Make-to-Stock Production – Discrete Industry

SAP Best Practices
Purpose, Benefits, and Key Process Steps

**Purpose**
- This scenario describes a business process, which is typical for companies with lot-size oriented production.
- The production scenario produces a finished good and all dependent components in make-to-stock production (MTS).
- Furthermore, the scenario is supported by the main cost object controlling functions required, such as preliminary costing and period-end closing.

**Benefits**
- Production triggered by a production plan
- Serial number and batch management included
- Optional with: quality management, consigned inventory, external processing

**Key Process Steps**
- Creating Planned Independent Requirements
- Material Requirements Planning at Plant Level
- In-House Production (subassembly)
- In-House final assembly (Finished Good)
- Capacity Leveling
- Confirming Assembly Activities
Required SAP Applications and Company Roles

Required SAP Applications
• Enhancement package 5 for SAP ERP 6.0

Company Roles
• Production Planner
• Production Supervisor
• Shop Floor Specialist
• Warehouse Clerk
• Strategic Planner
• Engineering Specialist
Detailed Process Description

Make-to-Stock Production – Discrete Industry

This scenario describes a business process, which is typical for companies with lot size oriented production. The production scenarios consist of both goods movements (goods issues and receipts) and confirmation of completion of the production order.

- Furthermore, the scenario is supported by the main cost object controlling functions required, such as preliminary costing and period-end closing.
- The typical planning process starts with sales quantity planning. The previous period’s actual sales figures can be used as a basis for future planning.
- In Sales and Operations Planning, you ensure that production stays in line with sales so that you may create the production plan synchronously to sales. The planning data is transferred from Sales and Operations Planning to Demand Management. Demand Management generates independent requirements, which are used in the subsequent Material Requirements Planning (MRP) run.
- In material requirements planning, the bill of materials (BOM) for the top-level material demand gets exploded and production is planned right down to procured component level. MRP results in planned orders being generated for the material to be produced.
- If insufficient warehouse stock is available, purchase requisitions are created for the raw materials required. When the order is created, target costs are calculated for the order lot size (preliminary costing).
- During the production process, costs incurred are updated on the order, which enables you to keep track of and compare target costs and actual costs at any time.
- Period-end-closing activities are applied to the order. This includes Work In Progress calculation and variance calculation.
- After this, Work in Progress is settled to financial accounting and production variances are settled to management and financial accounting.
Process Flow Diagram
Make-to-Stock Production – Discrete Industry
Process Flow Diagram
Make-to-Stock Production – Discrete Industry

1. Review Operation List
## Legend

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Usage Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band:</td>
<td>Identifies a user role, such as Accounts Payable Clerk or Sales Representative. This band can also identify an organization unit or group, rather than a specific role. The other process flow symbols in this table go into these rows. You have as many rows as required to cover all of the roles in the scenario.</td>
<td>Role band contains tasks common to that role.</td>
</tr>
<tr>
<td>External to SAP</td>
<td>External Events: Contains events that start or end the scenario, or influence the course of events in the scenario.</td>
<td></td>
</tr>
<tr>
<td>Flow line (solid):</td>
<td>Flow line indicates the normal sequence of steps and direction of flow in the scenario. Flow line (dashed):</td>
<td>Connects two tasks in a scenario process or a non-step event</td>
</tr>
<tr>
<td>Business Activity / Event</td>
<td>Business Activity / Event: Identifies an action that either leads into or out of the scenario, or an outside Process that happens during the scenario</td>
<td>Does not correspond to a task step in the document</td>
</tr>
<tr>
<td>Unit Process</td>
<td>Unit Process: Identifies a task that is covered in a step-by-step manner in the scenario</td>
<td>Corresponds to a task step in the document</td>
</tr>
<tr>
<td>Process Reference</td>
<td>Process Reference: If the scenario references another scenario in total, put the scenario number and name here.</td>
<td>Corresponds to a task step in the document</td>
</tr>
<tr>
<td>Sub-Process Reference</td>
<td>Sub-Process Reference: If the scenario references another scenario in part, put the scenario number, name, and the step numbers from that scenario here</td>
<td>Corresponds to a task step in the document</td>
</tr>
<tr>
<td>Process Decision</td>
<td>Process Decision: Identifies a decision / branching point, signifying a choice to be made by the end user. Lines represent different choices emerging from different parts of the diamond.</td>
<td>Does not usually correspond to a task step in the document; Reflects a choice to be made after step execution</td>
</tr>
<tr>
<td>Symbol</td>
<td>Description</td>
<td>Usage Comments</td>
</tr>
<tr>
<td>Diagram Connection</td>
<td>To next / From last Diagram: Leads to the next / previous page of the Diagram</td>
<td>Flow chart continues on the next / previous page</td>
</tr>
<tr>
<td>Hardcopy / Document</td>
<td>Hardcopy / Document: Identifies a printed document, report, or form</td>
<td>Does not correspond to a task step in a document; instead, it is used to reflect a document generated by a task step; this shape does not have any outgoing flow lines</td>
</tr>
<tr>
<td>Financial Actuals</td>
<td>Financial Actuals: Indicates a financial posting document</td>
<td>Does not correspond to a task step in a document; instead, it is used to reflect a document generated by a task step; this shape does not have any outgoing flow lines</td>
</tr>
<tr>
<td>Budget Planning</td>
<td>Budget Planning: Indicates a budget planning document</td>
<td>Does not correspond to a task step in a document; instead, it is used to reflect a document generated by a task step; this shape does not have any outgoing flow lines</td>
</tr>
<tr>
<td>Manual Process</td>
<td>Manual Process: Covers a task that is manually done</td>
<td>Does not generally correspond to a task step in a document; instead, it is used to reflect a task that is manually performed, such as unloading a truck in the warehouse, which affects the process flow.</td>
</tr>
<tr>
<td>Existing Version / Data</td>
<td>Existing Version / Data: This block covers data that feeds in from an external process</td>
<td>Does not generally correspond to a task step in a document; instead, this shape reflects data coming from an external source; this step does not have any incoming flow lines</td>
</tr>
<tr>
<td>System Pass / Fail Decision</td>
<td>System Pass / Fail Decision: This block covers an automatic decision made by the software</td>
<td>Does not generally correspond to a task step in the document; instead it is used to reflect an automatic decision by the system that is made after a step has been executed.</td>
</tr>
</tbody>
</table>
Materials Requirement Planning - MRP

- Planned Order
- Dependent Reqmts
- Reservations
- Production Order
- Material Reqmts Planning
- Planned Ind. Requirements
- Convert
- Warehouse
## Alternative Planning Strategies for Finished Product

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Net Requirements Planning (10)</th>
<th>Planning with Final Assembly (40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer requirements passed on to production</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>This means . . .</td>
<td>... sales orders do not influence production</td>
<td>... sales orders that exceed planned independent requirements can influence production</td>
</tr>
<tr>
<td></td>
<td>... the main objective is to ensure smooth production</td>
<td>... the most important factor here is the ability to react flexibly to customer demand</td>
</tr>
<tr>
<td>Planned independent requirements allocated and reduced during sales order processing</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Planned independent requirements reduced at goods issue for delivery</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Work Center

Work Center: Assembly

- Default values Routings
- Costing Data
- Sched. Data Capacity Data

- Routings
- Costing
- Scheduling & Capacity

Default values:
- Routings
- Costing
- Scheduling & Capacity

Costing Data:
- 1010,-
- 2150,-
- 3160,-
Routing Work Center / Operation

Routing Header

Operation 10: Final Assembly

Material Components

Work center
Control key
Standard values
Activity types
Description
Planned Order Conversion

- Individual Conversion
  - Planned orders → Production order

- Collective Conversion
  - Planned orders → Production orders
Production Order Creation

- Specify order type
- Define order item
- Copy routing
- Lead time scheduling
- Copy bill of material
- Availability check
- Optional changes
- Save production order

Optional (Customizing)
Production Order Processing

Order proposal (planned order)

Order creation

Availability check

Order release and batch determination for components

Order settlement

Goods receipt

Confirmations

Material withdrawal

Order header

Operations

Components

Costs
Goods Movement

Warehouse

Material

Goods movement

Prod. order

Operation

Mat. comp.

Costs

Material document

Accounting document

→ Update of stock quantities
→ Update of stock values
→ materials can be batch controlled
Goods Issue

- Updating stock quantities
- Updating stock values
- Reducing reservations
- Calculating actual costs and updating the order
Production Order Confirmations

Order confirmation

Manual entry

Operation 0010
Operation 0020
Operation 0030
Operation . . . .

Production order
Production Order - Preliminary Costing

- **Material components**
  - Ind. "Rel. to costing"
  - Price

- **Order type / Plant**
  - Costing variant

- **Display planned/actual costs**
  - Cost elements
  - Cost itemization
  - Cost component split

- **Planned costs**
  - Material costs
  - Costs for external procurement
  - Production costs
  - Material overhead costs
  - Production overhead costs
  - Costs for external processing

- **Phases**
  - Gen. operation values
  - Standard values
  - Control key “costing indicator”

- **Resources**
  - Formula key for costing
  - Cost center
  - Activity type
  - Formula constants

- **Cost calculation log**
Cost of Production Order

Material components
- Quantities
- Prices

Operation
- Work center
- Standard value
- Quantities

Work center
- Cost center
- Activity types
- Formulas

Cost center
- Activity types
- Periods

Material costs

Internal activities costs

Overhead calculations

Production order cost
WIP and Variance Calculation in Lot-Based Cost Object Controlling

Pre-Released or Released

Partially Delivered

Finally Delivered or Technically Completed

Actual Costs

WIP at Actual Costs

Delivery Value

WIP at Actual Costs

Variance
Settlement of Order (Example)

Product cost planning
Lot size 1 PC

Material 600
Surcharge 300
Production 1100

Material Master
Standard Price = 2000

Material 600
Surcharge 300
Production 1100

Material Master
Standard Price = 2000

Production Order
Mat. F126

Actual Cost

| Material  | 800  |
| Production| 1.200 |
| Surcharge | 400  |
| GR        | 2.400 |
| Variances | -2.000 |
| 400       |

Financial Accounting

Warehouse 2000
Price difference 400

Settlement

Price difference

Price 150
Qty 150
Structure 100
Scrap 0
Lot size 0

Settlement of Order (Example)