SAP Manufacturing Execution

How-To Guide



How To Set Up and Use the SAP ME Assembly Feature

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1 Introduction

1.1 Purpose

The purpose of this document is to describe the Assembly Point Activity, in both Choose and Sequence Mode that currently exists in SAP ME. This document outlines the business logic, pre-conditions and provides description from the user perspective.

Assembly Point is the process to collect assembly data on a SFC or group of SFC(s). Assembly data can be collected and applied to SFC(s) with common assembly requirements as a group. This function supports both serialized and non-serialized SFC(s).

1.2 Scope

This How-To-Guide covers all aspects of the Assembly (Assembly Point) features and the activities in SAP ME.

1.3 Glossary

SFC - A unique identifier representing a specific instance of a particular material being built during the manufacturing process.

The shop floor control (SFC) number can have a quantity of one (serialized) or greater than one (non-serialized). If the SFC number has a quantity of one, it can represent the unique number of a material being built. If the SFC number has a quantity greater than one, it can represent the lot of a material being built.

For example, PRINT900 is a material produced by the ABC plant.

The SFC number PRINT900-00001 represents the specific instance of PRINT900 that is currently being built.

TSM - Time Sensitive Material - refers to materials having physical or process characteristics directly impacted by time exposure.

Time-Based Component - A time-based component material type indicates that the material is assembled onto a product on a specific resource during a specific time period. A time-based component has a unique inventory ID loaded onto a resource and SFC numbers are processed on this resource. A time-based component can be normal, splice, or continuous. A normal time-based component has an inventory ID that is empty and replenished with another inventory ID. A splice time-based component has an inventory ID that is loaded on a reel and before the inventory ID is empty, another inventory ID is spliced onto the same reel. In this case, both inventory IDs are recorded until the consumption tolerance has been reached. In the case of a continuous time-based component, an inventory ID continues to be

logged even though the manufacturing process has consumed it. This is the case where the component has residue that remains on the resource until the resource is cleaned and the entire configuration is unloaded.

WIP - Work In Process.

Traceability - the ability to verify the history, location, or application of an item (Material, SFC) by means of documented recorded identification.

As-Built - This activity validates the location, reservation, and time-sensitive key attributes before the material can be consumed by an SFC number.

Component - The raw material, part, or subassembly that goes into a higher-level assembly.

Assembly Point – An activity to record assembly work on the shop floor and to enter assembly data values for components at an assembly point operation for one or more SFC numbers.

2 Assembly Overview

2.1 Description and Applicability

Assembly Point is the process to collect assembly data on a SFC or group of SFC(s). SFC(s) with common assembly requirements can be collected and applied as a group. This function supports both serialized and non-serialized SFC(s).

An assembly point occurs at an operation where shop personnel assemble components to build a product. Assembly points occur only when the component has data to collect about them. If there is no data to collect the components will be considered as auto-assembled and Assembly Point will not appear. The *Assembly Point* activity allows you to record assembly data for each component that goes into an assembly. These assembly data records provide the key link to the genealogy records for product during manufacturing. As quality issues are found, these records provide the SFC numbers that could be affected by a component defect and can reduce the number of SFC numbers that must be repaired or recalled.

When you use manual/discrete component traceability, you can track information about components in both discrete and time-based. The difference is that with discrete the assembly data is entered manually or scanned by operators. An assembly record is created for a unique instance of an SFC number that is built in manufacturing.

The *Assembly Point* activity can validate the location, reservation (Floor Stock Receipt), and time-sensitive key attributes before the material can be consumed by an SFC number (see Material).

It supports the consumption of serialized or non-serialized components.

When a component needs to be removed or replaced, or non-BOM component needs to be assembled, As-*Built Configuration* is used (see As-Built Configuration in SAP ME Help).

The Assembly Point functionality is used in standard **Operation POD** and **Work Center POD** scenarios and provides Component List and Assembly Data Entry plug-ins in place of the Active Worklist to allow a User to collect Assembly data against components on an SFC. This can be configured to be launched in different ways from any POD, if needed. If you use barcode scanner you may not need to show components list.

The Assemble Activity has been configured with Component List plug-in and the Assemble Components plug-in and is tightly integrated to the Operation Selection List. By default this function has been configured and applied to the Default Operation and Work Center POD's in the standard SAP ME configuration.

The Assembly MODE can be set up to be CHOOSE or SEQUENCE.

2.2 Process

1. In *Data Field Definition Maintenance*, you define the fields to be entered with data when material component is assembled. You can also attach a pre-save validation activity that is executed during the collection of the data field value to assure the value passes validation. In *Data Field Assignment Maintenance*, you group these data fields and associate those with a data type of *Assembly* category (see Assembly Data Type). In addition you can define another pre-save validation activity for all data fields in the data type group. Further, you can validate the format of the data value (see Setting Up Mask Validation for Assembly Data Types).

2. In *Material Maintenance*, you assign the data type to be collected on assembly.

3. In *Routing Maintenance*, you define operations where components are assembled.

4. In *BOM Maintenance*, you define a BOM for the assembly and assign the material and quantity to be assembled at a routing operation. This operation is then realized as an assembly operation or where components are consumed. On the *Component Details* screen, an assembly data type can be assigned to a component.

5. In *Activity Maintenance*, you have to point the activity CT500 for which you define you define the assembly mode, whether components must be assembled or may be skipped as defined by the assembly sequence or whether components can be assembled as selected by the manufacturing personnel. Further, you define if component consumption is enforced at the assembly operation in the BOM and an SFC number has the correct status at the assembly operation (see Assembly Point (Assemble Components))

6. In POD Maintenance you have to configure this activity to be launched at Start of standalone button

2.2.1 Assembly Point (Assemble Components) CT500

You use this activity to record assembly work on the shop floor and to enter assembly data values for the material at an assembly point operation for one or more SFC numbers. Typically this Activity is configured as a Button on a POD. To do this, assign the CT500 activity to your POD where Assembly Operations will be processed. In POD Maintenance on the Buttons tab, Assign CT500 as a button (with the Component list) (Figure 1), and on the Layout Tab, assign the Component List to a Fixed area (or Popover or Popup) (Figure 2)

Figure 1 Assembly setup as a Button in a POD

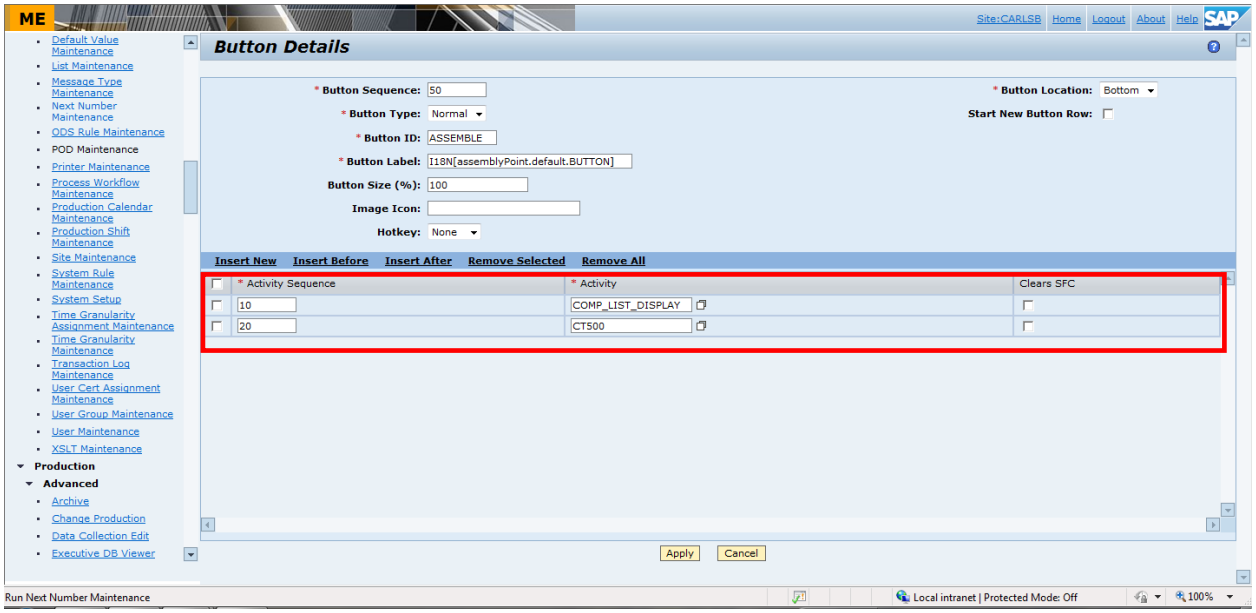
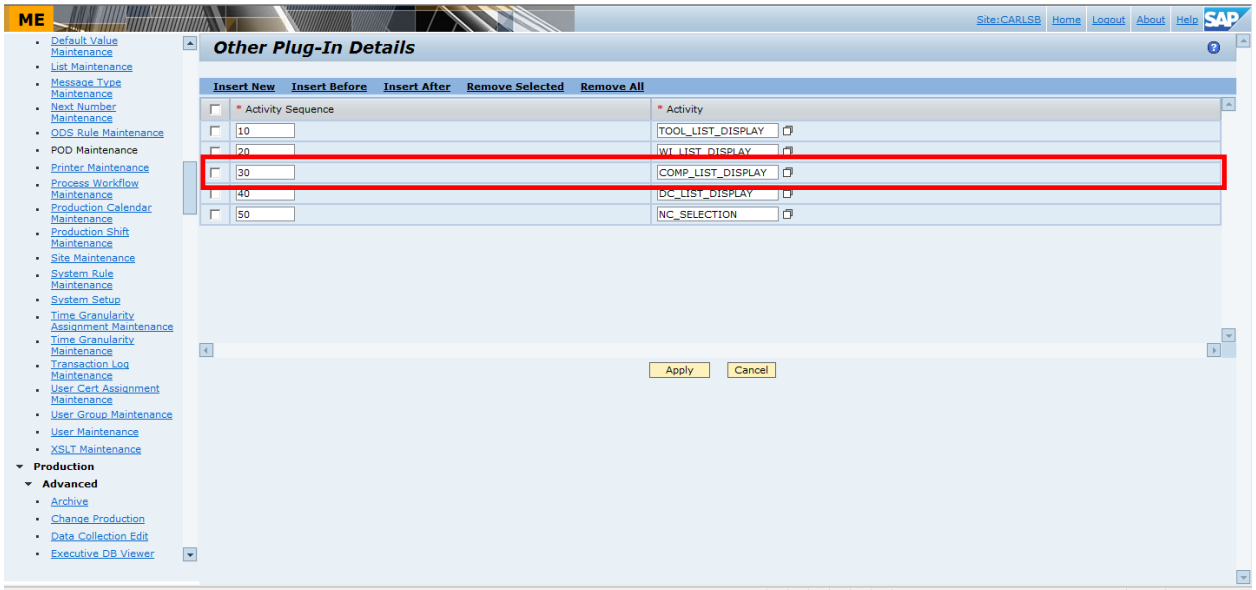


Figure 2 Component List on Layout Tab for a POD



To record the removal of components or the assembly of non-BOM components, use *As-Built Configuration* (see As-Built Configuration).

This activity can be used with the PARSE_COMPONENT activity hook point (see Hook Points).

2.2.1.1 Hook Points

The system can execute hook point activities at several different points in time. These points in time are called hook points. Hook points allow you to precisely control when the system executes hook point activities.

The system has one set of hook points at the object level and another set at the site level.

NOTE: THE SYSTEM EXECUTES ALL CODES ASSOCIATED WITH A HOOK POINT IN THE SAME DATABASE TRANSACTION. FOR HOOK POINTS WITHIN POD PUSHBUTTON ACTIVITIES, THE TRANSACTION INCLUDES A SINGLE PUSHBUTTON ACTIVITY, SUCH AS *START* (PR500). IF THE HOOK POINT ACTIVITY FAILS, THE SYSTEM ROLLS BACK, OR CANCELS, THE ENTIRE TRANSACTION. FOR EXAMPLE, IN THE FIGURE IN SITE LEVEL HOOK POINTS, IF YOU ASSOCIATE ***CHECK CONFIGURATION*** **(CT520)** WITH THE POST_START HOOK POINT AND THE COMPONENTS HAVE NOT BEEN ASSEMBLED, THE SYSTEM ROLLS BACK THE *START* AS WELL. THIS IS TRUE FOR ALL HOOK POINTS.

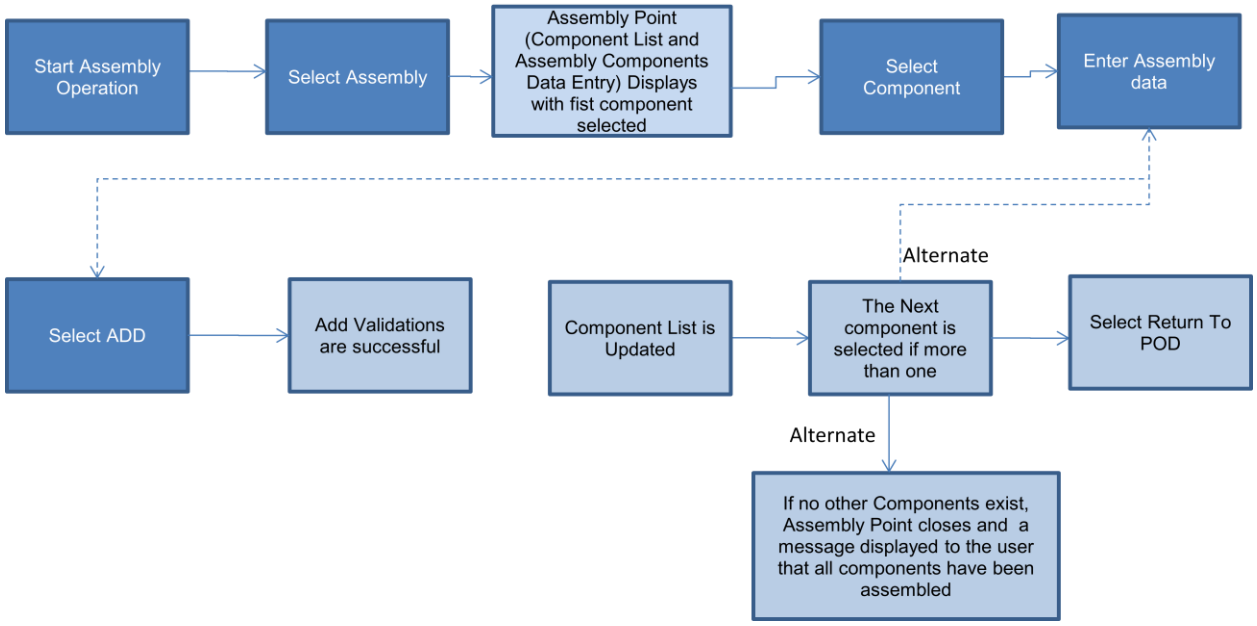
2.3 Business Purposes / Functions

The Assembly Point (CT500) functions are used to provide a mechanism for the users working at an Operation to collect Assembly information on one-to-many SFC's at a time. The Assembly Point GUI display is defined in POD Maintenance. 2D Barcode scanning may be utilized to

perform the Data Collection function for a component, during the assembly process (see section 5.3.3.3 for more information on 2D Barcode Scanning). Also TSM Functionality may be utilized as part of the Assembly process when the Component has been identified as a TSM component in Material Maintenance (See section 6.3 for Usage scenarios, and also the How to Guide; SAP ME How-To-Guide for Time Sensitive Material)

2.4 High-Level Process Flows

This figure illustrates the primary flow of user actions when selecting Assembly Activity, to be used in SAP ME.



2.5 Best Practices

The default Assembly activities may be configured as a standalone button that can be applied to any POD configuration or as an Activity in the Activities List. The Assembly Activity configuration has been configured by default and applied to the Default Operation POD and Default Work Center POD. Use this setup and configuration as an example, when applying the Assembly functions to any customized POD and where the need to assemble components presents itself for a unique implementation. To do this, simply retrieve the CT500 activity in the Activity Manager and rename and save the new activity, then modify and configure to suit your needs. Then you have to use the modified activity in the pod.

2.6 Preconditions

Assembly Data Type

An assembly data type value has been assigned to a component either through Material or BOM Maintenance.

Operation field in POD

An operation value is displayed in the Operation field and must be the same as the assembly operation in the BOM for assembly point to validate.

Resource field in POD

A resource value is displayed in the Resource field.

SFC field in POD

One SFC or [X number of SFC selected] is displayed in the SFC field.

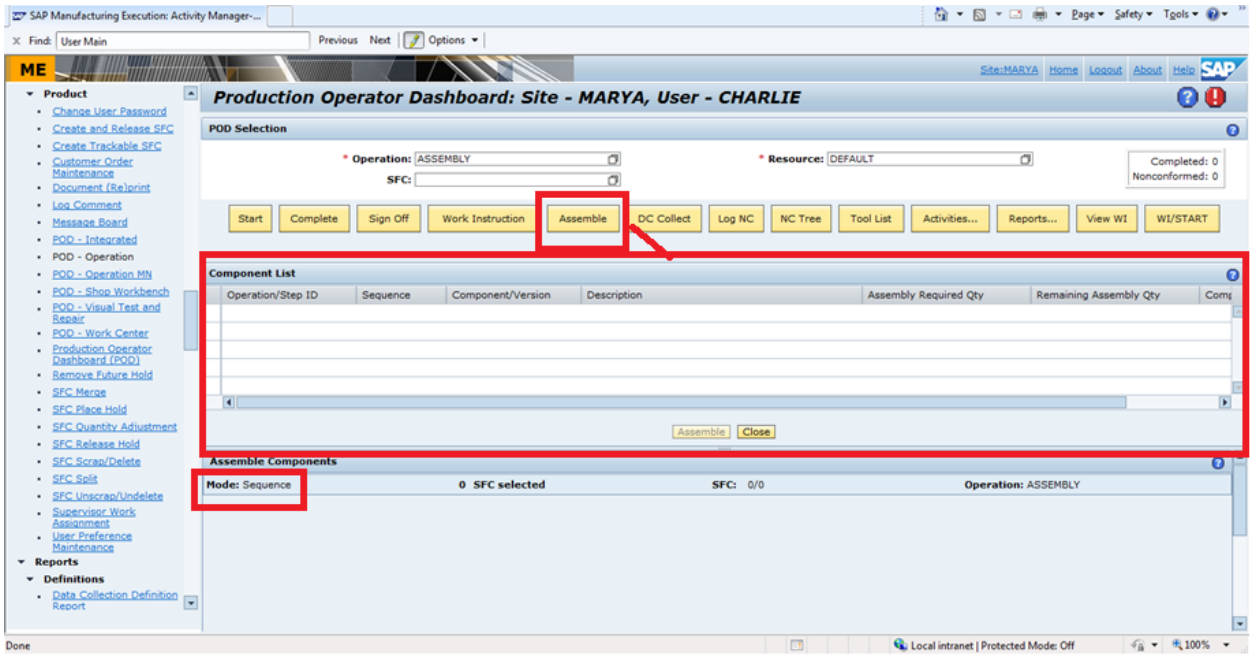
The SFC must be 'in work' to be processed at an assembly operation when the new activity rule is yes.

3 POD Processing

3.1.1 Description and Applicability

You use the Assembly Point activity in a POD to record assembly work on the shop floor and to enter assembly data values for the material at an assembly point operation for one or more SFC numbers. You use the Component List activity to view the list of all the components defined in the BOM which then will be filtered to the current or selected operations for the selected SFC number in the POD. This allows the user to efficiently capture the data needed during the assembly of components for and SFC at the specified Operation and to collect the appropriate data during the assembly process. This ensures that the operator is performing the assembly operation in a complete and concise manner.

Figure 3 Assemble Plug-in's in the POD you need a screen with data. This is not the best example



Assemble Button in Component List

- This button will always be displayed as the Assemble button in the Component List plug-in in the POD.

Execute before or after Start activity through button details.

- The Assembly Point activity will be executed upon successful completion of the start activity when the activity is included in the button definition for the start activity. The Assembly Point plug-in is displayed in the bottom portion (static frame) of the existing POD.
- In the POD, the Component List plug-in is displayed as either a pop-over, a pop-up dialogue, or replaces one of the static panels.

Execute before or after complete activity through button details

- The Assembly Point activity will be executed upon successful completion of the complete activity if the Assembly Point activity is included in the button definition for the complete activity. The Assembly Point plug-in replaces the Active Work List in the bottom of the existing POD.
- In the POD, the Component List plug-in is displayed as either a pop-over, a pop-up dialogue, or replaces one of the static panels.

Can be defined as a standalone alone button

- The Assembly Point plug-in appears in the lower frame of the POD for SFC(s) that are either selected from the Task or Active Work List in the bottom of the existing POD.
- In the POD, the Component List plug-in is displayed as either a pop-over, a pop-up dialogue, or replaces one of the static panels.

Can be defined as an activity in the Activities button

- The Assembly Point plug-in appears in the lower frame of the POD for SFC(s) that are either selected from the Task or Active Work List.
- In the POD, the Component List plug-in is displayed as either a pop-over, a pop-up dialogue, or replaces one of the static panels.

Example

1. User submits Assembly Point (Button or Activity List selection) activity

The user has submitted the Assembly Point activity in the Default Component Assembly List.

2. Assembly Point Modal Window Displayed

Upon submission of the assemble activity, the POD Assembly Point GUI will be displayed.

3. Component Details & Assembly Data Entry Fields Displayed

The first select component from the Component List will appear in the Component Details, as well as the assigned assembly data fields for the component. The cursor will appear in the first assembly data field.

4. Selection of Assembly Data Value

The user manually enters or selects the assembly data value from the browse.

5. The User selects the Add button.

Upon successful input of assembly data values, the user will submit the add activity. The Add validations are successful. The next selected component may be displayed dependent upon the auto_next activity rule. If no components remain to be assembled, the Assembly Point UI will close and the user is returned to the POD. The Component List is updated

All components are assembled the Component icon includes a check mark in the Work Queue and/or Operation List Info column.

If all components are not assembled, the Component icon remains the same.

6. User Submits Return to POD.

3.1.2 Best Practices

Begin with the default configurations and settings as a base and modify and save the activities to suit your business processing needs for assembly in SAP ME.

4 Integration

4.1 Web Service

For information regarding Assembly integration using Web Services, please refer to the Web Services Guide for SAP ME 6.0. Legacy ME 6.0 Web Services Guide is currently available on SMP (Service Marketplace): https://websmp103.sap-ag.de/~form/sapnet?_SHORTKEY=01100035870000740232&.

From the document:

Assemble Components

The Assemble Components operation assembles the given components or SFCs on the top-level assembly.

It is possible to have a partial success with this message where some components were successfully assembled while others were not.

For more information, see the help topic for Assembly Point (Assemble Components).

Request: AssembleComponentsRequest_sync

The following table lists and describes the elements that are used in the Assemble Components request.

Element Name

Element Description

Required?

<me:CheckOperation>

Validates the operation for the component in the BOM; must be true for this request

Yes

<me:Event>

The message to be identified in the Activity Log Entry; should be baseFinished:AssemblyPoint for this request

Yes

<me:AssembleIdentifier>

The list of identifiers (components or inventory IDs) to assemble See <me:AssembleComponentsRequestIdentifierObject> in the Appendix A: Ref Elements

Yes

<me:OperationRef>

The operation at which the assembly takes place See <me:OperationRef> in the Appendix A: Ref Elements

Yes

<me:ParentSfc>

The SFC for the top-level assembly See <me:SfcRef> in the Appendix A: Ref Elements

Yes

<me:ResourceRef>

Reference to the resource at which the assembly takes place.

No

<me:SiteRef>

The site to which the SFC belongs See <me:SiteRef> in the Appendix A: Ref Elements

Yes

<me:UserRef>

The user to log on See <me:UserRef> in the Appendix A: Ref Elements

Yes

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Response: AssembleComponentsConfirmation_sync

The following table lists and describes the elements that are used in the Assemble Components response.

NOTE

It is possible to have a partial success where some components were successfully assembled while others were not (reported in this list).

Element Name

Element Description

<me:Error>

The error message

<me:Identifier>

The component that failed.

<me:RefDes>

The reference designator for the component that failed.

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AssembleComponentsTransactional

The Assemble Components Transactional operation assembles the given components or SFCs on the top-level assembly.

It is not possible to have a partial success with this message. All components are assembled in one transaction. All components are assembled in one transaction.

In contrast to AssembleComponents, AssembleComponentTransactional aborts on the first error and rolls back the transaction.

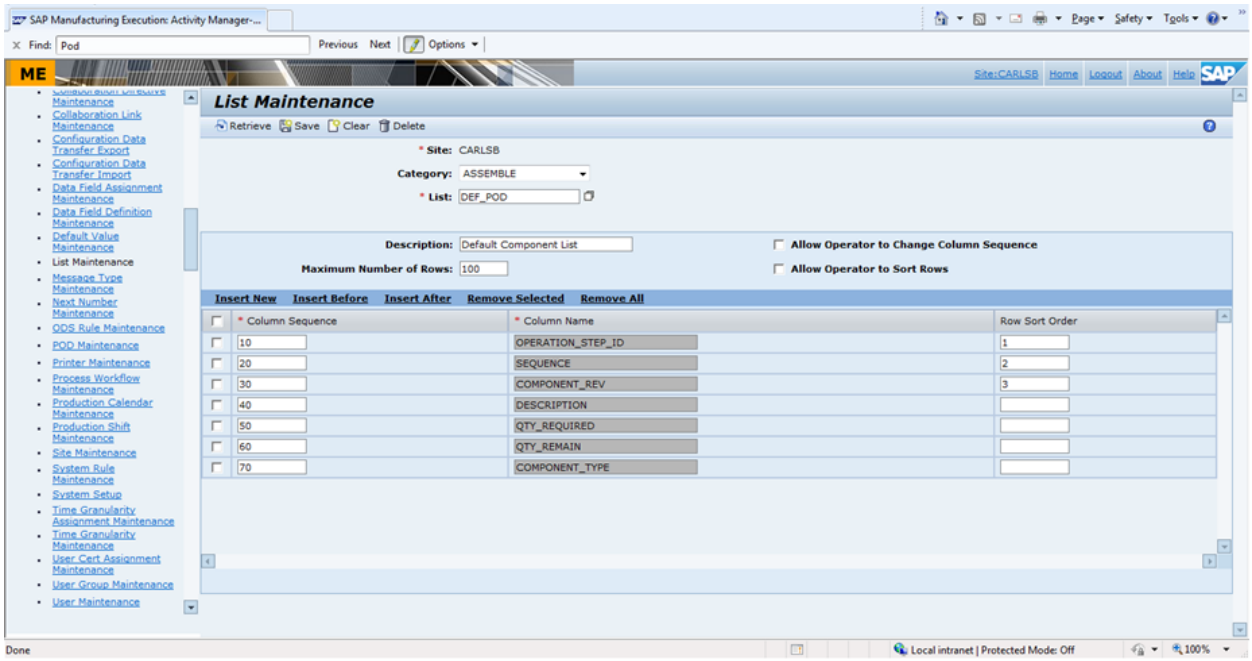
Request: AssembleComponentsTransactionalRequest_sync

See the table for AssembleComponentsRequest_sync for a description of the elements in the request.

5 Assembly Setup and Configuration

5.1 Assembly Lists

Lists to be used in assembly should be defined in List Maintenance. Default Assembly lists have been provided out of the box. The screen shot below shows the default list configuration for the Category List Assembly.



5.2 Assembly Data Type Maintenance

An assembly data type value has been assigned to a component either through Item or BOM Maintenance via the fields on the build tab.

Data to Collect on Assembly: Default: NONE

Data to Collect on Removal: Default: NONE

5.3 POD

At a minimum the CT500 and COMP_LIST_DISPLAY activities must be configured (or accept the defaults) and applied to a POD either as a Button or Activities List activity. These activities should also be assigned to a layout (popover, popup or fixed panel).

5.3.1 POD Assembly Lists

Assembly lists must be referenced though the options tab in POD Maintenance. Default lists have been provided out of the box.

5.3.2 CT500

At the very least has been configured and applied to an Operation or Work Center POD. The default activity configuration is as follows:

Setting	Activity	Description	Default Value
ALLOW_SKIP	CT500	If YES – it will allow the user to skip a component while in sequence mode. If NO – it will force all components to be assembled according to the BOM sequence. This activity rule only applies if the ASSEMBLY_MODE rule is SEQUENCE.	NO
ASSEMBLY_MODE	CT500	Sequence – the order components must be assembled is through the BOM sequence Choose – the order of components to be assembled is selected by the user.	CHOOSE
DISPLAY_ASSEMBLY_DATA	CT500	Indicates of the assembly data fields for a component is displayed in the plug-in if the assembly mode is CHOOSE Only. TRUE – displays assembly data fields FALSE – displays assembly data fields except for component, SFC, Inventory_ID, or Inventory_ID_SFC	TRUE
AUTO_NEXT	CT500	If YES - The next component in the component list is automatically displayed during assembly point. If NO – Only the component selected from the component list is displayed during assembly point.	YES
DISPLAY_BARCODE	CT500	If YES – The Barcode field will be displayed below the Choose field. If NO – the barcode field is not displayed	YES
ENFORCE_ASSY_STATES	CT500	TRUE – the selected SFC(s) must be follows the behavior described in section 8.1.3 FALSE – the selected SFC(s) will follow the current behavior of assembly point and will not follow the rules described in section 8.1.3.	FALSE

5.3.3 COMP_LIST_DISPLAY

At a minimum the COMP_LIST_DISPLAY activity should be configured as follows:

Activity Rules

Setting	Activity	Description	Default Value
DATA_ENTRY_PLUGIN_ID		CT500	NO
PLUGIN_URL		/COM/SAP/ME/PRODUCTION/CLIENT/COMPONENTLIST.JSPURL (needs to be in lower case, or it won't work)	CHOOSE

5.3.3.1 Purpose / Effects

Allows for the use of the Assembly Point default functionality to be used, out of the box.

5.3.3.2 System Rules

5.3.3.2.1 Purpose / Effects

There are System Rules that should be configured and set by default. The list below describes the rules and default settings:

All of these rules are found in the Component Traceability System Rule Group. All system rules apply to Rich and Simple POD.

System Rule	Value	Default Site Value	Fields Affected
Allow Rev Change on Purchased Components	True – allows component revision to be changed during assembly point False – does not allow component revision to be changed	Use Global Setting	Revision field in assembly point and as built.
Display Auto Fill Components	True – displays auto filled components at the bottom of the BOM Component Table False – does not display	Use Global Setting	BOM Component Table in Assembly Point

System Rule	Value	Default Site Value	Fields Affected
Enforce Pegging on Consumption	True – allows only an SFC from a component subassembly to be assembled onto a top-level SFC False – allows any SFC from a component subassembly to be assembled onto a top-level SFC	Use Global Setting	Assembly data fields in Assembly Point and As built
Max Component Usage Count	Value determines how many times a component/assembly data can be consumed.	Use Global Setting	Assembly data fields in Assembly Point and As built
Max Component Usage Event	Value determines what event occurs when the max component usage count is exceeded	Use Global Setting	Assembly data fields in Assembly Point and As built
Validate Component Usage	True – determines if the number of times a component has been consumed is enforced False – does not look at the count.	Use Global Setting	Assembly data fields in Assembly Point and As built

5.3.3.3 Two-Dimensional (2D) Barcode Data Collection

You can use this function to collect data about a material by scanning 2D barcodes when assembling a component on the shop floor or receiving a material to floor stock.

5.3.3.4 Prerequisites

- You have defined the barcode data format in *Barcode Data Format Maintenance* (see Barcode Data Format Maintenance).
- You have associated the BARCODE_PARSER hook point activity with either a site or a material (see Barcode Parser).
- You have defined data to collect on assembly, removal, and floor stock receipt on the *Build* tab page of *Material Maintenance*.
- You have set the DISPLAY_BARCODE activity rule for *As-Built Configuration*, *Maintain Floor Stock* and *Floor Stock Receipt to* YES in *Activity Maintenance*.
- You have configured 2D barcode scanners to work with SAP ME.

5.3.3.5 Activities

- A shop floor operator scans a 2D barcode on a component and tabs out.
- The system parses the barcode and does one of the following:
    - Populates data in the *Data to Collect on Assembly* or *Data to Collect on Removal* fields on the *As-Built Configuration* screen (see As-Built Configuration)
    - Populates data in the *Data to Collect on Floor Stock Receipt* fields on the *Floor Stock Receipt* or *Maintain Floor Stock* screen (see Floor Stock Receipt and Maintain Floor Stock).

5.3.4 Process

1. In *Data Field Definition Maintenance*, you define the fields for data to be collected when material is assembled. You can also attach a pre-save validation activity that is executed during the collection of the data field value to assure the value passes validation. In *Data Field Assignment Maintenance*, you group these data fields and associate them with a data type of *Assembly* category (see Assembly Data Type). In addition you can define another pre-save validation activity for all data fields in the data type group. Further, you can validate the format of the data value (see Setting Up Mask Validation for Assembly Data Types).

2. In *Material Maintenance*, you assign the data type to be collected on assembly.

3. In *Routing Maintenance*, you define operations where components are assembled.

4. In *BOM Maintenance*, you define a BOM for the assembly and assign the material and quantity to be assembled at a routing operation. This operation is then realized as an assembly operation or where components are consumed. On the *Component Details* screen, an assembly data type can be assigned to a component.

   In *Activity Maintenance*, you define the assembly mode, whether components must be assembled or may be skipped as defined by the assembly sequence or whether components can be assembled as selected by the manufacturing personnel. Further, you define if component consumption is enforced at the assembly operation in the BOM and an SFC number has the correct status at the assembly operation (see Assembly Point (Assemble Components))

6 User Scenarios

6.1.1 Example Scenarios

I. Operation POD Scenarios

A. Component List and Data Entry replace Active Work List which is displayed
   1. User enters Operation value
   2. User enters Resource value
   3. User has 1 SFC displayed in the SFC Field
   4. User submits the Assemble Action (this button is configured to open the Component List and the Assemble Component Data Entry plug-in).
      i. When the Assemble action is submitted the activity rules for both activities must be checked.
   5. If the Mode is SEQUENCE and all activity rules are validated the following occur:
      i. The component list shows all components for the selected operation, ordered by assembly sequence from the BOM.
      ii. The first component with the lowest assembly sequence at the operation should be selected in the Component List.

iii. The Assemble Component Data Entry plug-in will also be opened and the selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.

6. The user will enter values in the assembly data fields.
7. The user will submit the “Add” action.
    i. All Add business logic occurs and passes.
8. If there are more components to be assembled at the operation, the next assembly sequence component is automatically selected in the Component List, and the Data Entry plug-in is refreshed with this new component details and assembly data fields.
9. If there are no further components to be assembled at the operation, the Component List and Data Entry plug-ins shall close and the Operation POD should return to the default plug-in state.

B. Component List and Data Entry replace Active Work List which is displayed
    1. Repeat steps 1 through 4 in A.
    2. If the Mode is CHOOSE and all activity rules are validated the following occur:
        i. The component list shows all components for the selected operation, ordered by assembly sequence from the BOM. No component is selected.
        ii. The Data Entry plug-in is opened in a default state.
    3. The user selects a component in the Component List.
    4. The Choose field in the Data Entry plug-in displays this component.
        i. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
    5. The user will enter values in the assembly data fields.
    6. The user will submit the “add” action.
        i. All Add business logic occurs and passes.
    7. The Data Entry plug-in will go back to the default state and the cursor will in the Choose field.
    8. The user will enter the next component to be assembled in the Choose field and will tab out of the field.
        i. Alternate flow: the user selects a component row in the Component List; Step 4 in this flow occurs.
    9. The component will be selected in the Component List.
    10. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
    11. The user will repeat steps 5 and 6.
    12. If there are no further components to be assembled at the operation, the Component List and Data Entry plug-ins shall close and the Operation POD should return to the default plug-in state.

C. Component List and Data Entry replace Active Work List which is displayed
    1. Repeat steps 1 through 4.
    2. If the Mode is CHOOSE_AUTO_NEXT and all activity rules are validated the following occur:
        i. The component list shows all components for the selected operation, ordered by assembly sequence from the BOM. No component is selected.
        ii. The Data Entry plug-in is opened in a default state.
    3. The user selects a component in the Component List.
    4. The Choose field in the Data Entry plug-in displays this component.
        i. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
    5. The user will enter values in the assembly data fields.
    6. The user will submit the “add” action.
        i. All Add business logic occurs and passes.
    7. The next component in the Component list is automatically selected.
    8. Step 4 in this flow is repeated.
    9. The user will repeat steps 5 through 6.
    10. If there are no further components to be assembled at the operation, the Component List and Data Entry plug-ins shall close and the Operation POD should return to the default plug-in state.

D. Component List and Data Entry are fixed default panels in the POD
   1. The user has opened the POD.
   2. The Component List Header with no empty rows is displayed in the plug-in.
   3. The Data Entry Default plug-in is displayed.
   4. User enters Operation value.
   5. User enters Resource value.
   6. User has 1 SFC displayed in the SFC Field and the user tabs out of this field.
   7. The activity rules for both activities must be checked.
   8. If the Mode is SEQUENCE and all activity rules are validated the following occur:
      i. The component list shows all components for the selected operation, ordered by assembly sequence from the BOM.
      ii. The first component with the lowest assembly sequence at the operation should be selected in the Component List.
      iii. The selected component details will be displayed on the left side of the Data Entry plug-in AND the assembly data fields will be displayed in the right side.
      iv. Steps 11 and 12 occur below.
      v. If there are more components to be assembled at the operation, the next assembly sequence component is automatically selected in the Component List, and the Data Entry plug-in is refreshed with this new component details and assembly data fields.
   9. If the Mode is CHOOSE and all activity rules are validated the following occur:
      i. The component list shows all components for the selected operation, ordered by assembly sequence from the BOM. No component is selected.
      ii. The user selects one component in the Component List.
      iii. The Choose field in the Data Entry plug-in displays this component.
      iv. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
      v. Steps 11 and 12 occur below.
      vi. The Data Entry plug-in will go back to the default state and the cursor will in the Choose field.
      vii. The user will enter the next component to be assembled and tab out of the field.
      viii. The component will be selected in the Component List.
      ix. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
   10. If the Mode is CHOOSE_AUTO_NEXT and all activity rules are validated the following occur:
      i. The component list shows all components for the selected operation, ordered by assembly sequence from the BOM. No component is selected.
      ii. The user selects one component in the Component List.
      iii. The Choose field in the Data Entry plug-in displays this component.
      iv. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
      v. Steps 11 and 12 occur below.
      vi. The Data Entry plug-in will go back to the default state and the cursor will in the Choose field.
      vii. The next component is the list is automatically selected in the Component List.
      viii. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
   11. The user will enter values in the assembly data fields.
   12. The user will submit the “add” action.

i. All Add business logic occurs and passes.

13. If there are more components to be assembled, see each flow above.
14. If there are no further components to be assembled at the operation, the Component List and Data Entry plug-ins shall return to the default plug-in state.

E. Only Component List is displayed
   1. User enters Operation value
   2. User enters Resource value
   3. User has 1 SFC displayed in the SFC Field
   4. User submits the Assemble action (this button is configured to open the Component List in a defined panel)
   5. No activity rules for the Component List are checked at this time.
   6. The Component List will be displayed and ordered by the assembly sequence in the BOM for the selected SFC.
   7. The user selects a component from the list.
   8. The user submits the Assemble button in the Component List plug-in.
      i. When the Assemble action is submitted the activity rules for both activities must be checked.
         1. These rules determine the mode of assembly and what Data Entry plug-in will be opened.
   9. If the Mode is SEQUENCE and all activity rules are validated the following occur:
      i. The component list shows all components for the selected operation, ordered by assembly sequence from the BOM.
      ii. The first component with the lowest assembly sequence at the operation should be selected in the Component List.
      iii. The selected component details will be displayed on the left side of the Data Entry plug-in AND the assembly data fields will be displayed in the right side.
      iv. Steps 12 and 13 occur below.
      v. If there are more components to be assembled at the operation, the next assembly sequence component is automatically selected in the Component List, and the Data Entry plug-in is refreshed with this new component details and assembly data fields.
   10. If the Mode is CHOOSE and all activity rules are validated the following occur:
      i. The component list shows all components for the selected operation, ordered by assembly sequence from the BOM. No component is selected.
      ii. The user selects one component in the Component List.
      iii. The Choose field in the Data Entry plug-in displays this component.
      iv. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
      v. Steps 12 and 13 occur below.
      vi. The Data Entry plug-in will go back to the default stateand the cursor will in the Choose field.
      vii. The user will enter the next component to be assembled and tab out of the field.
      viii. The component will be selected in the Component List.
      ix. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
   11. If the Mode is CHOOSE_AUTO_NEXT and all activity rules are validated the following occur:
      i. The component list shows all components for the selected operation, ordered by assembly sequence from the BOM. No component is selected.
      ii. The user selects one component in the Component List.
      iii. The Choose field in the Data Entry plug-in displays this component.
      iv. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
      v. Steps 12 and 13 occur below.

vi. The Data Entry plug-in will go back to the default state and the cursor will in the Choose field.
vii. The next component is the list is automatically selected in the Component List.
viii. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.

12. The user will enter values in the assembly data fields.
13. The user will submit the "add" action.
    i. All Add business logic occurs and passes.
14. If there are more components to be assembled, see each flow above.
15. If there are no further components to be assembled at the operation, the Component List and Data Entry plug-ins shall return to the default plug-in state.

F. Assemble Component Data Entry only displayed

1. User enters Operation value
2. User enters Resource value
3. User has 1 SFC displayed in the SFC Field
4. User submits the Assemble Action (this button is configured to open the Assemble Component Data Entry)
    i. The defined Assemble Component Data Entry opens and all activity rules are read at this time.
5. If the Mode is SEQUENCE and all activity rules are validated the following occur:
    i. The first component with the lowest assembly sequence at the operation should be displayed in the component details on the left side of the Data Entry plug-in AND the assembly data fields will be displayed in the right side.
    ii. Steps 8 through 9 occur.
    iii. If there are more components to be assembled at the operation, the next assembly sequence component is automatically and the Data Entry plug-in is refreshed with this new component details and assembly data fields.
6. If the Mode is CHOOSE and all activity rules are validated the following occur:
    i. The Choose field in the Data Entry plug-in displays empty.
    ii. The user will enter the component to be assembled and tab out of the field.
    iii. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
    iv. Steps 8 through 9 occur.
7. If the Mode is CHOOSE_AUTO_NEXT and all activity rules are validated the following occur:
    i. The Choose field in the Data Entry plug-in displays empty.
    ii. The user enters a component in the choose field and tabs from the field.
    iii. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
    iv. Steps 8 through 9 occur.
    v. The next component for the operation will be automatically displayed in the Choose field.
    vi. The selected component details will be displayed on the left side of the plug-in AND the assembly data fields will be displayed in the right side.
8. The user will enter values in the assembly data fields.
9. The user will submit the "add" action.
    i. All Add business logic occurs and passes.

10. If there are more components to be assembled, see each flow above.
11. If there are no further components to be assembled at the operation, the Component List and Data Entry plug-ins shall return to the default plug-in state.

G. No Operation or Resource Values – Only Component List Display

1. User does not enter Operation value
2. User does not enter Resource value
3. User has 1 SFC displayed in the SFC Field
4. User submits the Assemble Action (this button is configured to open the Component List in a defined panel)
5. No activity rules for the Component List are checked at this time.
6. The Component List will be displayed and ordered by the assembly sequence in the BOM for the selected SFC. It will display all components
7. The user selects a component from the list.
8. The assemble button will not be enabled because an operation has not been selected.
9. User then enters an Operation value
10. User then enters a Resource Value
11. User has same SFC selected
12. The Component List should be refreshed to only display the components for the selected operation.
13. User submits the Assemble Action in the Component List and the activity rules for the data entry plug-in are checked and are validated.
14. If the Data Entry Mode is Sequence – the flow outlined in E9 will occur.
15. If the Data Entry Mode is Choose – the flow outlined in E10 will occur.
16. If the Data Entry Mode is Choose_auto_next – the flow outlined in E11 will occur.

H. No Operation or Resource Values – Both Component List & Data Entry Open

1. User does not enter Operation value
2. User does not enter Resource value
3. User has 1 SFC displayed in the SFC Field
4. User submits the Assemble Action (this button is configured to open the Component List and the Assemble Component Data Entry in a defined panel).
5. The Component List will be displayed and ordered by the assembly sequence in the BOM for the selected SFC. It will display all components
6. The Assemble Component Data Entry is opened in default state in the appropriate mode.
7. The user selects a component from the list.
8. The assemble button will not be enabled because an operation has not been selected.
9. The Assemble Component Data Entry state does not change.
10. User then enters an Operation value
11. User then enters a Resource Value
12. User has same SFC selected and has tab out of the field.
13. The Component List should be refreshed to only display the components for the selected operation and activity rules for both plug-in activities will be checked.
14. If the Data Entry Mode is Sequence – the flow outlined in A5 will occur.
15. If the Data Entry Mode is Choose – the flow outlined in B2 will occur.
16. If the Data Entry Mode is Choose_auto_next – the flow outlined in C2 will occur.

I. No Operation or Resource Values –Only Data Entry Open
   1. User does not enter Operation value
   2. User does not enter Resource value
   3. User has 1 SFC displayed in the SFC Field
   4. User submits the Assemble Action (this button is configured to open the Assemble Component Data Entry in a defined panel).
   5. The Assemble Component Data Entry is opened in default state in the appropriate mode.
   6. User then enters an Operation value
   7. User then enters a Resource Value
   8. User has same SFC selected and has tab out of the field.
   9. If the Data Entry Mode is Sequence – the flow outlined in F5 will occur.
   10. If the Data Entry Mode is Choose – the flow outlined in F6 will occur.If the Data Entry Mode is Choose_auto_next – the flow outlined in F7 will occur.

6.2 Exception Flows

A. A SFC value does not appear in the SFC field on the Operation POD or SFC POD or an SFC has not been selected in the Work List on the Work Center POD
   1. If the Component List and/or the Assemble Component Data Entry is displayed or submitted to be displayed, the Component List and the Assemble Component Data Entry plug-in will open in the default state as described at the general behavior section of this document. No message will be displayed to the user.

B. User selects a component out of sequence in the Component List

If the user selects a component row in the Component List and then submits the Assemble action button in the plug-in and the Assemble Component Data Entry plug-in is in sequence mode, the Assemble Component Data Entry plug-in will open empty. A message will appear in the Component List, the correct component row will be automatically selected by the system and the Assemble Component DE will be populated with the correct component row.

6.3 Time Sensitive Composite Material Scenario

6.3.1 Purpose / Goal

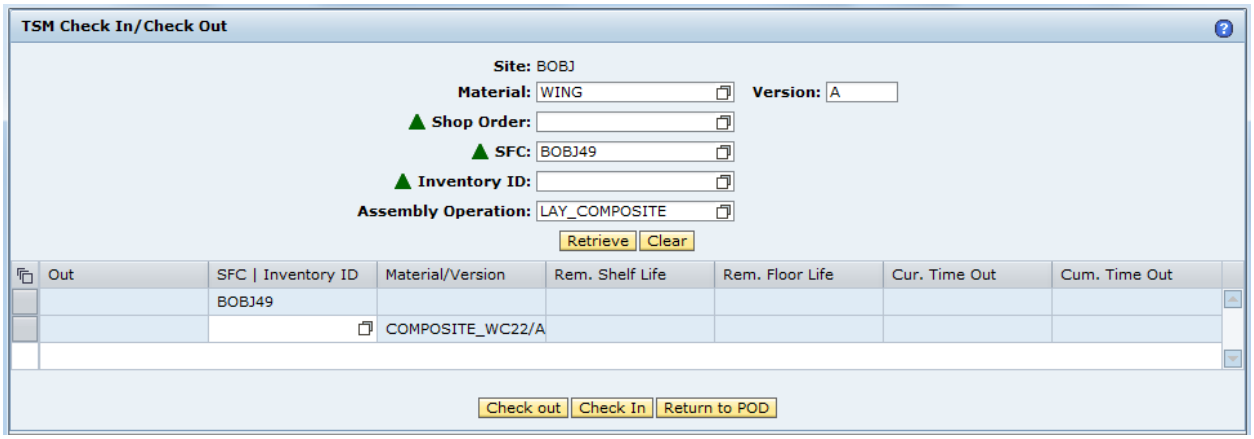
A time sensitive material, a roll of composite material for an aircraft wing, is partially consumed at an operation.

6.3.2 Scenario Specific Settings

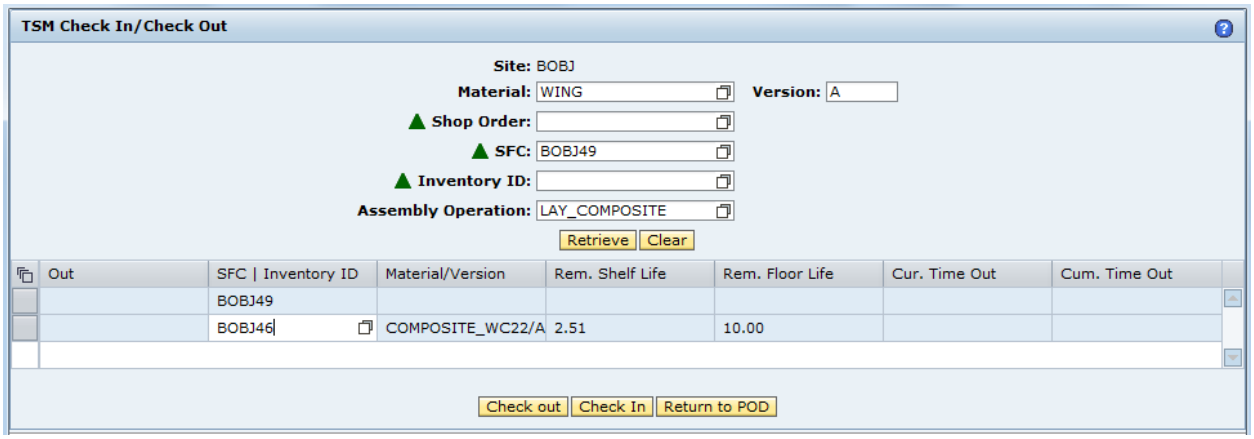
- The material, COMPOSITE_WC22, is designated as a time sensitive material with a shelf life of 5 days and a floor life of 10 hours. The unit of measure is FEET.
- A material WING is defined, with a BOM that contains COMPOSITE_WC22 as a component
- A routing is created with an operation LAY_COMPOSITE
- The routing is assigned to material WING
- An SFC is created and released for WING

6.3.3 Scenario Steps

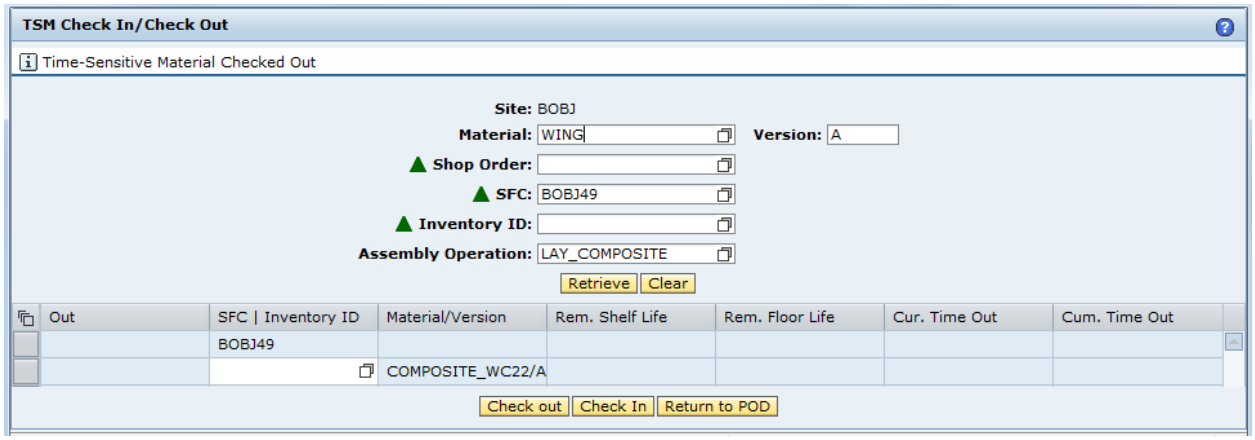
1. A roll of 200 feet of composite material WC-22 arrives from the vendor
2. The roll is processed and is received as a quantity of 200 with one inventory ID (COMP-000046)
3. The inventory ID is automatically checked in as it is received
4. The SFC (WING-000034) is started at the operation LAY_COMPOSITE in the POD
5. The **Assembly Point** activity is started
6. The operator selects the component COMPOSITE_WC22/A
7. The operator selects the inventory ID COMP-000046
8. The operator selects the Add button
9. The error message “One or more selected materials is not checked out” is displayed
10. The operator selects the Activities button, the TSM Check-In/Out activity and the OK button
11. The TSM Check-In/Out plug-in is displayed in a pop-up window
12. The operator selects the Retrieve button



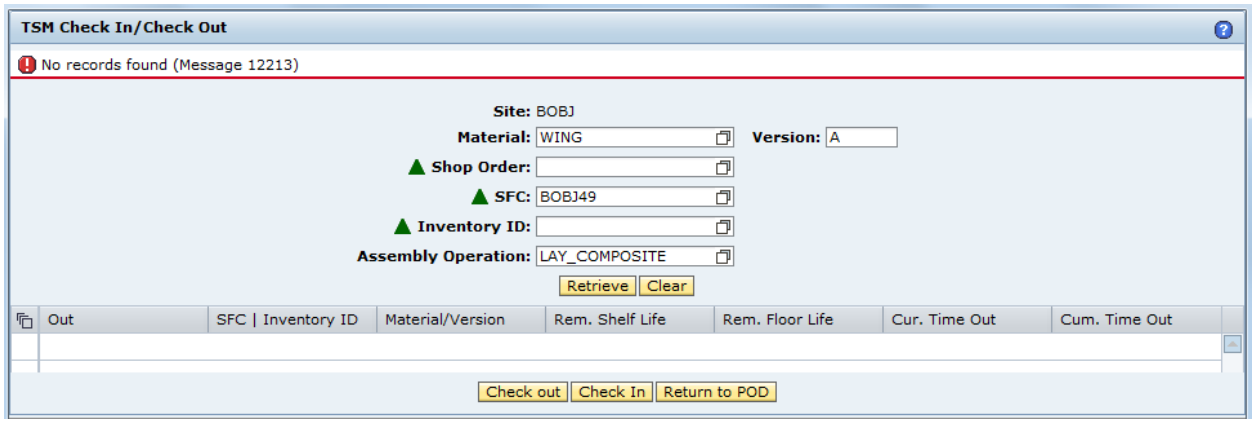
13. The operator selects the browse icon in the SFC | Inventory ID column and selects BOBJ46



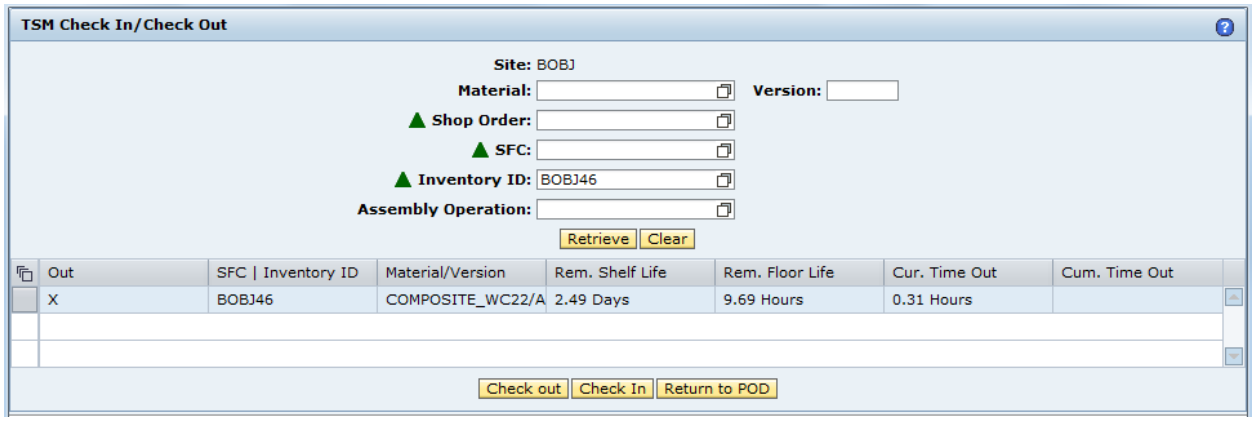
14. The operator selects the row containing BOBJ46 and selects the Check out button



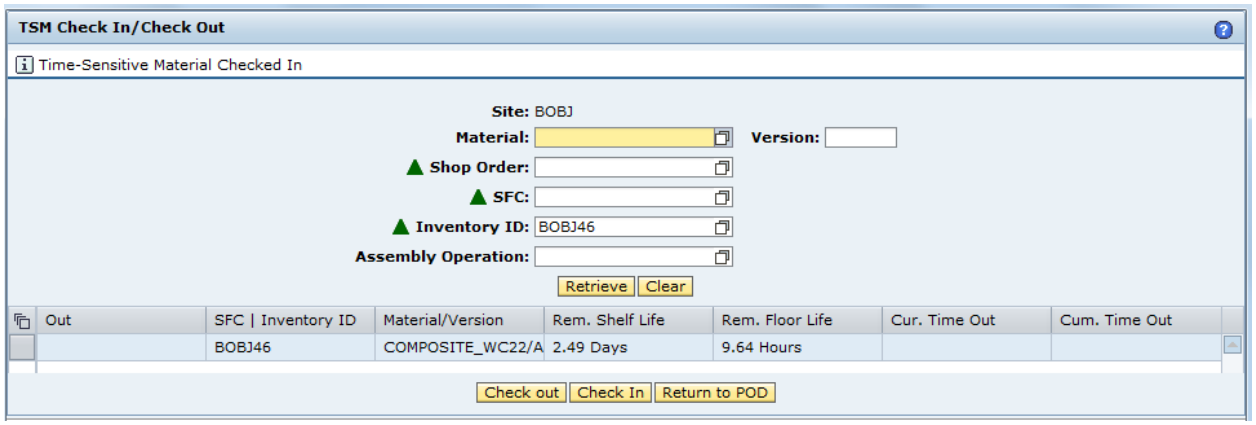
15. The operator selects the Return to POD button
16. The operator selects the Add button
17. A quantity of 125 feet of the composite is successfully assembled
18. The operator selects the Activities button, the TSM Check-In/Out activity and the OK button
19. The TSM Check-In/Out plug-in is displayed in a pop-up window
20. The operator selects the Retrieve button



21. The material WING no longer has a time sensitive component since the composite has now been assembled
22. The operator clears the screen, enters BOBJ46 in the Inventory ID field and selects the Retrieve button

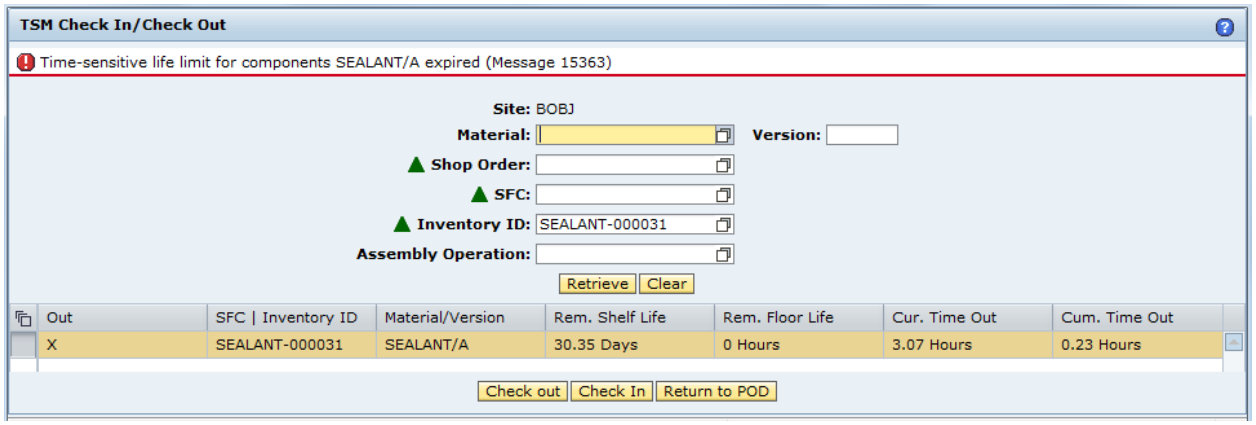


23. The operator selects the row containing BOBJ46 and selects the Check In button



24. The remainder of the roll of composite material has been checked back in
25. The operator selects the Return to POD button

Figure 4 Error message received when the TSM Material is Expired



7 Links to Additional Information

- List Maintenance – Link to User Maintenance information in SAP ME Help; http://help.sap.com/saphelp_me60/helpdata/EN/ed/eb96a455e54a56be8ea5bbf5741c8d/content.htm

- Assembly Data Type Maintenance: http://help.sap.com/saphelp_me60/helpdata/EN/e2/6b2dfd75494b96ac63f04c2edccb64/content.htm

- Data Field Definition Maintenance: http://help.sap.com/saphelp_me60/helpdata/EN/6e/41e3e445ba4467a8300cdfc0225a75/content.htm

- Assembly Point Configuration: http://help.sap.com/saphelp_me60/helpdata/EN/a7/c2634d2f784d309ec6295e4f072401/content.htm

- Material Maintenance: http://help.sap.com/saphelp_me60/helpdata/EN/b5/57503c6590466fa3fa97b56499dd8c/content.htm

- Assembly Point Components: http://help.sap.com/saphelp_me60/helpdata/EN/d7/f7f0be3fec4a31bec083a035eb2423/content.htm

8 Other Reference Material

Other How-To Guides on the Wiki here;
http://wiki.sdn.sap.com/wiki/display/ME/How+to+Guides

Or on the SDN here; https://community.wdf.sap.corp/sbs/community/sap-services-networks/services_manufacturing/me?view=overview

- SAP ME How-To-Guide for Setting up Pack and Unpack
- SAP ME How-To-Guide - Setting up Production Lines
- SAP ME How-To-Guide - Setting up Products
- SAP ME How-To-Guide - Setting up Activity Hooks
- SAP ME How-To-Guide - Setting up Activity Rules
- SAP ME How-To-Guide – Assembly

- SAP ME How-To-Guide – POD
- SAP ME How-To-Guide - Production Tracking
- SAP ME How-To-Guide – Time Sensitive Material
- SAP ME How-To-Guide – Data Collection
- SAP ME How-To-Guide – Bar Code Scanning

9 Overview of Changes

- Reworked the Assembly Point functionality to work on the LSF/JSF Framework. No Functional changes were made in SAP ME 6.0.