

SAP Manufacturing Execution

How-To Guide



How To Set Up and Use Products in SAP ME

Applicable Release: ME 15.1

Version 2.0

22th 12, 2015

SAP ME How-To-Guide for Setting up Products

© Copyright 2012 SAP AG. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG. The information contained herein may be changed without prior notice.

Some software products marketed by SAP AG and its distributors contain proprietary software components of other software vendors.

Microsoft, Windows, Outlook, and PowerPoint are registered trademarks of Microsoft Corporation.

IBM, DB2, DB2 Universal Database, OS/2, Parallel Sysplex, MVS/ESA, AIX, S/390, AS/400, OS/390, OS/400, iSeries, pSeries, xSeries, zSeries, z/OS, AFP, Intelligent Miner, WebSphere, Netfinity, Tivoli, Informix, i5/OS, POWER, POWER5, OpenPower and PowerPC are trademarks or registered trademarks of IBM Corporation.

Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Oracle is a registered trademark of Oracle Corporation.

UNIX, X/Open, OSF/1, and Motif are registered trademarks of the Open Group.

Citrix, ICA, Program Neighborhood, MetaFrame, WinFrame, VideoFrame, and MultiWin are trademarks or registered trademarks of Citrix Systems, Inc.

HTML, XML, XHTML and W3C are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Massachusetts Institute of Technology.

Java is a registered trademark of Sun Microsystems, Inc.

JavaScript is a registered trademark of Sun Microsystems, Inc., used under license for technology invented and implemented by Netscape.

MaxDB is a trademark of MySQL AB, Sweden.

SAP, R/3, mySAP, mySAP.com, xApps, xApp, SAP NetWeaver, and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP AG in Germany and in several other countries all over the world. All other product and service names mentioned are the trademarks of their respective companies. Data contained in this document serves

informational purposes only. National product specifications may vary.

These materials are subject to change without notice. These materials are provided by SAP AG and its affiliated companies ("SAP Group") for informational purposes only, without representation or warranty of any kind, and SAP Group shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP Group products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

These materials are provided "as is" without a warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement.

SAP shall not be liable for damages of any kind including without limitation direct, special, indirect, or consequential damages that may result from the use of these materials.

SAP does not warrant the accuracy or completeness of the information, text, graphics, links or other materials contained within these materials. SAP has no control over the information that you may access through the use of hot links contained in these materials and does not endorse your use of third party web pages nor provide any warranty whatsoever relating to third party web pages.

SAP ME "How-to" Guides are intended to simplify the product implementation. While specific product features and procedures typically are explained in a practical business context, it is not implied that those features and procedures are the only approach in solving a specific business problem using SAP ME. Should you wish to receive additional information, clarification or support, please refer to SAP Consulting.

Document History

Document Version	Description	Author
1.0	Initial version	Chet Moutrie
2.0	Updated for Creating Carriers and using them on the POD	Faye Wang

SAP ME How-To-Guide for Setting up Products

--	--	--

Table of Contents

1.1 Purpose.....	7
1.2 Scope.....	7
1.3 Glossary	7
2.1 Description and Applicability	8
2.1.1 Why Set Up Products?	8
2.1.2 Decisions to Make.....	8
2.1.3 Setting Up Products and Components.....	9
2.2 Business Purposes / Functions.....	9
3.1 Defining Products and Components	9
3.1.1 Working with Materials	9
3.1.1.1 What Is a Parent?.....	9
3.1.1.2 What Is a Component?.....	9
3.1.1.3 What Is an Alternate Component?	10
3.1.1.4 What Is an Assembly?	10
3.1.1.5 What Is a Material?	10
3.1.2 Working with Lots and Panels.....	10
3.1.2.1 What Is a Lot?	10
3.1.2.2 What Is a Panel?	11
3.1.2.3 Creating Panel Records.....	11
3.1.3 Creating Trackable SFCs.....	11
3.1.4 Assigning Routings to Materials.....	11
3.1.5 Component Usage Control	12
3.1.7 Activity Hooks.....	12
3.1.8 Using the Vendor Feature.....	12
3.1.9 Placing Components into Inventory.....	12
3.1.9.1 Adding Manufactured Materials to Inventory Automatically	12
3.1.9.2 Adding Purchased Components to Inventory Manually	13
3.1.9.3 Adding Purchased Components to Inventory.....	13

SAP ME How-To-Guide for Setting up Products

3.2 Collecting Information.....	13
3.2.1 What Is a Data Type?	13
3.2.2 Assigning Assembly Data Types to Materials	13
3.2.2.1 Identifying Field.....	14
3.2.2.2 Assembly Data Types That Come with the System	14
3.2.3 RMA Data Types	14
3.3 Defining the Numbering Pattern for Your Products	15
3.4 Creating Bills of Material (BOMs).....	15
3.4.1 What Is a BOM?	15
3.4.2 Specifying a Component's Assembly Operation.....	15
3.4.3 Specifying a Component's Reference Designator	15
3.4.3.1 What Is a Reference Designator?	15
3.4.3.2 Rules for Specifying Reference Designators	16
3.4.4 Changing BOMs after Release	16
3.4.4.1 System Rules.....	16
3.5 Working with Phantom BOMs	16
3.6 Working with Component Traceability	17
3.6.1 Benefits of Component Traceability	17
3.6.2 What Is the AS-Built History?.....	17
3.6.3 Types of Component Traceability.....	17
3.6.4 How Time-Based Component Traceability Works.....	18
3.6.4.1 Slot Identifiers in Resource Slot Config Setup and Load or Replenish.....	18
3.6.4.2 Using Other Slot Identifiers	19
3.7 Creating PODs for Assemblers	19
3.7.1 Working with PODs for Assemblers.....	19
3.7.2 How Assembly Point Works	19
3.7.3 Component Identifiers in Assembly Point.....	20
3.7.4 Using Other Component Identifiers	20
3.8 Creating PODs for SFC Processing	20
3.9 SFC Processing.....	20
3.9.1 Setting up the POD for Process Lots.....	21
3.9.1.2 What Operators Can Do with Process Lot (PR560) in the POD	22

SAP ME How-To-Guide for Setting up Products

3.9.1.3	What Operators Can Do with Process Lots in the Operation POD	22
3.9.1.4	Creating Process Lots Outside of the Operation POD	22
3.9.2	Setting up the POD for Carrier	22
3.9.2.1	What Is a Carrier?.....	22
3.9.2.2	What Operators Can Do with Carrier Type Maintenance.....	23
3.9.2.3	What Operators Can Do with Carriers in the POD	23
3.9.3	Setting up the POD for Serialization.....	23
3.9.3.1	What Is Serialization?.....	23
3.9.3.2	System Rules That Affect Serialization.....	24
3.9.4	Setting Up the Operation POD for Splitting (SFC Split)	24
3.9.4.1	What Is SFC Split?	24
3.9.4.2	When Would an SFC Have a Quantity Greater Than 1?	25
3.9.4.3	System Rules That Affect SFC Split	25
3.9.4.4	Running SFC Split with Log NC	25
3.9.5	Setting Up the POD for SFC Merge	26
3.9.6	Setting Up the POD for SFC Quantity Adjust	26
3.9.6.1	What Is SFC Quantity Adjust?.....	26
3.9.6.2	Adjusting SFC Quantity Automatically.....	27
3.10	Working with Shop Orders and Demand	27
3.10.1	What Is an SFC?	27
3.10.2	What are Shop Orders?.....	28
3.10.3	Shop Order Types	28
3.10.4	Working with Production and Repetitive Orders	28
3.10.5	Overriding Values	29
3.10.6	Releasing Demand	29
3.10.7	System Rules for Shop Orders and Release.....	29
3.10.8	Statuses for Release.....	30
3.10.9	Changing Shop Orders After Release	31
3.10.9.1	Changing a Shop Order's BOM.....	31
3.10.9.2	Transferring an SFC to Another Shop Order	31
3.10.10	You can use Web Services to automate transfers of SFCs to other shop orders. Using Customer Orders.....	32

SAP ME How-To-Guide for Setting up Products

3.11 Post-Release – Production Activities	32
4.1 ERP Inbound Integration	33
4.2 Outbound ERP Integration	33
5.1 Setting Up Products without Component Traceability	33
5.2 Setting Up Products with Component Traceability	34
5.3 Setting Up Time-Based Component Traceability (TBCT)	35
5.4 Enabling Operators to Create Trackable SFCs.....	35
5.5 Setting Up Component Usage Control.....	36
5.6 Creating and Releasing Shop Orders	36
5.6.1 Production and Repetitive Shop Orders	36
5.6.2 RMA Shop Orders	37

1 Introduction

1.1 Purpose

The SAP ME How-To-Guide for Setting up Products is intended to provide sufficient information to enable products to be easily configured and readily utilized in SAP ME to meet business needs, making use of available best practices.

1.2 Scope

This document covers all aspects of setting up production lines in SAP ME.

1.3 Glossary

Activity	An executable software unit in SAP ME
Activity Hook	See Hook Activity and Hook Point
Assembly	A material that is made up of other materials, which are components and/or other assemblies (subassemblies)
BOM	Bill of Material – The association of components to a parent material
Carrier	A carrier can be a tray that is used to move or transact upon raw materials, semifinished or finished goods (SFCs) on the shop floor.
Component	A material that is in an assembly or sub-assembly (has a parent material)
Hook Activity	An SAP ME activity that can be executed automatically at a hook point
Hook Point	A processing point in SAP ME where the execution of an activity can be configured to occur automatically (e.g. at Pre-Complete for an operation)
Item	Previous terminology for a material
Material	A unique manufactured or purchased part that is processed or consumed on the shop floor
Operation	A procedure performed at a resource; an element of a routing
Parent Material	An assembly or subassembly (i.e. a material that has components)
PCB	Printed Circuit Board
POD	Production Operator Dashboard - configurable SAP ME module designed for use by factory floor operators

Resource	A machine, work station or other piece of equipment used to perform an operation
Resource Type	A category, such as hand tool, lathe, mill, oven or work bench, used to group resources
Routing	A series of operations, or routing steps
SFC	Shop Floor Control unit - a single instance of a material or a batch of material being processed on the shop floor. Also an identifier used to uniquely identify the unit for tracking.
Subassembly	A parent material (assembly) that is also a component of a different parent material (assembly)
TBCT	Time Based Component Traceability
Time-Based Resource	A resource where identification of the assembled components is determined based upon the time at which the parent SFC was processed at the resource
VTR	Visual Test and Repair – a model viewer that interacts with the Nonconformance feature to assist in logging NC Codes
Work Center	A representation of a portion of the shop floor containing one or more resources and/or one or more other work centers (in a hierarchy)

2 Overview of Setting up Products

2.1 Description and Applicability

2.1.1 Why Set Up Products?

Set up products to tell the system the details about what is to be manufactured on the shop floor. This includes the products and components to be manufactured and the purchased components to be utilized. This information is used when releasing demand to the floor.

2.1.2 Decisions to Make

When you set up your products, you must decide:

- Which products that you manufacture, and which components that you manufacture or purchase to build your products, you want to track in the system.
- What information you want to collect about components.
- What numbering patterns you want to use for your products.
- What bills of material (BOMs) you use to manufacture your products.
- Whether you will use component traceability.
- How you want production operators to enter information in the POD as they assemble products.
- How you want production operators to work with SFCs on the line.

- How you want to set up your shop orders.

2.1.3 Setting Up Products and Components

The first step in setting up your products is to create material records that reflect the product you want to build on your shop floor. You create records for both parents and components.

Components are linked to the parent via the Bill of Material (BOM) assigned to the parent.

2.2 Business Purposes / Functions

The following are the functions, for setting up products, which are described in section 3:

- Defining Product and Components
- Collecting Information
- Defining Numbering Patterns
- Creating Bills of Material
- Creating Phantom BOMs
- Working with Component Traceability
- Creating PODs for Assemblers
- Creating PODs for SFC Processing
- Working with Shop Orders and Demand
- Post-Release Production Activities

3 Functions for Setting up Products

3.1 Defining Products and Components

The first step in setting up your products is to create material records that reflect the product you want to build on your shop floor. In Material Maintenance, you create records for both the parent material and components. The components are also created as material records. Components are linked to their parent in BOM Maintenance. Products, components and BOMs can also be created in ERP and passed to SAP ME. See [ERP Inbound Integration](#) for more information.

3.1.1 Working with Materials

In order to understand materials, you must understand parents, components, and assemblies.

3.1.1.1 What Is a Parent?

A parent is a higher-level assembly in a cascading hierarchy of production material. For example, if you manufacture printers, then the printer is the top-level assembly that is made up of components and other assemblies.

You create parent material records in Material Maintenance.

3.1.1.2 What Is a Component?

A component is a material that is the raw stock, part, or subassembly that goes into a higher-level assembly. For example, a resistor that goes onto a printed circuit board (PCB), a PCB that goes into a printer, a seal that goes into a pump or the fuel pump that goes onto an engine. A material can be both a component and a parent material. A subassembly is an example.

You create a record for each component that goes into a higher-level assembly in Material Maintenance.

3.1.1.3 What Is an Alternate Component?

An alternate component is a material that may be substituted for the original component.

Note: Before specifying alternates, you must create a material record for the component in Material Maintenance. You can define alternate components both in Material Maintenance and BOM Maintenance. However when assembling components the system allows to use alternates defined only in one of these activities based on the **Enable BOM Alternate Use** check box setting in BOM Maintenance. See the SAP ME online help for BOM Maintenance - Component Details for more information.

3.1.1.4 What Is an Assembly?

An assembly is a material that is made up of other materials, which are components and/or other assemblies (subassemblies). In other words, it is something that is assembled from its constituent parts. Examples are a pump, an engine, a computer motherboard and a cell phone. A subassembly is an assembly that has a parent material.

3.1.1.5 What Is a Material?

A material is a component or assembly worked on or consumed on your shop floor. Examples of materials that are components are resistors, capacitors, gears, turbine blades and bolts. Examples of materials that are assemblies are printers, motherboards, turbines and pumps. Assemblies such as motherboards and pumps are examples of materials that can be both components and assemblies.

You create a record, in Material Maintenance, for each material you want to track.

3.1.2 Working with Lots and Panels

If you work with lots and panels on your floor, you can indicate this in Material Maintenance.

3.1.2.1 What Is a Lot?

A lot is a batch of like materials. Examples of lots are a reel of identical resistors, a box of identical bolts. In the system, you use the **Lot Size** field to specify the number of pieces in the lot. In SAP ME a lot is commonly referred to as a non-serialized SFC.

Note: If the material has a lot size of one, an operator can use the **Serialize** button in the POD to renumber the SFC. For more information on serialization, see [Setting Up the POD for Serialization](#) in this guide.

The lot size determines how many SFCs are created, and the quantity for each SFC, when an order is released to the shop floor. If the lot size is 5 and an order is released with a build quantity of 8, two SFCs will be created. The first SFC will have a quantity of 5 and the second SFC will have a quantity of 3.

In the SFC Report, the quantity of the SFC is typically the lot size of the corresponding material. However, this can be affected by the build quantity at order release, as indicated above, and by as SFC split.

If you buy or build materials in lots, specify **Any Number** or **Whole Number** in the **Qty Restriction** field on the Main tab of Material Maintenance. If you are building or buying discrete parts in lots, you should only use **Whole Number**. **Any Number** is used for materials where the quantity value could contain a non-zero decimal portion (e.g. 2.3 or 1.5).

3.1.2.2 What Is a Panel?

A panel is a group of material instances (pieces) that are connected together. Typically, they are connected together in a square or rectangular pattern. Examples of panels include:

- A rectangular pattern of connected, stamped, metal parts
- Plastic molded pieces that are connected in a square pattern
- Integrated Circuits on a wafer

When you create panel records in the Material Maintenance activity, the system assigns a location to each piece on the panel. In the POD, operators can nonconform specific locations on a panel. For example, if an integrated circuit at location 3 on a panel fails a test, the operator can nonconform the piece at location 3.

3.1.2.3 Creating Panel Records

When creating panel records, do the following in Material Maintenance:

1. On the Main tab, specify a quantity of greater than 1 in the **Lot Size** field.

Note: The lot size is the number of pieces on the panel.

2. Specify **Whole number** in the **Qty Restriction** field.
3. Select the **Panel** checkbox.
4. Complete the fields on the remaining tabs to define the panel, as needed.
5. Save the panel record.

3.1.3 Creating Trackable SFCs

While you can track all SFCs in the system, a trackable SFC is one that operators can create on-the-fly on the shop floor. A trackable SFC is for components that do not have SFC numbers. These components are typically purchased or manufactured outside the system, for example at another facility or on a shop floor using a legacy system. For more information, see the [Setting Up Products](#) section of this guide.

3.1.4 Assigning Routings to Materials

When you define a manufactured material, you must specify a default routing for the material. The default routing is the initial routing used to manufacture the material, if more than one routing is used. Then, when you create and release a shop order for the material, the SFCs are released to this routing. Operators can override the routing specified in Material Maintenance on release of demand for the material.

Note: To release SFCs to the current version of the routing, leave the **Routing Version** field blank.

3.1.5 Component Usage Control

You can control how many times you allow users to add a specific component, such as PCBOARD with SFC number ABC010, to assemblies in Assembly Point or As-Built Configuration. This prevents users from reusing components that may no longer be in good working condition.

The usage count is the number of times a specific component has been added to any assembly. You can also allow certain users to reset the usage count for a component by giving them permissions to the Component Usage Reset activity. For more information see the [Setting Up Products](#) section of this guide.

3.1.6 Working with Material Groups?

In the system you can create material groups. A material group is a set of materials grouped together for convenience. At other places in the system where you would otherwise need to specify multiple materials, you can instead specify a material group.

You create material groups in Material Group Maintenance. You can associate materials with material groups in either Material Maintenance or in Material Group Maintenance. A material group cannot contain subgroups, but you can assign a material to multiple material groups.

3.1.7 Activity Hooks

There is one hook point, PARSE_COMPONENT, which you can set at the site level for a material. This hook point occurs during the Assembly Point activity. For more information, see the SAP ME How-To-Guide – Setting up Activity Hooks.

3.1.8 Using the Vendor Feature

The Vendor feature allows you to track information about vendors that supply your purchased components. You can also place components on hold at various levels. For more information, see the SAP ME online help for Vendor Maintenance.

3.1.9 Placing Components into Inventory

In Assembly Point and As-Built Configuration, operators can reference components by inventory ID. You can add components to inventory three ways:

- Automatically, for components you manufacture
- Manually, for purchased components
- Through Web services, for purchased components

Use the method you think is most appropriate for your production environment.

3.1.9.1 Adding Manufactured Materials to Inventory Automatically

The system can automatically place the SFCs you manufacture into inventory as they successfully complete production. The SFC number becomes the inventory ID of the component. To add SFCs to inventory when they reach the end of their production routing:

1. Set the *Track Inventory* system rule in the Production Tracking group to **true**.
2. When you define the component in Material Maintenance, select either of the following values in the **Type** field: **Manufactured/Purchased** or **Manufactured**.

3.1.9.2 Adding Purchased Components to Inventory Manually

Operators can use Inventory Receipt to receive purchased components into inventory. For more information, see the SAP ME online help for Inventory Receipt.

3.1.9.3 Adding Purchased Components to Inventory

To add purchased components to inventory, set up Web Services to import inventory records into the system.

3.2 Collecting Information

The Assembly category in Data Field Assignment Maintenance allows you to collect information when operators add and/or remove components from assemblies, or add material(s) to inventory.

3.2.1 What Is a Data Type?

A data type is a set of fields you can display to users to collect information about individual components or higher-level assemblies during a process, such as assembly, disassembly, inventory receipt, nonconformance, packing, or working with RMAs. Data types are created in the Data Field Assignment Maintenance activity (SY130). Data Types are made up of Data Fields. Data Fields can be created in Data Field Definition Maintenance activity (SY160). For more information, see Data Field Definition Maintenance and Data Field Assignment Maintenance in the SAP ME online help.

3.2.2 Assigning Assembly Data Types to Materials

The assembly data types you define in Data Type Maintenance appear:

- In the drop-down list of the **Data to Collect on Assembly**, **Data to Collect on Removal** and **Data to Collect on Inventory Receipt** fields on the Build tab in Material Maintenance.
- When you browse on the **Assembly Data Type** field on the Component Details window – Main tab.

If you specify a value in the **Assembly Data Type** field in BOM Maintenance **and** select a data type from the **Data to Collect on Assembly** field in Material Maintenance for the same component, the data type you selected in BOM Maintenance takes precedence over the data type selected in Material Maintenance. The system displays fields for the data type selected in BOM Maintenance to the operator during the assembly process.

Note: If you do not want to collect data during assembly or removal of components, or during inventory receipt, leave the default value, NONE, in the respective fields.

The NONE data type displays no fields to the operator by default.

During production, the system adds the information it collects from operators to other data recorded in the As-Built History.

3.2.2.1 Identifying Field

When you define the fields in an assembly data type, you must include a data field such as:

- COMPONENT
- INVENTORY_ID
- INVENTORY_ID_SFC
- SFC

These fields identify the component to the system. If you want to use a different identifier, you must create a hookable activity to run at the PARSE_COMPONENT hook point. For more information, see the SAP ME How-To-Guide – Setting up Activity Hooks.

3.2.2.2 Assembly Data Types That Come with the System

The system provides the following assembly data types:

- **EXTERNAL_LOT** - Collects the lot number of the material provided by the vendor or other outside source, and uses the component name as the component identifier.
- **EXTERNAL_SERIAL** - Collects the serial number of the material provided by the vendor or other outside source, and uses the component name as the component identifier.
- **INV** - Collects the inventory ID of a component in inventory, and uses the component's inventory ID as the component identifier. See [Placing Components into Inventory](#) for information on assigning inventory IDs and placing components in inventory.
- **INV_SFC** - Collects the inventory ID or SFC of a component in inventory, and uses the component's inventory ID or the SFC as the component identifier.
- **ITEM_VERIFY** - Collects only the name of the component, and uses the component name as the component identifier.
- **NONE** - Collects no information from the operator, and uses the component name as the component identifier.
- **SFC** - Collects only the name of SFC of the material, and uses it as the component identifier.
- **VENDOR** - Collects the name of the manufacturer of the material, and uses the component name as the component identifier.

Note: You can also create custom fields in Data Field Definition Maintenance to collect data that is not listed above.

Caution: Do not change the INV, ITEM_VERIFY, and NONE assembly data types. If you change the settings, you may see unexpected results when your operators add components defined with those assembly data types.

3.2.3 RMA Data Types

In Data Type Maintenance, you can also define fields for users working with RMA shop orders. For more information about RMA, see the SAP ME online help for Data Type Maintenance and the “Working with Shop Orders and Demand” section of this guide.

3.3 Defining the Numbering Pattern for Your Products

You can create numbering patterns for numbers the system generates on the shop floor, such as SFCs at release, SFCs at serialization, process lots, and so forth. The system comes with a default pattern for each type of number. You can change these patterns as needed for your shop floor. For more information about numbering patterns, see the SAP ME online help for Next Number Maintenance.

3.4 Creating Bills of Material (BOMs)

BOMs can be downloaded from SAP ERP or they can be created in SAP ME. The following assumes that you are creating BOMs in SAP ME. For information regarding downloading BOMs from SAP ERP, see [ERP Inbound Integration](#) in this document.

Now that you have created material records, assembly data types, and next numbering patterns, you must create BOMs for the products you manufacture. In BOM Maintenance, you create records that define:

- The components used to build an assembly.
- The assembly operations where your operators or machines add the component to the assembly.
- Alternates for the component.

3.4.1 What Is a BOM?

A BOM is a list of all the components of a parent material (assembly). This can include subassemblies, discrete materials and raw stock. The BOM also specifies the quantity required of each component.

3.4.2 Specifying a Component's Assembly Operation

The **Assembly Operation** field is optional when you add a component to a BOM.

If you want to use component traceability, you must specify the component's assembly operation in the **Assembly Operation** column for the component in BOM Maintenance. For more information about component traceability, see [Working with Component Traceability](#).

If you use As-Built Configuration to collect assembly data about a component, you do not need to specify the component's assembly operation in BOM Maintenance.

3.4.3 Specifying a Component's Reference Designator

If you specify a reference designator in BOM Maintenance, the system displays a **Ref Des** field when POD operators click the **Assembly** button.

3.4.3.1 What Is a Reference Designator?

A reference designator is the physical location of a component on a printed circuit board or in some other type of assembly.

Reference designators specify where operators or machines must load components onto assemblies. For example, reference designators can tell an operator that you want the same component, such as a specific resistor model, loaded in four different places on a specific board.

Reference designators can also be used to distinguish between multiple instances of the same component in an assembly. For example, if two identical instances of a material (say a gear) are used in the same subassembly, each instance of the material in the BOM could be assigned a different reference designator.

Additionally, reference designators are used as the unique identifier of model elements in Visual Test and Repair (VTR) in SAP ME. For more information on VTR, see the SAP ME How-To-Guide – Visual Test and Repair (VTR).

Reference designators are usually short combinations of letters and numbers, such as P2, VR1, D4, V1, and C5. In the case of a circuit board, these designators sometimes are printed directly on the circuit board.

3.4.3.2 Rules for Specifying Reference Designators

The *Ref Des must be unique* system rule controls whether you can specify the same reference designator more than once in the same BOM. You must enter more than one reference designator for a component with a quantity greater than one in BOM Maintenance.

The *Ref Des is required* system rule controls whether it is required to enter reference designator to a BOM component. The ref des quantity must be equal to the assembly quantity.

The *Specific BOM Component Version Required* system rule controls whether it is required to enter a version value for each BOM component in BOM Maintenance.

3.4.4 Changing BOMs after Release

Because a BOM can be shared by many shop orders, the system does not allow you to add and remove components from a BOM after you release demand for an assembly defined to use the BOM. However, operators can change BOM components for specific shop orders and SFCs in WIP BOM Reconfiguration. When operators use WIP BOM Reconfiguration, the system creates a copy of the BOM for either a single SFC or a shop order. For more information, see the SAP ME online help for WIP BOM Reconfiguration.

If your manufacturing environment uses BTO/CTO, to improve performance, you can set the *Create Shop Order BOM on Release* system rule to **true** to automatically create a copy of the BOM for the shop order when it is released.

3.4.4.1 System Rules

System rules that control how BOMs work on your shop floor are included in the Component Traceability, Order, and Non Conformance groups in System Rule Maintenance. For more information, see the SAP ME online help for System Rule Maintenance.

3.5 Working with Phantom BOMs

Phantom BOMs (or Phantom Component Assemblies) have replaced the previous Kit functionality. For more information, see Phantom Component Assemblies in SAP ME online help.

3.6 Working with Component Traceability

Component traceability allows you to configure, validate, and trace data for components worked by assembly machines or operators on the shop floor.

3.6.1 Benefits of Component Traceability

With component traceability, you can:

- Collect the data you need about components added at assembly operations.
- Run configuration checks to verify all required components have been added to an assembly.
- Determine the number of affected SFC numbers.
- Identify the components used in a given SFC number.
- Identify parent assemblies containing failed components.
- Identify the parent assemblies built using components in a particular vendor lot.
- Determine supplier information for failed components.
- View and print reports about this information.

3.6.2 What Is the AS-Built History?

As-Built History is a behind-the-scenes record of the components added to and removed from a parent SFC. The As-Built History is internal to the system.

As-Built History includes basic information about the component, including the name of the component, whether the component was added or removed, when it was added or removed, and the name of the assembly. It can also include additional data collected from operators.

The system records As-Built History when operators use the Assembly Point or As-Built Configuration activities to add or remove components. The system can also generate As-Built History from records kept at the resource level.

3.6.3 Types of Component Traceability

The system supports two types of component traceability:

- Manual/discrete
- Time-based

3.6.3.1 What Is Manual/Discrete Component Traceability?

Manual/discrete component traceability allows you to trace data for components worked by operators on the shop floor. The system associates component assembly data that the operator enters with the SFCs the operator works, so that you can view the data in SFC and Genealogy Reports.

The system stores this information in individual records, one for each component on each SFC. This method can generate a large volume of records, but allows you to see As-Built History data quickly.

To use manual/discrete component traceability, you set up the Assembly Point activity in the POD. For more information, see [Creating PODs for Assemblers](#) in this guide.

3.6.3.2 What Is Time-Based Component Traceability?

Time-based component traceability (TBCT) allows you to automatically trace data for components worked by assembly machines on the shop floor. Shop floor personnel may enter

component assembly data at resources for each reel loaded at a pick and place machine, or a lot of component parts at a robotic assembly station; but they are not required to collect data for each SFC worked. The system associates component assembly data that the operator enters with the SFCs the resource works, so that you can view the data in SFC and Genealogy Reports.

3.6.4 How Time-Based Component Traceability Works

In time-based data collections, the system uses log files to record the information required to track components. This method minimizes the volume of records.

When you need to see assembly details about a component tracked through time-based component traceability, the system extracts the required information from the log files and creates As-Built History records.

The system generates the As-Built History for components tracked by time-based component traceability in situations like these:

- You run an As-Built Summary report on the assembly or a Component Usage report on the component.
- You run the As-Built Configuration activity to remove the component, as for example at a rework operation.

3.6.4.1 Slot Identifiers in Resource Slot Config Setup and Load or Replenish

Resource Slot Config Setup (EN530) and Load or Replenish (EN531) are part of TBCT. The system allows operators to record which components they load or replenish onto resources. Operators record their actions by clicking the **Load or Replenish** button in either Resource Slot Config Setup (EN530) or Load or Replenish (EN531). If you set up TBCT to collect additional data, when an operator clicks the **Load or Replenish** button, and Resource Slot Config Setup (EN530) or Load or Replenish (EN531) is in CHOOSE mode, the system displays a **Choose** field.

Operators must enter or scan one of the following values in the **Choose** field for each component they are loading or replenishing on the resource:

- The slot name, as defined in Slot Configuration Maintenance.
- The component associated with the slot, as defined in Slot Configuration Maintenance.
- The alternate component name specified in Material Maintenance.
- The component's inventory ID.

Note: CHOOSE mode in Resource Slot Config Setup (EN530) and Load or Replenish (EN531) is determined by one of its activity rules. For more information about activity rules for Resource Slot Config Setup (EN530) and Load or Replenish (EN531), see the SAP ME How-To-Guide – Setting up Activity Rules.

3.6.4.2 Using Other Slot Identifiers

If your operators need to enter another type of value to identify slots when using Resource Slot Config Setup (EN530) or Load or Replenish (EN531), you must write a custom POD plug-in activity that looks up that value, and associates it with the PARSE_SLOT_COMPONENT hook point. For more information, “The PARSE_SLOT_COMPONENT Activity Hook” section in the SAP ME How-To-Guide – Setting up Activity Hooks.

Note: The PARSE_SLOT_COMPONENT hook point is available only when Resource Slot Config Setup (EN530) or Load or Replenish (EN531) is in CHOOSE mode.

3.7 Creating PODs for Assemblers

POD plug-ins enable you to set up the POD for recording specific types of work production operators perform on products. This section covers information about setting up various POD button activities. For more information about the POD, see the SAP ME How-To-Guide - POD.

3.7.1 Working with PODs for Assemblers

When you use manual/discrete component traceability, you can track information about the components operators assemble onto parent SFCs. Operators can record assembly work in both Operation and Work Center PODs using the Assembly Point activity.

In the Operation POD, the Assembly Point (CT500) plug-in is triggered when the operator selects the Assemble button or the Assemble activity from the list of Activities displayed by the Activities button.

In the Work Center POD, the Assembly Point (CT500) plug-in is triggered when the operator clicks the Assemble button in the Component list.

Note: Assembly Point allows operators to enter only components defined in the assembly’s BOM. Operators can work with one more parent SFCs at a time. Operators cannot record the removal of components. If some of your operators need to record removal of components or the addition of non-BOM components, instruct them to use As-Built Configuration to record this type of work. Be sure to give them permission for this activity in User Group Maintenance.

3.7.2 How Assembly Point Works

For each component in the BOM of the assembly:

- If no components in the BOM have additional data to collect, the POD displays the **All components have been assembled successfully** message, and Assembly Point writes this information to the As-Built History. The operator can then complete the SFC in the POD.
- If there is additional data to collect, Assembly Point lists BOM components in a table and displays fields in the lower half of the window for the operator to fill in.
- When the operator adds the last component in the BOM, Assembly Point closes and returns to the previous screen, usually the Active Work list, and the POD displays the **All components have been assembled successfully** message.

3.7.3 Component Identifiers in Assembly Point

Assembly Point (CT500) has two modes, CHOOSE and SEQUENCE, determined by the activity's rule setting. In CHOOSE mode, the system displays the **Choose** field as the component identifier field. In SEQUENCE mode, the system displays the **Component** field.

The operator can enter any of the following values in these fields:

- The component name, from the **Material** field value in Material Maintenance.
- The component's SFC number.
- The alternate component name specified on the Alternates tab in BOM Maintenance. See BOM Maintenance online help for more information.
- The component's inventory ID, in the system inventory.

Note: For more information about rules for Assembly Point (CT500), see the SAP ME How-ToGuide – Setting up Activity Rules.

3.7.4 Using Other Component Identifiers

Before displaying additional data fields, the system matches the value the operator entered in the **Choose** or **Component** field with the As-Built History. If you want operators to enter another identifier, you must write a custom POD plug-in activity that looks up that value, and associates it with the PARSE_COMPONENT hook point. For more information, see the SAP ME How-ToGuide – Setting up Activity Hooks.

3.8 Creating PODs for SFC Processing

POD plug-ins enable you to set up the POD for recording specific types of work production operators perform on products. This section covers information about setting up various POD button activities. For more information about the POD, see the SAP ME How-To-Guide - POD.

3.9 SFC Processing

On your shop floor, product and components do not remain in a static state as they move down the assembly line. Instead, operators group components together and take them apart as they use them for assembly. They may also take assemblies apart. In addition, you may purchase or build some components in lots, or build other components on panels.

The system allows you the flexibility to reflect how you work with product and components on your floor by allowing you to assign SFC numbers both individually and in groups, as follows.

- Individual SFC: one to one
- Groups of SFCs: process lot
- SFCs with a quantity greater than one (non-serialized): components purchased or built in lots; components built on panels.
- Shop orders: one or more SFCs.

Generally, operators can work all SFCs in a shop order by entering the shop order number in the POD. However, once an SFC in the shop order is nonconformed and taken out of the shop order, operators can no longer reference the shop order. At this point, instead of using the shop order

number, operators can put the remaining SFCs in a process lot and refer to the group by process lot number. Operators can add and remove SFCs at the same operation and resource to a process lot. In addition, operators that release demand to the floor can create process lots at release time.

You control how operators on the floor can group and ungroup SFCs by giving them access to the POD plug-ins described below.

The system generates SFCs when users:

- Release a shop order.
- Serialize a parent SFC.
- Run the Create SFCs hookable activity. □ Run RMA SFC Receipt.

The number of SFCs the system releases for shop orders and the quantity of each SFC depends on the values you entered for the material record in the **Lot Size**, **Quantity Restriction**, and **Qty Multiplication** fields in Material Maintenance.

The following table illustrates this:

Material	Lot Size	Qty Restr.	Qty Mult.	System generates	Example
Final Assembly or End product	1	Only 1	N/A	1 SFC for each unit in Qty to Release If Qty=10, you get 10 SFCs	Pump
Panel of 6	6	Any/Whole	N/A	1 SFC for each multiple of 6 in Qty to Release. Rounds up. If Qty is less than or equal to 6, you get 1 SFC.	6 pieces on a panel to be serialized into 6 SFCs on a later routing-step
Purchased product bought in bulk	40	Any	N/A	No SFCs. Instead, track with an Inventory ID in Inventory Receipt Qty is less than or equal to 40, you get 1 Inventory ID number	Resistors bought in lots of 40.
Material	Lot Size	Qty Restr.	Qty Mult.	System generates	Example
Product manufactured in bulk	10	Any	N/A	1 SFC for each multiple of 10 in Qty to Release. Rounds up. If Qty is less than or equal to 10, you get 1 SFC.	10 gears built in a lot.
Wafer of 9	1	Any	9	1 SFC for each unit in Qty to Release If Qty=10, you get 10 SFCs	The wafer is cut into 9 pieces at a later routing-step where the SFC Quantity Multiplication (PR597) activity is hooked.

3.9.1 Setting up the POD for Process Lots

3.9.1.1 What Is a Process Lot?

A process lot is a group of SFCs, which production operators can work on at the same time. A process lot number represents one or more SFCs.

As you know, to create and release work demand, the system releases individual SFCs for components or parts to the shop floor. At some operation, it may be more efficient for an operator to work a set of SFCs as a group. Such a group is called a process lot. Processing product in process lots allows an operator to enter a process lot ID that identifies a set of SFC numbers, rather than entering SFC numbers one at a time. Operators may keep the group of SFCs together as it travels down the routing and remove SFCs from the group later.

3.9.1.2 What Operators Can Do with Process Lot (PR560) in the POD

When you associate a button on a POD with Process Lot (PR560), an operator using that POD can:

- Group SFCs into a new process lot.
- Add SFCs to an existing process lot.
- Remove SFCs from an existing process lot.

However, all SFCs must be in queue or in work at the same operation. Operators cannot add SFCs that are completed or on hold to a process lot.

When creating a new process lot, operators can enter a process lot number or allow the system to create the new number by clicking **New Process Lot**. The system creates the new process lot number based on the numbering scheme defined for the number type Process Lot in Next Number Maintenance.

3.9.1.3 What Operators Can Do with Process Lots in the Operation POD

Once a set of SFCs is added to a process lot, operators can start, complete, and signoff the entire process lot by entering the process lot number in the main input field. If an operator completes an individual SFC that belongs to the process lot, the system gives the operator the option of removing the SFC from the process lot or canceling the complete.

Note: The main input field is the **SFC** field in the operation PODs.

3.9.1.4 Creating Process Lots Outside of the Operation POD

Operators can group all SFCs in a shop order together in a process lot when creating demand by selecting the **Add to New Process Lot** check box in either Shop Order Release or Create and Release Demand.

3.9.2 Setting up the POD for Carrier

3.9.2.1 What Is a Carrier?

A Carrier is a mean of transportation that is used to move raw materials, semifinished or finished goods (SFCs) from one location to another. Examples of carriers are trays and cassettes.

Carriers are used in Shop-floor to group the individual SFCs. The transactions are performed based on the carrier, rather than each SFC.

3.9.2.2 What Operators Can Do with Carrier Type Maintenance

Carrier Type maintenance enable users to create/edit carrier type. You can use the CREATE_TYPE_MAINT activity to define the layout of the carrier and validation points.

- In the Main tab, you can defined the layout out and capacity of the carrier. You can maintain the number of rows and columns of a carrier, and define its' maximum quantity.
- In the Validation tab you may choose the material or material group that can be exclusively added to the carrier.

3.9.2.3 What Operators Can Do with Carriers in the POD

When you associate a button on a POD with “CREATE_CARRIER”, operators can choose Create Carrier to open the Create Carrier POD plug-in.

- Enter a carrier name in the Carrier ID field
- Enter a carrier type that operators want to assign to the carrier
- Enter an SFC number that operator want to add to the carrier
- Selected a position for the SFC number and choose add
- To move to a position of the carrier, choose More>Go To.
- To view detailed information about the SFC numbers that the operators have added, choose More>Details
- Operators can remove all or only selected SFC numbers from the carrier

Note:

- You can create a new carrier if the ALLOW_CREATE_CARRIER rule for the CREATE_CARRIER activity is set to YES in Activity Maintenance
 - You can delete the carrier ID if the ALLOW_DELETE_CARRIER rule for the CREATE_CARRIER activity is set to YES in Activity Maintenance
-

After saving the entries, the operators can start the SFCs within the carrier in the POD by entering the Carrier ID into the main input field of the POD Selection and clicking the Start button. Once all of the work is complete, the operator can then complete the SFCs within carrier ID by entering the Carrier ID in the main input field of the POD Selection and clicking the Complete button.

3.9.3 Setting up the POD for Serialization

3.9.3.1 What Is Serialization?

For efficiency, your production operators may keep some components together in a lot as they move down a routing. In addition, your plant may build PCA boards or other components on a panel that hold multiple pieces together. When you define a material in Material

Maintenance with a lot size greater than one, or as a panel, the system generates only one SFC on release to represent the entire lot or panel. Before serialization (splitting) of a panel, each piece on the panel is identified by its location on the panel.

At some operation on your production line, operators may separate one or more individual pieces from the lot or panel. At these operations, operators need a button to run Serialize (PR550), which creates new SFC numbers for each piece in the lot or panel.

With Serialize (PR550), operators can record that they have separated one, several, or all pieces from a lot or panel. Serialize (PR550) identifies panel pieces by location.

Operators can also run Serialize (PR550) against a single unit SFC to assign it a new SFC number. In this scenario, the old SFC number's quantity becomes 0 (zero), and the system removes it from production by giving it an Invalid status.

With the rules for Serialize (PR550), you can control whether operators enter new SFC numbers or the system generates the number automatically. See the SAP ME How-To-Guide – Setting up Activity Rules.

Note: Before serialization, the original SFC is sometimes called a non-serialized SFC.

3.9.3.2 System Rules That Affect Serialization

The following system rules affect serialization and are included in the Serialization group in System Rule Maintenance. For more information, see the SAP ME online help for System Rule Maintenance.

- Copy NC Data
- Copy Activity Log
- Status of an Empty Lot SFC
- Copy DC Data
- Copy Tooling Data
- Copy Work Instruction (WI) Viewing Data

3.9.4 Setting Up the Operation POD for Splitting (SFC Split)

3.9.4.1 What Is SFC Split?

SFC Split allows operators to move some or all of an SFC's quantity into one or more new SFCs. The operator creates the new SFCs during the split process. SFC Split does not change the total quantity the system is tracking in a shop order, but rearranges the quantity, shifting some or all of it from the original SFC's quantity into new SFC(s). The quantity remains in the same shop order.

SFC Split allows operators to split the existing SFC into smaller lots or to create serialized, single-unit SFCs. It also allows the operator to move the entire quantity of the original SFC into one or more new SFCs, making the original SFC's quantity 0 (zero). If the operator splits off the entire quantity of the original SFC, the original SFC number remains in the database, but because it contains no quantity, it is marked as Invalid.

With an activity rule for SFC Split (PR571), you can control whether the operator must enter SFC numbers for the SFCs created in SFC Split, or the system creates the SFC numbers automatically. See the SAP ME How-To-Guide – Setting up Activity Rules.

SFC Split cannot split SFCs for materials defined as panels. On a panelized material, operators must use Serialize.

Note: SFC split can be run as a POD activity (PR571), or outside the POD as a standalone activity (PR570). The standalone activity calls the POD plug-in activity. See the SAP ME How-To-Guide – Setting up Activity Rules.

3.9.4.2 When Would an SFC Have a Quantity Greater Than 1?

An SFC has a quantity greater than 1 when you release demand for a quantity greater than 1 for a material defined as a panel or other material with a lot size greater than 1.0. For more information on panels and lots, see the [Working with Lots and Panels](#) section of this guide.

3.9.4.3 System Rules That Affect SFC Split

The rules that affect Serialize also control SFC Split. See [Setting Up the POD for Serialization](#) in this guide.

3.9.4.4 Running SFC Split with Log NC

The POD includes two buttons that directly or indirectly run SFC Split (PR571):

- The **Split** button is configured to run SFC Split (PR571).
- The **Log NC** button is configured to first run SFC Split and then run Log NC.

If you configure a **Log NC** button in the Operation POD to run SFC Split immediately before Log NC, clicking the button starts SFC Split and passes the quantity specified in the Operation POD's **Quantity** field into SFC Split. If the operator leaves the **Quantity** field blank, the Operation POD passes in the full quantity of the SFC to SFC Split.

If the quantity is the full quantity (3 of 3, for example), SFC Split closes without performing a split and Log NC runs on the SFC specified in the operation POD. The operator then logs a nonconformance against the entire quantity of the SFC.

If the quantity passed into SFC Split is less than the full quantity (2 of 3, for example), SFC Split splits the partial quantity off the original SFC into a new SFC, and may or may not display the SFC Split screen:

- The SFC Split screen appears if the AUTOMATIC_ID_GENERATION activity option of SFC Split is set to **FALSE** (the default). The operator must manually enter the new SFC number before clicking **Split**.
- The SFC Split screen does not appear if the AUTOMATIC_ID_GENERATION activity option of SFC Split is set to **true**. The system automatically generates the new SFC number based on the pattern in Next Number Maintenance.

In either of the partial quantity cases, Log NC runs after SFC Split so the operator can nonconform the new SFC. The new SFC contains what originally was a partial quantity, but is now the full quantity of the new SFC.

3.9.5 Setting Up the POD for SFC Merge

3.9.5.1 What Is SFC Merge?

SFC Merge allows operators to combine SFCs. The SFCs you merge must have one of the following statuses: New or In Queue. The operator chooses an SFC to be the parent SFC, and SFC Merge moves the entire quantity from the other SFCs into the parent SFC. At the end of the process, the total quantity is in the parent SFC, and the child SFCs have a quantity of zero (0). The system marks the empty SFCs as Invalid to remove them from production. The parent SFC's total quantity after the merge can be larger than the lot size defined for the material.

Note: Merged SFCs must have the same material and material version. Also, the entry in the **Qty Restriction** field in Material Maintenance may limit how operators can adjust quantity of merged SFCs. For example, if the field is set to **Only 1.0**, the operator cannot adjust quantity.

With the activity rules for SFC Merge (PR581), you control the criteria for merging SFCs into a parent SFC. See the SAP ME How-To-Guide – Setting up Activity Rules. SFC Merge cannot merge SFCs for materials defined as panels.

Note: SFC Merge can be run as a POD activity (PR581), or outside the POD as a standalone activity (PR580). The standalone activity calls the POD plug-in activity. See the SAP ME How-To-Guide – Setting up Activity Rules.

3.9.5.2 System Rules That Affect SFC Merge

No system rules specifically affect SFC Merge.

3.9.6 Setting Up the POD for SFC Quantity Adjust

3.9.6.1 What Is SFC Quantity Adjust?

SFC Quantity Adjust allows operators to increase or decrease an SFC's quantity. The SFC whose quantity you adjust must have one of the following statuses: New or In Queue.

If you increase an SFC's quantity using SFC Quantity Adjust to exceed the build quantity defined in the SFC's shop order, the system increases the build quantity in the shop order to equal the actual quantity.

The SFC's quantity after the quantity adjustment can be larger than the lot size defined for the material.

With the activity rule for SFC Quantity Adjustment (PR591), you can control whether operators can run SFC Quantity Adjustment. See the SAP ME How-To-Guide – Setting up Activity Rules.

Note: SFC Quantity Adjustment can be run as a POD activity (PR591), or outside the POD as a standalone activity (PR590). The standalone activity calls the POD plug-in activity.

Note: Operators cannot adjust an SFC's quantity to zero. Also, the entry in the **Qty Restriction** field in Material Maintenance may limit how operators can adjust quantity of merged SFCs. For example, if the **Qty Restriction** field is set to **Only 1.0**, the operator cannot adjust quantity.

3.9.6.2 Adjusting SFC Quantity Automatically

The system can adjust quantity automatically with the hookable activity SFC Quantity Multiplication (PR597). When you use SFC Quantity Multiplication (PR597), the system automatically increases the SFC's quantity by a factor you enter in Material Maintenance. You enter this factor in the material record for the SFC.

When you configure SFC Quantity Multiplication at a Start or Complete hook point of an operation, the activity automatically multiplies the SFC's quantity by the quantity multiplier defined in the SFC's material definition. The operator does nothing to trigger the multiplication other than start or complete the SFC at the operation.

Note: At an operation where the product is always changed to a predefined number, use SFC Quantity Multiplication instead of SFC Quantity Adjustment.

3.9.6.3 System Rules for SFC Quantity Adjustment

No system rules specifically affect SFC Quantity Adjustment.

3.10 Working with Shop Orders and Demand

Shop orders can be created in SAP ME or they can be downloaded from SAP ERP. For information regarding downloading shop orders from SAP ERP, see [ERP Inbound Integration](#) in this document. Once you've set up your production lines and your products, you can release demand for the product to the shop floor. Users on the shop floor can create and release shop orders for product, and can also release demand for product on-the-fly. You can also automate this process.

For more information, see [Creating and Releasing Shop Orders](#) in the "Setting Up Products" section of this guide.

3.10.1 What Is an SFC?

An SFC is a number that uniquely identifies the component or higher-level assembly you are working on to the system. Your shop floor may use SFC numbers as serial numbers/lot numbers or have you scan in bar-coded serial/lot numbers as SFC numbers.

Additionally, an SFC is a unique number representing a specific instance of a particular material defined in Material Maintenance. The SFC number uniquely identifies the specific instance during the manufacturing process.

For example, PRINT900 is a material produced by the ABC plant. However, the SFC number ABC5238 represents the specific instance of PRINT900 that a specific operator is currently building.

3.10.2 What are Shop Orders?

Shop order is an authorization detailing specific work that is to be done on the shop floor. Each shop order is identified by a unique shop order number. Shop Orders can be created in SAP ME or they can be downloaded from SAP ERP. For information on downloading shop orders from SAP ERP, see [ERP Inbound Integration](#) in this document.

When shop orders are released to the shop floor, the system assigns a unique SFC to each material piece or lot in the shop order. To decrease the need for data input by operators, the process of creating shop orders and releasing demand can be automated through the use of Web Services.

3.10.3 Shop Order Types

The system allows you to create several types of shop orders:

- **Production** (Normal). An order authorizing the production of a specified material in specified quantities. For example, an order authorizing the production of 200 printers. The shop order is done when the build quantity is reached.
- **Repetitive**. Same as Production, except the shop order is Done when the planned end date is reached.
- **RMA**. An order authorizing the return of product to the shop floor for corrective action. SFC releases for RMA shop orders work differently than for Production and Repetitive shop orders. For RMA, users can create RMA shop orders in Shop Order Maintenance, and other users can associate an RMA number with the shop order and enter data about the RMA in RMA Shop Order Receipt. For more information about RMA shop orders, see the SAP ME online help for Shop Order Maintenance and [Creating and Releasing Shop Orders](#) in the “Setting Up Products” section of this guide.
- **Engineering**. An order authorizing the build of x (number) of prototypes for the material.
- **Inspection**. An order authorizing the inspection of incoming purchased materials.
- **Rework**. An order authorizing the rework of materials after a first-time build.
- **Tooling**. An order authorizing the build of tools used for manufacturing.
- **Spare**. An order authorizing the production of spare materials.
- **Installation**. An order used to build an end material.

3.10.4 Working with Production and Repetitive Orders

The system allows users to release product demand to the floor with or without shop orders. If you use shop orders on your floor, through user groups and permissions, you can have some personnel, such as office workers, create and modify shop orders, while other personnel on the shop floor release demand for these shop orders.

Users can:

- Create and modify shop orders for product in Shop Order Maintenance.
- Release demand for existing shop orders in Shop Order Release.

- Release demand for product with or without a shop order on-the-fly in Create and Release Demand.

Note: Users cannot release demand for a product in Shop Order Maintenance.

3.10.5 Overriding Values

If desired, you can allow users to override the **BOM**, **Routing**, and **Work Center** fields specified for the product in Material Maintenance in both Shop Order Maintenance and Shop Order Release. Users can override work center values in Create and Release SFC. This allows users to adjust these values to current conditions on the shop floor, such as releasing demand to a routing that is not currently busy.

In Shop Order Maintenance users enter the build quantity for the product (if the shop order did not come from ERP) and the planned start date and planned end date. In Shop Order Release, users can override the planned dates and can release a partial quantity, as needed. In both Shop Order Maintenance and Shop Order Release, users can adjust the priority of the product demand. The capability to override values in Shop Order Release (DM510) is controlled by activity rules.

3.10.6 Releasing Demand

When users release demand for a product, the system creates SFCs for the product according to the way you set up the system (see the [System Rules for Shop Orders and Release](#) topic in this section). After release, operators on the floor can begin working the product and recording the work they do in the POD. Managers can access what operators record in various reports provided in the system.

Note: When users release a shop order with an order type of RMA, the system does not generate SFCs. The users must use the RMA SFC Receipt activity to generate SFCs for an RMA shop order.

3.10.7 System Rules for Shop Orders and Release

System Rule	Description
Allow Re-Use of SFC Numbers on Import	If set to True , the system allows the reuse of an SFC number received with an imported shop order if this SFC number has no activity log records. Can override at: site, material
Create Shop Order BOM on Release	True: Automatically creates a shop order BOM for a specific shop order when the system releases it. The shop order BOM is a copy of the master BOM specified in the BOM field in Material Maintenance for the material record. False (default): Does not create shop order BOMs when the system releases shop orders. The master BOM specified in Material Maintenance is used for the shop order. Can override at: site, material

Create Subassy's on Shop Order Release	<p>True (default): Creates and releases subassembly shop orders when the parent shop order is released. The system determines the subassemblies to be created based on the shop order BOM. Ignores phantom components on release.</p> <p>False: Does not create any subassembly orders when the parent shop order is released.</p> <p>Can override at: site, material</p>
Default Shop Order for Trackable SFCs	<p>Specifies the shop order with which the system associates trackable SFCs</p> <p>Can override at: site</p>
Default Work Center for Release	<p>The name of the default work center</p> <p>Recommendation: Create work centers in Work Center Maintenance. You must also select the <i>SFC Number Can Be Released to This Work Center</i> checkbox in the default work center record in Work Center Maintenance and set the <i>Force Release to Work Center</i> rule to True.</p> <p>Default: blank; this value is required only when you set the <i>Force Release to Work Center</i> rule to True. Can override at: site, material</p>
Enable Order Type Check	<p>True: Performs a validation for the routing against the material and shop order type as defined in Material Maintenance when a shop order is created</p> <p>False (default): Does not perform the validation</p>
Force Release to Work Center	<p>True: Releases the shop order and SFC numbers to the work center specified in the <i>Default Work Center for Release</i> rule</p> <p>False (default): Releases the shop order demand to the routing specified either in Material Maintenance, Shop Order Maintenance, or Shop Order Release</p> <p>Can override at: site, user</p>
Shop Order requires Customer Order	<p>Controls whether the <i>Customer Order</i> field is a required field when creating new shop orders</p> <p>True: Requires users to enter an existing customer and customer order in Shop Order Maintenance before releasing an SFC number for the shop order to the floor</p> <p>False (default): Allows users to release an SFC number for a shop order to the floor without entering an existing customer and customer order in Shop Order Maintenance</p> <p>Can override at: site, material</p>

For more information about other shop order system rules, see the “Order Rules” topic in the SAP ME online help for System Rule Maintenance.

3.10.8 Statuses for Release

Before releasing a shop order to the shop floor, it's a good idea to make sure the following status conditions are met:

The status of the...	Is...
Shop order	Releasable
Material	Releasable or Frozen

Routing	Releasable or Frozen
Operations on the routing	Releasable or Frozen
Work instruction attached to the material, operation, routing, or resource	Releasable
Data collection attached to the material, operation, routing, or resource	Releasable

Note: When automating shop orders and release, additional rules imposed by your MRP/ERP application may also apply.

3.10.9 Changing Shop Orders After Release

Once shop orders are released, you can allow lead operators or other shop floor personnel to make changes to them by giving them permission to the following activities:

- SFC Reassignment
- Change Production

The SFC Reassignment activity (SU560) is used to do the following:

- Move components from a source SFC in one shop order to a target SFC in another shop order
- Swap SFCs (source and target SFCs) between two shop orders, and move components from the source SFC to the target SFC
- Move components from a source SFC in one shop order to a target SFC in another shop order, deleting the source SFC
- Move the source SFC and its components to the target shop order, deleting the target SFC

When you move or swap components, the system adjusts the build history.

The Change Production activity (SU540) is used to change the material, routing, bill of material (BOM), and/or shop order for one or more SFC numbers. It is typically used to fix problems on the shop floor, or to reconfigure assemblies to meet new requirements such as a BOM or routing change.

3.10.9.1 Changing a Shop Order's BOM

To change a shop order's BOM after the shop order has been released to the shop floor, use BOM Maintenance or Change Production.

3.10.9.2 Transferring an SFC to Another Shop Order

To transfer SFCs among shop orders, use SFC Reassignment.

SFC Reassignment allows operators to adjust the As-Built History when they swap two SFCs between two shop orders, or transfer the components in an SFC in one shop order to an SFC in another shop order. In SFC Reassignment, the operator specifies a source SFC and a target SFC, and then can exchange components, shop orders, and even SFC numbers between the two SFCs.

3.10.9.2.1 System Rules for SFC Reassignment

The following system rules in the Production Operations group affect SFC Reassignment:

System Rule	Description
Cancel SFC on Reconfiguration	True (default): Initially selects the <i>Delete SFC</i> checkbox in <i>SFC Reassignment</i> , which deletes the source SFC after the system completes the transfer False : Initially deselects the <i>Delete SFC</i> checkbox in <i>SFC Reassignment</i> , which deletes the target SFC after the system completes the transfer Can override at: site
Transfer SFC on Reconfiguration	True (default): Initially selects the <i>Transfer Source SFC</i> checkbox in <i>SFC Reassignment</i> , which transfers the source SFC to the target SFC False : Initially deselects the <i>Transfer Source SFC</i> checkbox in <i>SFC Reassignment</i> . The target SFC retains its original SFC number. Can override at: site

3.10.9.2.2 Automating SFC Transfers

3.10.10 You can use Web Services to automate transfers of SFCs to other shop orders. Using Customer Orders

The Customer Order Maintenance activity (DM610) enables you to create customer orders in the system and release demand for these orders when you release shop orders. This enables you to associate SFCs and shop orders with specific customers as well as track customer information in the system.

For more information, see the SAP ME online help for Customer Maintenance and Customer Order Maintenance.

3.11 Post-Release – Production Activities

Once you release SFCs to the shop floor, operators can begin recording their work in the POD. They can indicate that they have started an SFC, assembled parts onto an SFC, completed an SFC, and much more.

However, there are times when something other than normal processing occurs with an SFC. For example, an operator may click the **Complete** button before actually finishing an SFC, or you may want to hold a lot that has too many nonconformed parts. For handling these special cases, the system provides a set of production activities in addition to the POD.

You may want to give certain operators, such as lead operators and supervisors, permissions to specific production activities according to their duties.

You can control how some production activities behave with activity rules. For more information about production activities with activity rules, see the “Other Activities with Rules” section in the SAP ME How-To-Guide – Setting up Activity Rules.

4.1 ERP Inbound Integration

SAPMEINT provides the capability to download data from the SAP ERP system to SAP ME. This includes the following master data:

- Material
- Material classification
- BOM
- Routing (standard routing and rate routing)
- Personnel (HR) data with qualification to user with certification
- Work center to resource / work center

It also includes the following order and resource data:

- Production order
- Planned order
- Service (RMA) order
- Equipment scheduled downtime

For more information, see SAP ME ERP Integration in the SAP ME online help.

4.2 Outbound ERP Integration

SAPMEINT provides the capability to download data from SAP ME to the SAP ERP system. This includes the following transaction data:

- Production order yield confirmation
- Component scrap confirmation for production order
- Planned order confirmation
- Component scrap confirmation for planned order
- Service (RMA) order technical completion confirmation
- Equipment usage
- Equipment scheduled downtime
- Equipment unscheduled downtime
- Floor stock receipt
- Floor stock return
- Floor stock scrap
- Floor stock storage location movements
- Data collection for batch and batch characteristics

For more information, see SAP ME ERP Integration in the SAP ME online help.

5 Setting up Products

Prerequisites: Make sure the Implementation Team has set up resources, resource types, operations, and routings, and made decisions about what PODs to create. For more information, see the SAP ME HowTo-Guide – Setting up Production Lines.

5.1 Setting Up Products without Component Traceability

To set up products without component traceability:

1. In Material Maintenance, create material records for parents and components. If you are planning use Inventory Receipt to receive some components, use the type Manufactured/Purchased or Purchased for them.
2. In Material Group Maintenance, assign materials to material groups, if desired.
3. In BOM Maintenance, create BOMs for parent materials by listing component materials.
4. In Material Maintenance, associate BOMs with material records for parents.

Note: If desired, allow operators to create Trackable SFCs.

5. In System Rule Maintenance, set product-related system rules as needed.
6. If you are using RMA, if needed, create additional fields for data collection in the RMA category of Data Type Maintenance.
7. In Next Number Maintenance, create any necessary numbering patterns for products and components.
8. In POD Maintenance, if necessary, add functionality to existing PODs to allow operators to work with SFCs.

Once products are set up, shop floor personnel can create and release shop orders, or create and release SFCs. Use the Create and Release SFC activity (DM500) to create and release SFCs directly. When you release demand for product (shop orders and SFCs or just SFCs), the system and places the SFCs in queue at the first step on the specified routing.

5.2 Setting Up Products with Component Traceability

To set up products with component traceability:

1. Complete the steps for setting up products without component traceability.
2. If you want to validate numbers during the component assembly data collection process:
 - Create masks for materials using Validation Mask Maintenance.
 - Specify the validation mask group for a particular material on the Build tab of Material Maintenance and/or on the Main tab of Material Group Maintenance. The mask group you select in Material Maintenance takes precedence over the mask group you select in Material Group Maintenance.
 - Set up the Check Serial Number (EN521) activity hook to perform mask validation.
3. In Data Field Assignment Maintenance create the fields and data types for collecting information about components, as needed.

Note: If you want to validate collected assembly data for components, specify the activity you want to use to validate the assembly data in the **Pre-Save Activity** field of Data Field Definition Maintenance or Data Field Assignment Maintenance.

4. In Material Maintenance or BOM Maintenance, assign data types to component records. The data types you select in BOM Maintenance take precedence over the data types you select in Material Maintenance.
-

Note: If desired, allow operators to create Trackable SFCs and set up Component Usage Control.

-
5. To set up manual/discrete component traceability, add assembly point functionality to existing PODs to allow operators to record information about components as they assemble SFCs.
 6. If you track assembly at production machines, set up time-based component traceability.
 7. In the Assembly Operation row for the component in BOM Maintenance, specify the operation where operators assemble this component.

Once products are set up with component traceability, lead operators or other shop floor personnel can use As-Built Configuration to remove and replace components from already assembled product.

5.3 Setting Up Time-Based Component Traceability (TBCT)

To set up TBCT:

1. In System Rule Maintenance, do one of the following:
 - Set the *Track Resource Time* system rule to **Yes - Retain Details**.
 - Set the *Time-Based Resource* system rule to **true**.

Note: You can override these resource settings in Resource Maintenance.

For more information about system rules, see the SAP ME online help for System Rule Maintenance.

2. If the system is creating SFCs for this resource, in Resource Setup, tell the system what materials and shop order can be built on this resource.
3. In Slot Configuration Maintenance, define slot configurations.

Once TBCT is set up, operators on the shop floor can:

- Use Resource Slot Config Setup to associate the defined slot configurations with a resource, and to work with slot configurations at a resource.

Note: The SAP ME online help assumes shop floor personnel use Resource Slot Config Setup.

-
- Use Resource Slot Config Setup or Load or Replenish to load or replenish the slots on a resource, and collect desired component assembly data.
 - Use Resource Setup to change the setup state of a resource.

5.4 Enabling Operators to Create Trackable SFCs

To set up the Create Trackable SFC feature:

1. In System Rule Maintenance, enter the default shop order for Trackable SFCs in the *Default Shop Order for Trackable SFCs* system rule. If desired, set the *Track Inventory* system rule to **true**.
2. In Material Maintenance, create a record for the non-local component and select Manufacture/Purchased in the **Type** field. On the Build tab, select the **Trackable Component** check box and set the **Data to Collect on Assembly** list to Inventory ID (INV).

Note: The data type you associate with a component that allows Trackable SFCs must have a field in which the operator can enter the SFC number.

3. If you want to allow operators to create Trackable SFCs in Assembly Point (CT500) or when they add components in the POD or in As-Built Configuration, on the Details window for the component in BOM Maintenance select Material Default or True in the **Trackable Component** field. For more information, see the SAP ME online help for BOM Maintenance.
4. If you want to require operators to enter a shop order in Create Trackable SFC, on the Rules tab in Activity Maintenance, retrieve Create Trackable SFC (PR300) and enter FALSE in the Setting column for the REQUIRE_SHOP_ORDER option.

When an operator enters values in Create Trackable SFC and clicks **Create SFC**, the system creates the SFC record and sets its status to either Done or In Queue.

When an operator enters the SFC number of a Trackable SFC component in Assembly Point or when he or she adds a component in the POD or in As-Built Configuration, the system creates the SFC record and sets its status to Done.

5.5 Setting Up Component Usage Control

To set up component usage control:

1. In System Rule Maintenance, set the following system rules for your shop floor. See the SAP ME online help for System Rule Maintenance more information.
 - Validate Component Usage
 - Max Component Usage Count
 - Max Component Usage Event
2. If you want to override the maximum usage count for a specific component, specify this value in the **Max Usage as Component** field on the Main tab in Material Maintenance.
3. If you want to override the maximum usage count for a specific component in a BOM, specify this value in the **Max Usage as Component** field on the Main tab in the Component Details window for the component in BOM Maintenance.

When a user attempts to add a component that has exceeded its usage count in Assembly Point or AsBuilt Configuration, the system prevents the addition and responds according to your settings. Users who have access to Component Usage Reset may override your settings.

5.6 Creating and Releasing Shop Orders

5.6.1 Production and Repetitive Shop Orders

For Production and Repetitive shop orders, have users do one of the following:

1. In Shop Order Maintenance, create one or more shop orders. In Shop Order Release, retrieve the shop order and release demand for it.
2. To release SFCs upon demand, use Create and Release SFC.

5.6.2 RMA Shop Orders

For RMA shop orders, have users do the following:

1. In Shop Order Maintenance, create one or more RMA shop orders.
2. In RMA Shop Order Receipt associate an RMA number with the shop order and enter data about the RMA.
3. In RMA SFC Receipt reuse or generate SFCs for the RMA shop order.

6 Usage Scenario Examples

None provided.

7 Links to Additional Information

[SAP ME online Help](#)

8 Other Reference Material

SAP ME How-To-Guide – POD

SAP ME How-To-Guide – Setting up Production Lines

SAP ME How-To-Guide – Setting up Activity Hooks

SAP ME How-To-Guide – Setting up Activity Rules

SAP ME How-To-Guide – Visual Test and Repair (VTR)

9 Overview of Changes

In SAP ME 6.0, the Kit functionality was replaced with a new Phantom BOM capability.