing production requests

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Supported strategies

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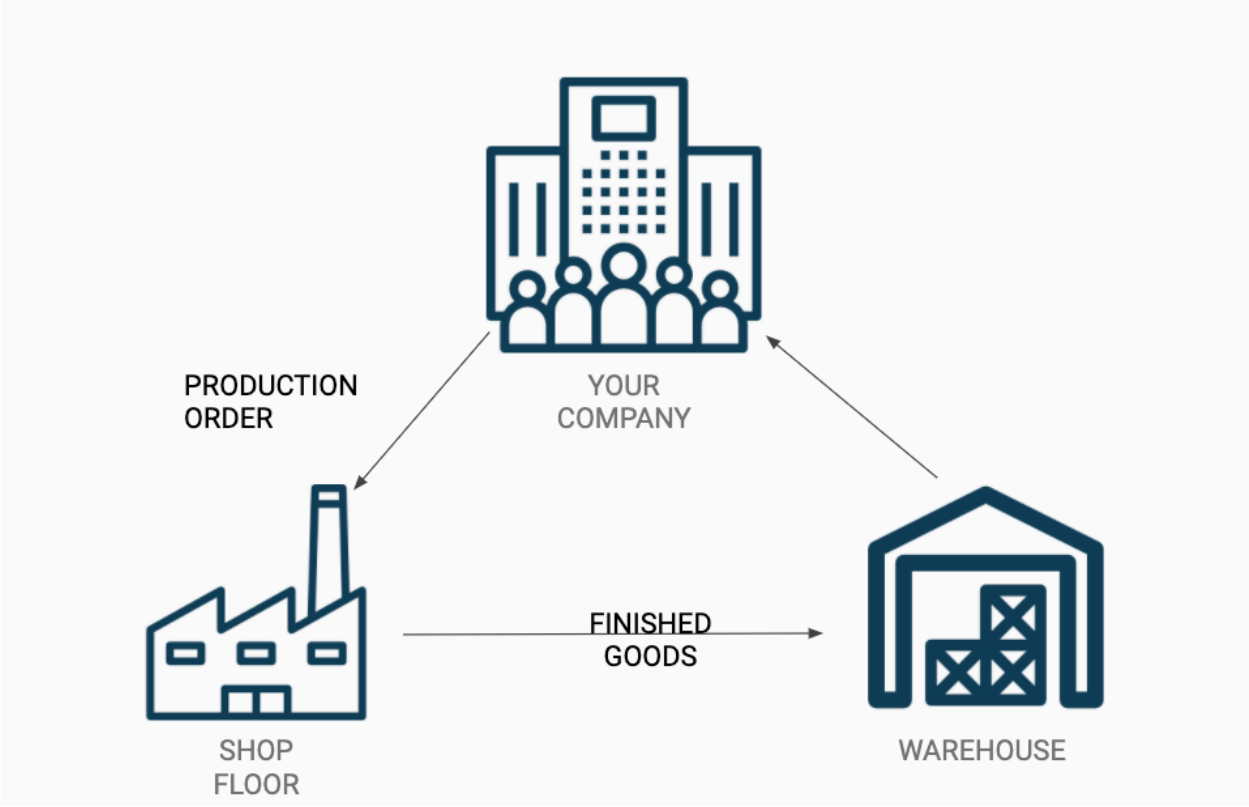
Make to Stock

Make to stock (MTS) is commonly a push-based production strategy used by Merchants to produce inventory to cover anticipated consumer demand. The Merchants manufacture based on forecasts or minimum stock thresholds (the latter is typically calculated based on forecasts or historical consumption data). The MTS approach is applicable when the production occurs in-house and requires advanced

planning. MTS can also be a pull-based strategy for large customer orders that require bulk manufacturing to fulfil.



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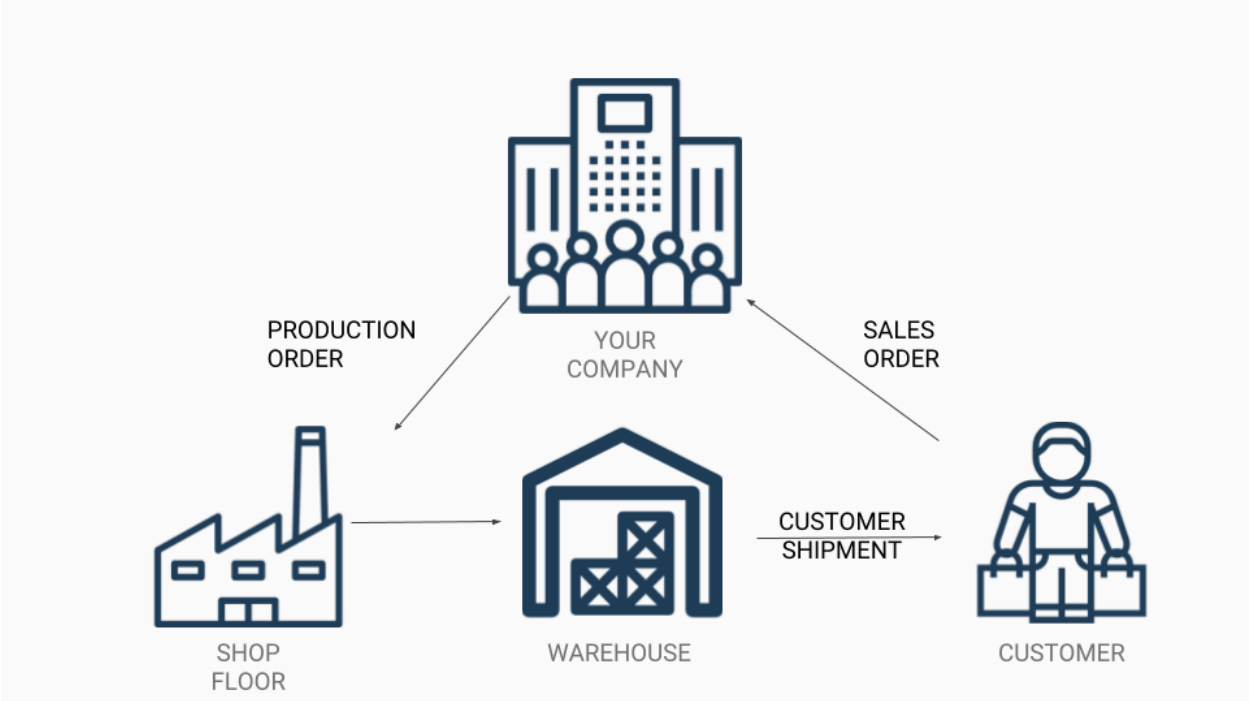
Make to Order

Make to order (MTO), or made to order, is a pull-based production strategy that allows your customers to purchase products customized to their specifications. Such a manufacturing process only starts when there is a confirmed order received from your customer. A production order is required as there are specific routing/manufacturing steps necessary to produce these items.



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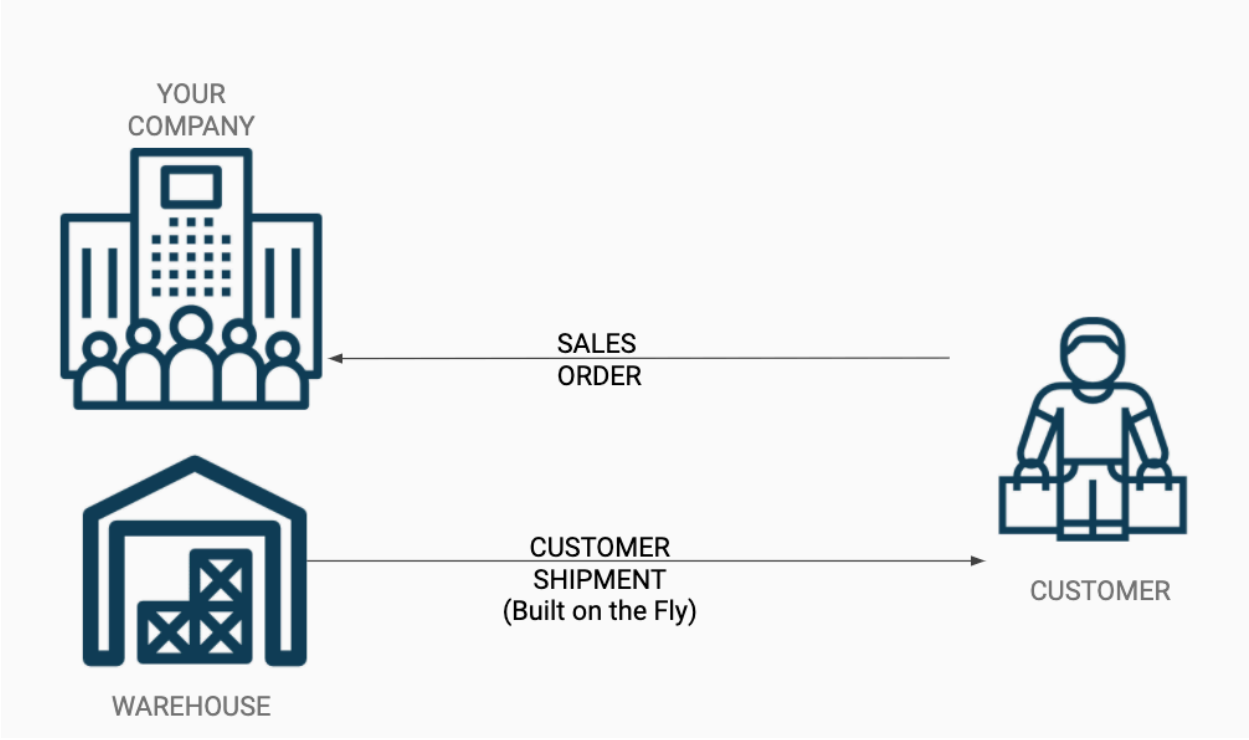
On the fly assembly

Built on the Fly assembly is a pull-based production strategy used for bundle or Kits. These items are usually not bundled and pre-stocked in the warehouse; they are picked/assembled by warehouse staff on the fly for customer orders.

In Fulfil, such bundle products also have a BOM associated with them, and these BOMs are tagged as built on the fly. When a customer places an order for a bundle, Fulfil explodes the BOM on the shipment and allocates the inventory of the BOM sub-items.

note

Production orders are **not created** for on the fly assembly items. Instead they are part of the shipping and fulfillment module. The items to pick as part of the assembly appears in the pick ticket.



Production module Terminology

This article explains the terminology used in the production module in Fulfil.

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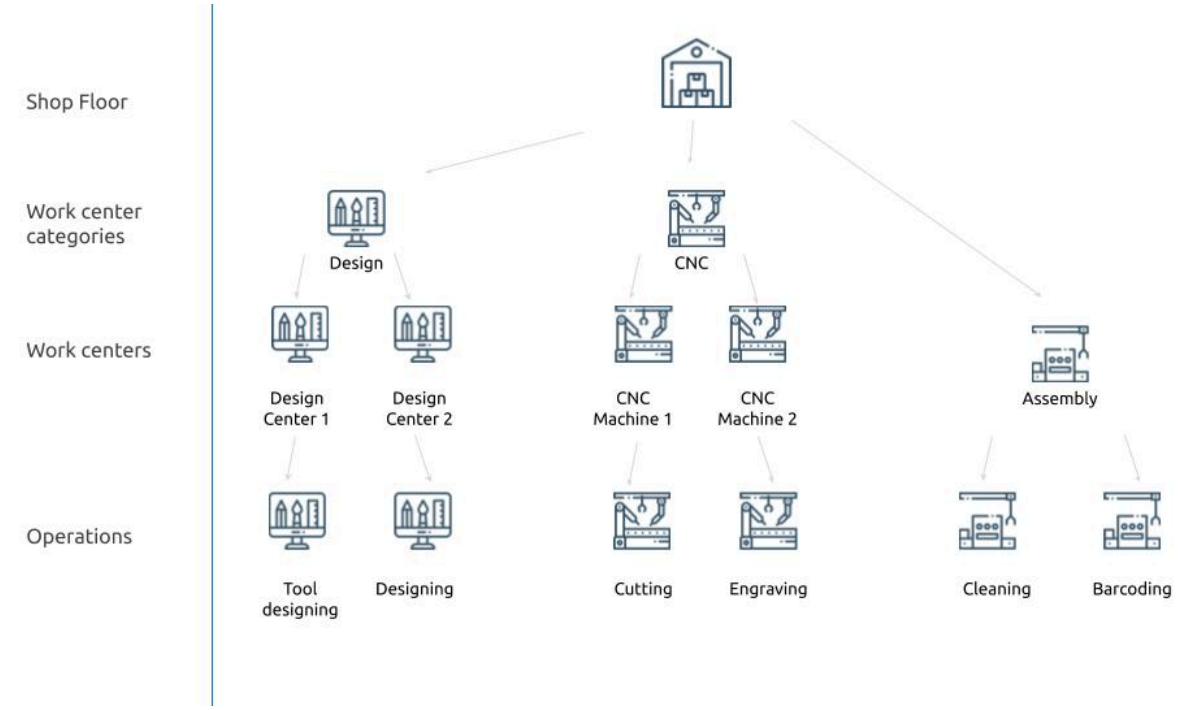
Work Center Categories

Manufacturing shop floors typically have distinct work areas where related production activities take place. Here is an illustration of the manufacturing shop floor and the areas within the shop floor.



Work center categories function to group multiple work centers used to complete the same operations set. Typical examples are Design, Machining, Heat Treating, Assembly, and QA.

Work center categories are required when defining operations. For example, operation Engraving can only occur in a work center that belongs to the category CNC.

The categories are used by the production order to allocate a work center to the work orders automatically.

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Work Centers

Work centers are specific production units that consist of people or equipment. They can represent the piece of equipment used in a manufacturing operation or for general labor, the area where the work will occur. For example, if you have two CNC machines in your shop floor, then the CNC machine 1 and 2 are the individual work centers and the work happening on these machines are the operations. For general labor, assembly is the work center, and the specific assembly tasks are the operations.

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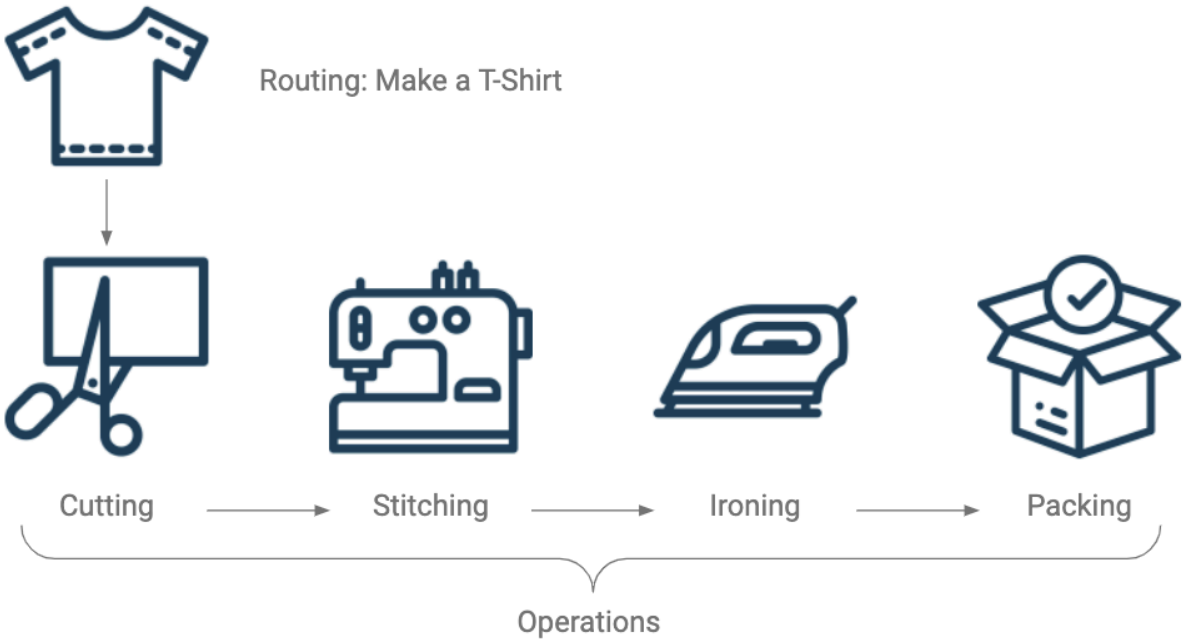
Routing and Operation

Routings (in manufacturing) specifies a set of operations (steps) taken to manufacture a product. Routing steps are an ordered list of tasks required for a manufacturing process. For example, to produce a T-Shirt, the operations are Cutting, Stitching, Ironing, and Packing. The combination of these steps, in order, create a routing. Multiple products can have the same routing, as the steps to manufacture different types of T-shirts can be the same.



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Bill of Materials (BOM)

A Bill of Materials (BOM) represents the structure of a product as a list of raw materials or subassemblies and the quantities of each needed to manufacture the product.

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Routing/Bill of Operations (BOO)

Routings (in manufacturing) specifies the steps that are used to manufacture a product. Routing steps are an ordered list of tasks required for a manufacturing process.

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Work Centre

Work centers represent the piece of equipment that will be used in a manufacturing operation or the manual resource that will perform a specific task.

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Operation

An operation is a procedure performed at a work center. Examples are "cutting", "stitching", "ironing", "Packing" and "Testing". When the operation is used in a routing, it becomes a routing step and when the routing is used in a production order, it becomes a work order.

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Production Order/Manufacturing Order (MO)

A production order is a control document issued by a company to produce a specific quantity of material. The order also indicates the items needed to produce the specific quantity and the steps required to produce it.

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Work Order (WO)

A work order is a sub control document of a production order (MO) outlining a specific step in the manufacturing process. An example would be “Machining” of a tool within a larger production order to make a tool.

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Nested BOMs

Nested BOMs are BOMs which use another BOM product as its production input. For example, you can have a BOM which produces a pack of two Rubik's Cubes while using another BOM as its input for just a single Rubik's Cube.

Work Orders

A manufacturing order can have one or more work orders, depending on the routing steps required to complete the production process.

In Fulfil, you can view work orders by navigating to **Production > Work Orders** in the left-side menu.

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Work Order Fields

Field	Description
Number	Unique identifier for the work order.
Type	Indicates if the work order is "Insourced" (performed internally) or "Outsourced" (performed by a supplier).
Operation	The manufacturing operation to be performed.
Production	The associated production order.
Work Center Category	The category of work centers that can perform the operation.
Work Center	The specific work center where the operation will be performed.

Priority	The priority level of the work order (Highest, High, Normal, Low, Lowest).
Operator	The employee assigned to perform the work.
Planned Date	The scheduled date for the work order.
Quantity Done	The amount of work completed.
Cost	Total cost of the work order.

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Additional Fields for Outsourced Work

When the work order is "Outsourced," these additional fields are available:

Field	Description
Supplier	The vendor performing the outsourced work.

Service	The purchased service from the supplier.
Quantity	The amount of service to purchase for one production unit.
Unit Price	Cost per unit of the outsourced service.
Currency	The currency used for the outsourced service pricing.

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Work Order States

State	Description
Draft	The initial state when the work order is created; no

	action has been taken yet.
Waiting	Work cycles are created but not yet started.
Running	At least one work cycle has started.
Finished	All work cycles tied to the work order are completed
	or canceled.
Done	All operations on the work order are completed, and no
	further cycles can be started.

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Work Cycles

Work orders are executed through **work cycles**, each representing a discrete period of work. Work cycles track:

- The operator performing the work
- Start time and duration
- Quantity completed and scrapped
- Associated costs

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Managing Work Cycles

1. **Starting a Cycle**
    - Use the "Start New Cycle" button to begin a work cycle.
    - Assign an operator (either the work order's operator or the current user's employee record).
    - Specify the work center for the cycle.
2. **Completing a Cycle**
    - Use the "Complete Cycle" button to finish a running cycle.
    - Record the duration and quantities (completed and scrapped).
    - The cost is calculated based on the work center's cost rate and duration.
3. **Finishing All Cycles**
    - Use the "Finish All Cycles" button to complete all active work cycles for the
      work order.

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Other Features

- Work orders support bulk editing for certain fields, like operator assignments.
- **Outsourced Work Orders**: Purchase orders can be generated automatically.
- **Start Ahead**: Some operations allow starting a work order ahead of prior steps (`start_ahead` flag).
- **Labor Cost Tracking**: The system calculates labor costs using work center rates and cycle durations.

Closing a production order (short)

Running production orders can be closed mid-way depending if the production inputs can be reused.

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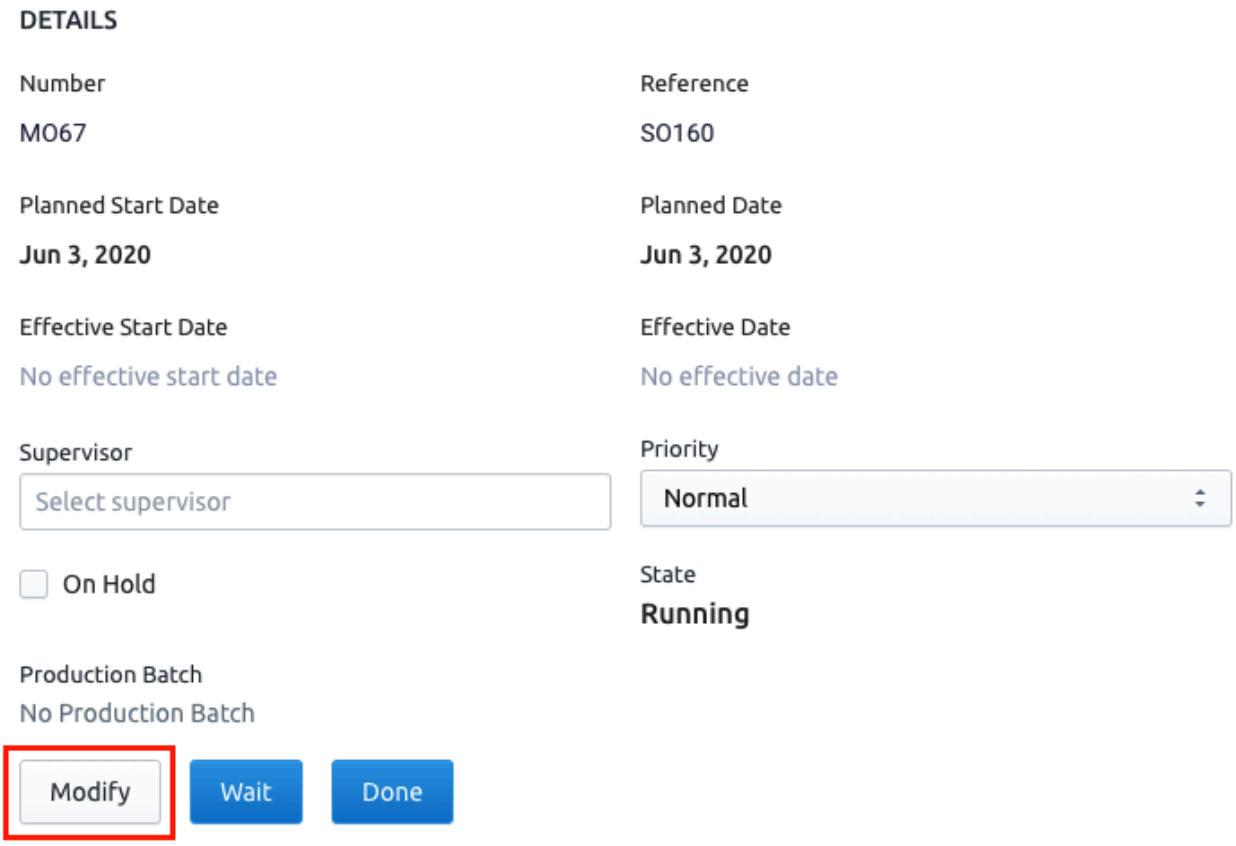
Closing production

Click on the **Modify** wizard from the production order page.



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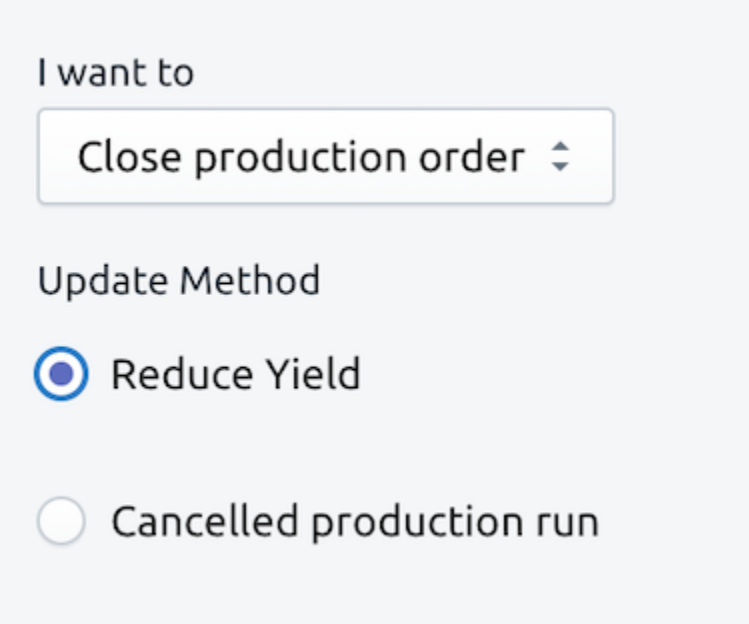
Reducing the production yield

This option is helpful if the production inputs have been physically consumed and cannot be re-used and the output is limited to what has already been produced.

1. Select **Close production order** and **Reduce Yield**.



2. Clicking on **Next** at the bottom of the page will complete the cancelation.

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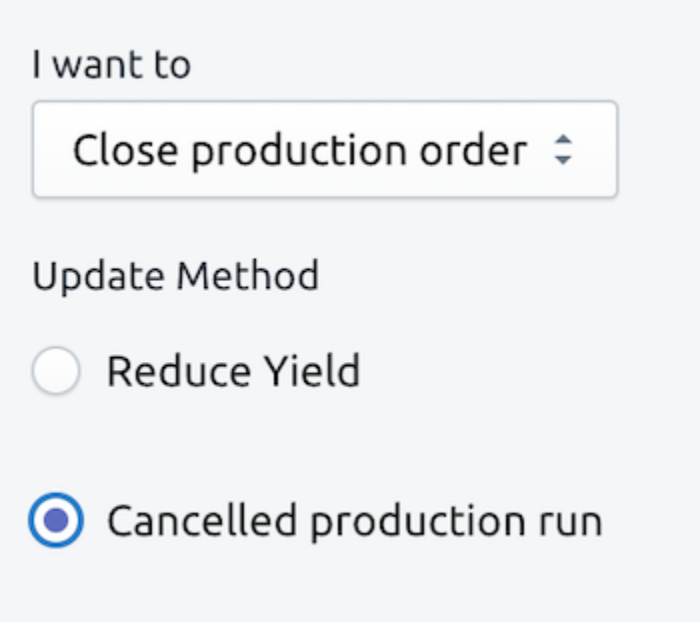
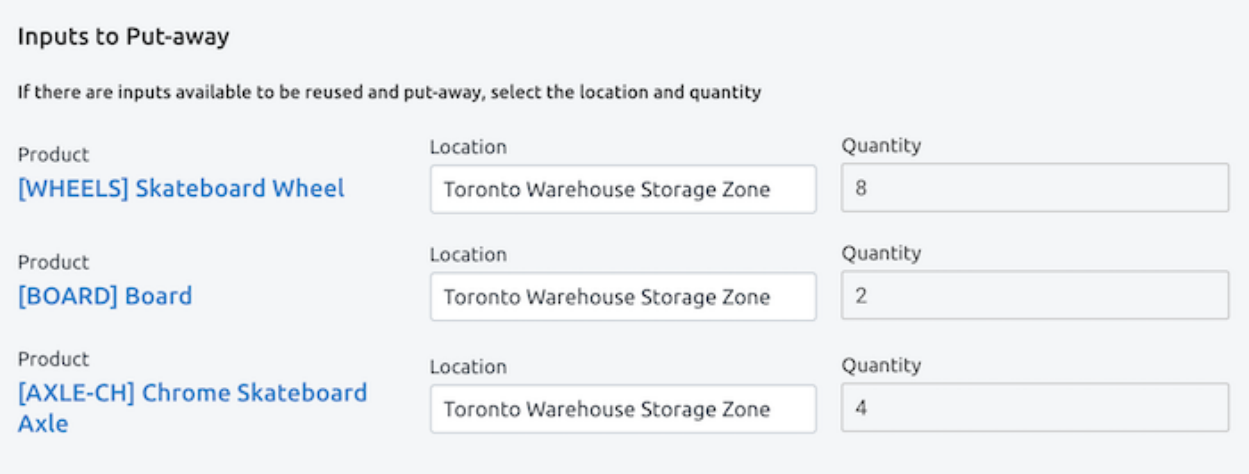
Canceling incomplete production run

This option assists merchants in closing the production order when there is a remaining balance (for example, 100 units requested, 95 units produced, 5 remaining to be completed), while allowing putting away any unused raw materials. Any outputs already produced are retained as done.

1. Select **Close production order** and **Canceled production run**.



2. Click on **Next** at the bottom of the page to proceed.
3. Choose the input products and quantity that can be reused along with the location to putaway the inventory. Fulfil estimates the quantity based on the BOM and quantity canceled.



4. Click on **Complete** to complete the cancelation.

Partial reusable inventory

You can select certain products and partial quantities if not all of the production inputs are reusable.