

## Chapter 2:

# Work In Process (WIP) Processing

## Objectives

After completing this section, you will be able to:

- ☐ Create, Release, Reject WIP Work Orders
- ☐ Process and Complete WIP Work Orders
- ☐ Move Batch(es) to Inventory



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## WIP Work Order Templates Using Processes and Operations Overview

The basic organizational structure of a WIP Work Order Template (Work Flow) utilizes the concept of Operations set up as a flow within a Process. The chart below provides an example of a template showing the relationship between Processes, Operations and Steps:

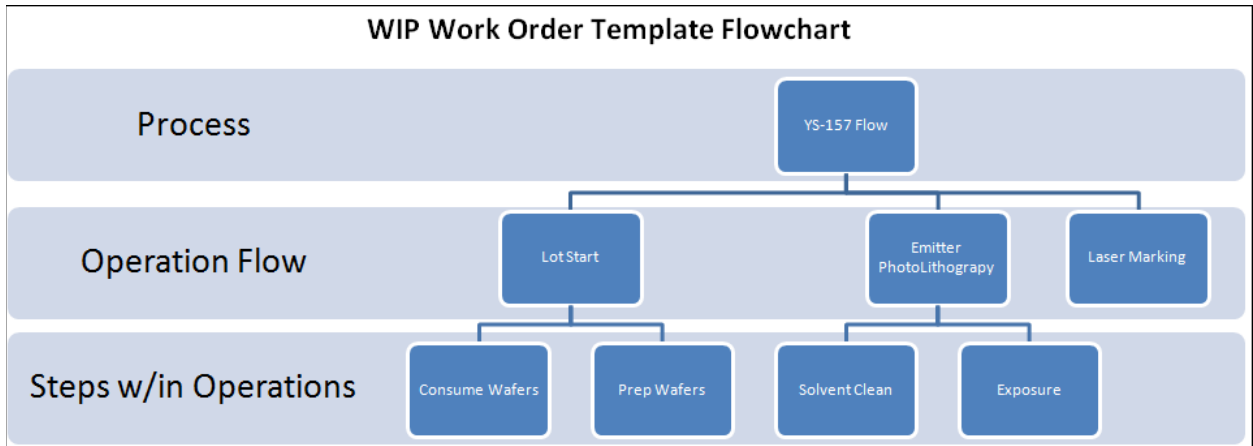


Figure 1 WIP Work Order Template Flowchart

In this example, the Process is titled "YS-157 Flow" and is set up in the Processes SubModule. It contains three Operations that are set up separately from the Process in the Operations SubModule. These Operations are standalone items that can be included in any number of Processes. Each Operation contains Steps that can be set up with its own logic and rules.

Figure 2 Process Detail Screen

In addition to setting up the Operation Flow and therefore the Steps, the Process also defines what Documents, Future Holds, and Notifications are available for the WIP Work Order. See the Operations and Processes sections of this chapter for more information.

Figure 3 Process Details on Revision Screen

Index	Operation Name	Operation Description	Revision	Is Required	AutoStart
0	WO Start Vapor	WO Start Vapor	01	True	False
1	Cure	Cure	01	False	False
2	Wire Bond and Pull	Wire Bond and Pull	01	True	False
3	Optical Leak Test (OLT)	Optical Leak Test (OLT)	01	True	False
4	Mark (Jet)	Mark (Jet)	01	True	False
5	Cure1 Updated	Cure1	01	True	False
6	Laser Mark	Laser Mark	01	True	False
7	Solder Ball & Reflow	Solder Ball & Reflow	01	True	False

Figure 4 Operation Flow



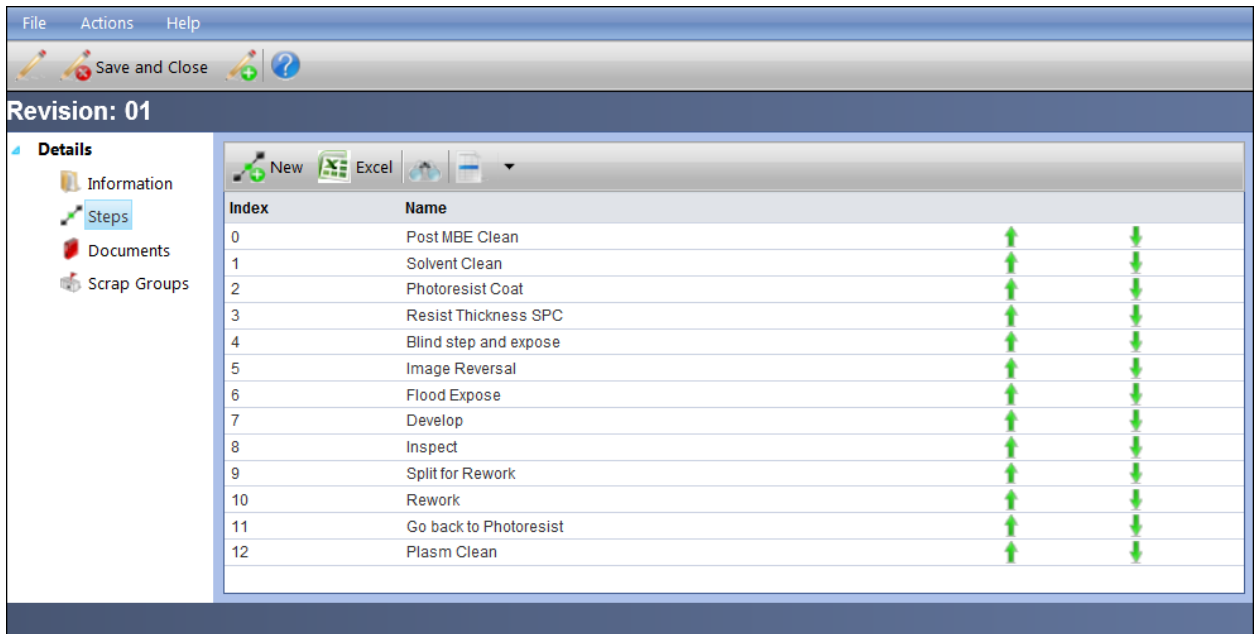


Figure 5 Steps within an Operation

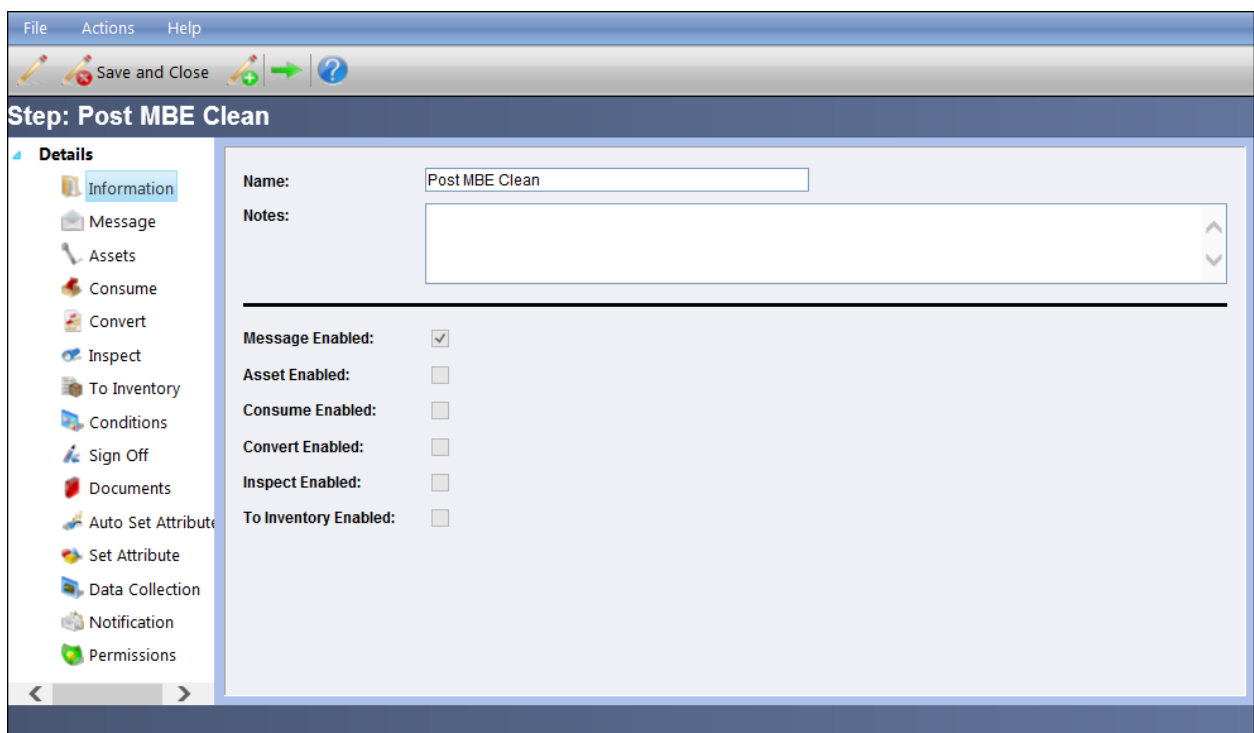


Figure 6 Step Detail Screen

As the Process is the template for the overall work order itself by providing Documents, Bill of Materials, Notifications, etc., the Steps can have those items set up as well. Each Step can have its own set of Documents, its own Work To Be Done, its own Inventory consumed, Attributes, Data Collection, etc.

## Creating WIP Work Orders

In order to create a WIP Work Order, the Product and WIP Process must already have been set up and associated to one another. Details are described in Chapter 11, WIP – Set Up.

The Work Orders Submodule is accessed via the WIP Module.



Figure 7 WIP Work Orders Viewer

Click on  New to open a blank WIP Work Order screen.

Figure 8 Blank New WIP Work Order Screen

Select the Product for which the work is to be done. The rest of the fields will populate with the values as set by the Default Process associated with the Product. If using a different Process, select a new one from the Process field. The rest of the fields will change accordingly.

**Figure 9 Populated New WIP Work Order Screen**

Make sure all of the information is correct. The values may be changed as needed on the spot or after saving. Those marked below with an \* are required.

- Qty of WO to Create: If configured for the Product, select the quantity of Work Orders to be generated from the drop-down list. If greater than one, then multiple Work Orders will be generated with identical header information (except the Work Order Number and ID, of course)
- \* Quantity: the quantity of Product to be built
- \* Prefix (variable Caption, might be labeled something else): if available, value that is to be included as part of the WIP Work Order Batch number and is selected upon creation of the Work Order. There can be additional Batch Part #s for selection. For questions regarding the meaning of the values, contact the TME Administrator as these are specific to the organization and not TME. This is true for all of the drop-down lists other than Status.
- \* Start Date/Due Date: the expected start date of work and the date it is due
- \* Priority: number system from one to one hundred. Each organization determines the direction of priority with high priority being at the low or high end of the range.
- Test Number: field used as determined by organization, the use of certain Recipes or Tools may be determined by what value is entered. Check with the TME Administrator for details.
- ECO: field represents Engineering Change Order, the use of certain Recipes or Tools may be determined by what value is entered. Check with the TME

Administrator for details.

- Category: used to organize Work Orders for search and reporting purposes
- SubCategory: same function as the Category field, values provided in the drop-down list are determined by the Category chosen.
- Type: another field for organizing Work Orders, not dependent on Category or SubCategory
- Assigned To: individual who is assigned to the Work Order, whether he/she is to complete the work or supervise
- \* Status: choices are “Created” and “Released.” The Work Order can be saved as Created and will not be available for processing until the Status is changed to Released. Once Created, the choice of “Rejected” is available. Once a Work Order has been released, it cannot be rejected and vice versa.
- Serial Numbers: link that appears under the Quantity field and allows manual entry of Serial Numbers; configuration to determine if serial numbers are entered manually or automatically generated is set at the Product within WIP Set Up

Once the Work Order has been created and **saved** (not yet released), the WO/Batch# automatically populates and the Product, Process, and Batch Part # fields are grayed out—those values cannot be changed (the Process can be later changed during processing and is detailed further in this chapter).

In the example below, the WO/Batch# was created using the four digit year, two digit work week, a dash, the selected value for Batch Part 1, and a 3 digit sequence.

**Figure 10 Newly Created Work Order, Not Fully Yet Released**



**If the product is serialized, those numbers will be assigned upon release of the Work Order. If the Product requires manual entry of Serial Numbers, a blue Serial Numbers link will appear under the Quantity field.**

Also, a tab may appear at the top titled “Attributes.” At this time, the values for the Attributes may be entered. These are the Work Order attributes and may have been set to trigger Conditions that alter the flow based on their values. It’s imperative to make sure they are set correctly.



The WIP Work Order may be configured to force a Save prior to Release/Reject options becoming available.

For more details on entering attributes, see the “Data Collection section of Chapter 1.

WorkOrder: 201611-T111

Details

- Information
- Documents
- Future Holds

General Attributes

Package Type: Please Select

BOM Required?: NO

Wafer Thickness:

Pin Count:

Cure Required?: Please Select

PO Number:

Figure 11 New Work Order Attributes Tab

If the screen is closed prior to releasing, the Status will be listed as “Created” in the Work Order viewer.

Work Orders User: Admin

WO Number	Main Product	Main Batch#	Total Qty	Category	SubCategory	Status	Start Date	Due Date	Priority	Operation	Operation Desc
S201351001			2.000000000			InProc	12/17/2013	12/24/2013	50	WO Start Vapor	WO Start Vapor
201402-T030	Product 2 -AC8	201402-T030	15.000000000			Created	1/9/2014	1/16/2014	63	WO Start Vapor	WO Start Vapor

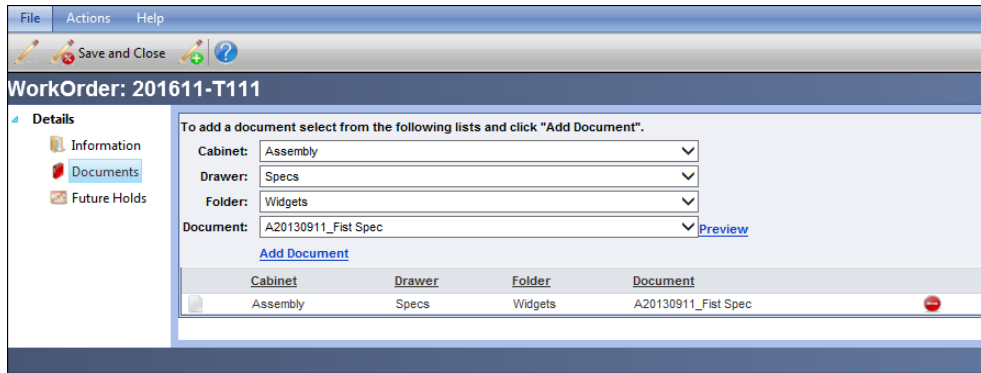
Figure 12 Work Order Viewer with Newly Created Work Order

## Additional Links on New WIP Work Order

### Documents



Files may be attached to a WIP Work Order via the Documents link. Attached files can be of any type (audio, video, autocad, Excel, Pdf, etc.) and will be accessible by Users on the Work Order at any time. The User must be logged into a computer that has the appropriate software for opening and viewing the files.

In order to attach, the file must have already been uploaded into the Documents module. See Chapter 3 Contacts and Documents for more details.



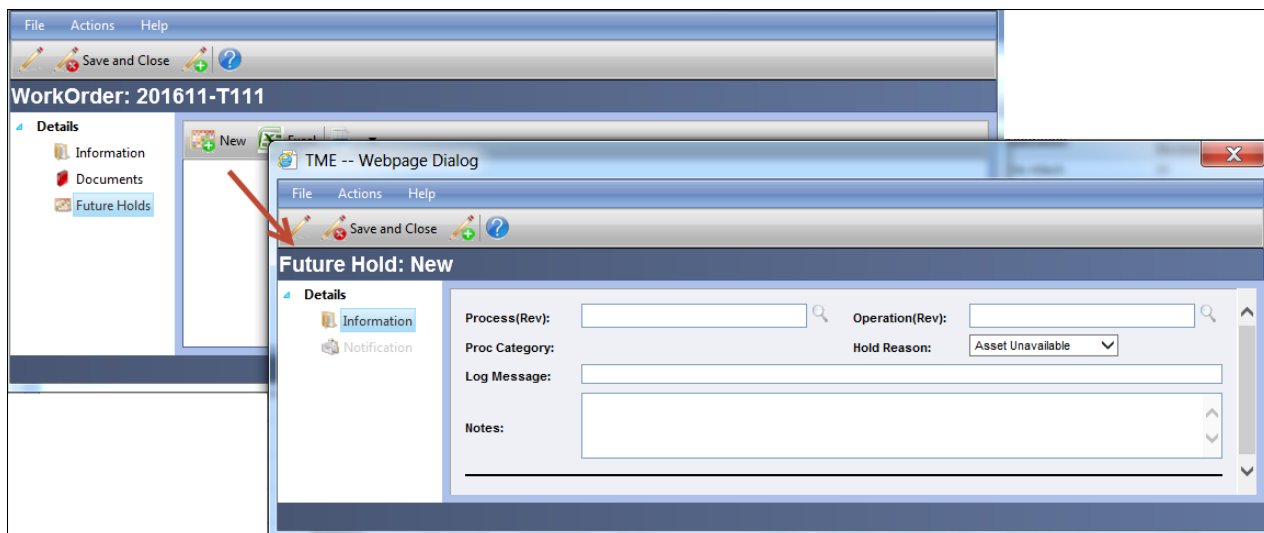
**Figure 13 Documents Link on New WIP Work Order**

To attach:

1. Select the Cabinet, Drawer, Folder and Document from the drop-down lists
2. Click [Preview](#) to open the document prior to attaching (make sure it's the document you want).
3. Click on [Add Document](#) to attach. Document information will appear in the viewer under the drop-down lists.
  - a. To view a document attached to an Asset, click on  in the appropriate row.
  - b. To delete an attachment, click on  in the appropriate row.

## Future Holds

The Future Holds feature allows Users to set up and schedule an automatic hold on a Work Order. In order to continue processing, the Work Order will have to be released by a User with the appropriate permission.



**Figure 14 Future Hold Screen**

Choose the Process(Rev) and the Operation at which the hold will take place. Choose the reason for the hold from the drop-down list. Type in the message that will be logged in the Work Order history. Notes provided will only be accessible from this screen (accessed from the Work Order by clicking on Future Holds and opening the record or if Work Order has already been released, by clicking on Edit Work Order and then Future Holds). More than one Future Hold may be set up.

Save the record to activate the Notification link.

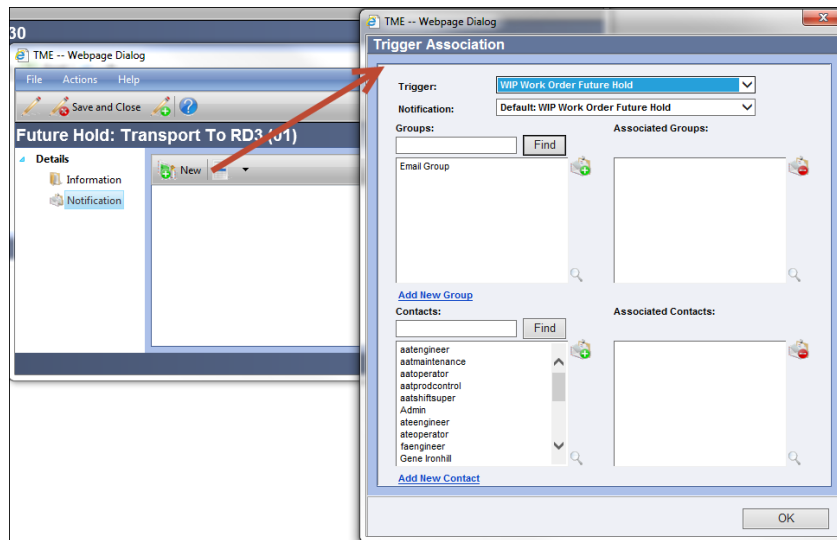


Figure 15 Future Hold Notification Link

Choose the Email Group and or Contact who should receive notification once the Hold takes place. See the Notifications portion of Chapter 4 Asset Management – Check In-Out for more details on how Notifications work.

## Releasing WIP Work Orders

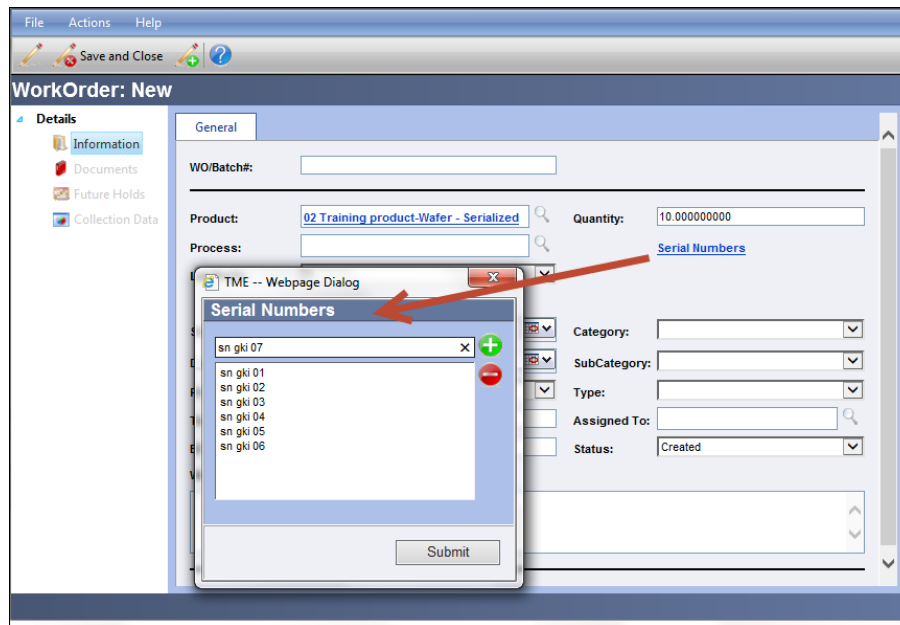
To release a WIP Work Order, change the Status from Created to Released. This can be done at the point of setting up a brand new Work Order (not having closed it in the Created state) if the configuration allows it or after it has been saved the first time (screen does not have to be closed) in the Created state.

The image shows a close-up of a form field labeled 'Status:'. A dropdown menu is open, showing three options: 'Created', 'Released', and 'Rejected'. The 'Released' option is highlighted with a blue background. Above the dropdown, there are fields for 'SubCategory:' and 'Type:', each with a dropdown arrow. To the right of the 'Assigned To:' field is a magnifying glass icon.

Figure 16 Release Status

If the Product is serialized, serial numbers will automatically be assigned per the associated rule (see TME Administrator for details). They will be visible onscreen after release.

If the rule is set for manual entry, the Serial Numbers link will be visible. Click on it to manually enter the Serial Numbers (by scanning a barcode or typing in the number and clicking Enter). The quantity of Serial Numbers entered must match the quantity listed on the Work Order.



**Figure 17 Manual Entry of Product Serial Numbers**

Once released and saved, the Work Order will be available for processing and will be listed in the viewer with the status “Avail”. This means that the Work Order is available for processing, but that the work has not yet been started.

Work Orders											User: Admin
WO Number	Main Product	Main Batch#	Total Qty	Category	SubCategory	Status	Start Date	Due Date	Priority	Operation	Operation Desc
S201351001			2.0000000000			InProc	12/17/2013	12/24/2013	50	WO Start Vapor	WO Start Vapor
201402-T030	Product 2 -AC8	201402-T030	15.0000000000			Avail	1/9/2014	1/16/2014	63	WO Start Vapor	WO Start Vapor

**Figure 18 Work Order in "Avail" Status**

Also, the Work Order will have a completely different look when opened. To go back to the original screen, click on [Edit Work Order](#).



**Work Order# 201611-T111**

<b>Quantity:</b> 15.00000000	<b>Status:</b> Avail
<b>Main Product:</b> Product 2 -AC8	<b>Hold Reason:</b>
<b>Cat/Subcat:</b> Lot Based/WF-2	<b>Assigned To:</b>
<b>Operation(Rev):</b> WO Start Vapor (01)	<b>Next Operation:</b> Die Attach (01)
<b>Operation Desc:</b> WO Start Vapor	<b>Priority:</b> 63
<b>Step:</b> 010 - Collect WO Start Attributes (Attr)	<b>Actual Start Date:</b> Not Started
<b>Process(Rev):</b> GKI Die Flow (03)	<b>Due Date:</b> 3/17/2016
<b>Child Lot?:</b> No	<b>Days in Operation:</b> Not Started
<b>Parent WO ID:</b>	<b>Type:</b>

**Actions:**

[Edit WorkOrder](#)  
[Print WorkOrder](#)  
[Open Operation](#)  
[Adjust](#)  
[Change Main Batch](#)  
[Change Process](#)  
[Change Product](#)  
[Combine](#)  
[Convert](#)  
[Hold](#)  
[Log Comment](#)  
[Release](#)  
[Reposition](#)  
[Scrap](#)  
[Split](#)  
[Put Inventory](#)  
[Return Inventory](#)  
[Take Inventory](#)  
[Close](#)

Work To Be Done | Serial #s | Operations/Steps | History | Documents | WO Attributes | Prod Attributes

This is the GKI Die Flow for the Packages using DIE Attach.

Help OK

Figure 19 WIP Work Order Ready for Processing

## Rejecting WIP Work Orders

To reject a new WIP Work Order, it must first have been saved with the status set to "Created." Change the Status to "Rejected." Once saved, the Work Order will appear in the viewer with the status "Rejected."

**Category:**

**SubCategory:**

**Type:**

**Assigned To:** Created  
Released  
**Rejected**

**Status:**

Figure 20 Rejected Status



Once released, a Work Order cannot be rejected.

**Work Orders** User: Admin

WO Number	Main Product	Main Batch#	Total Qty	Category	SubCategory	Status	Start Date	Due Date	Priority	Operation	Operation Desc
S201351001			2.000000000			InProc	12/17/2013	12/24/2013	50	WO Start Vapor	WO Start Vapor
201402-T031	Product 2 -AC8	201402-T031	15.000000000			Rejected	1/9/2014	1/16/2014	63		
201402-T030	Product 2 -AC8	201402-T030	15.000000000			Avail	1/9/2014	1/16/2014	63	WO Start Vapor	WO Start Vapor

Figure 21 Work Order in "Rejected" Status

The Work Order screen can be opened, however the Open Operation link will not be available. No processing can take place.

## Work Order Viewer

The Work Order Viewer is accessed via **WIP \ Work Orders**.



WO Number	Main Product	Main Batch#	Total Qty	Category	SubCategory	Status	Start Date	Due Date	Priority	Operation	Operation Desc
S201351001			2.000000000			InProc	12/17/2013	12/24/2013	50	WO Start Vapor	WO Start Vapor
201402-T031	MASSO A 20EBA	T201402001	1200.000000000			Closed	1/9/2014	1/16/2014	63		
201402-T030-5001						Closed	1/9/2014	1/16/2014	63		
201402-T030	Product 2 -ACB	201402-T030	12.000000000			InProc	1/9/2014	1/16/2014	63	WO Start Vapor	WO Start Vapor

**Figure 22 WIP Work Order Viewer**

The viewer shows all WIP Work Orders for which the logged in User has permission to access. They can be filtered and sorted as with any other viewer within TME. There are ten statuses for the Work Orders:

1. Created: the Work Order has been Created, but not yet Released for processing
2. Released: the Work Order has been Released for processing
3. Rejected: the Work Order has been Rejected instead of Released
4. Avail: Released the Work Order is available for processing but has not yet been started; also the status when the Work Order is in between Operations (queued)
5. InProc: processing has been initiated
6. Suspend: placed on suspension (hold) within a particular Step in the Work Order
7. Hold: placed on Hold from at the Work Order level, not at a Step
8. Park: placed in Park from at the Work Order level, not at a Step, deemed more long term than "Hold"
9. EndProc: processing has concluded (the last Step has been completed), but the Work Order hasn't yet been Closed
10. Closed: the Work Order has been officially closed (can be done at any time, not only after processing has been completed)

The Main Product is the Product for which the Work Order was initially set. Additional or alternate Products may be added through the conversion of the Main Product into alternate Products as well as through the combining of Work Orders. The same holds true for the Main Batch#--it is the initial Batch Number for the Work Order.

### Processing WIP Work Orders

Once a WIP Work Order has been released, it is available for processing by the appropriate Users. Different Operations and Steps may have permissions set that restrict who may process the work at that time.

#### Highlighting

Actions on the Work Order and Step details screens will be highlighted if they are the next natural progression for the Operator to take.

For Work Orders, it will be the Open Operation link until the End of Process has been reached, in which case the Closed link will be highlighted.

For Steps, it will be any Action that is required to take place in order to be able to Complete the Step.

### Work Order Tabs

The following tabs will/may be available upon release:

- Work To Be Done: basic description of the overall work, product, project, etc.

The screenshot shows a software window titled 'Work Order#: 201514-T065'. It contains two main sections. The top section is a form with fields for 'Quantity' (15.000000000), 'Main Product' (Product 2 -AC8), 'Cat/Subcat' (Testing/Product), 'Operation(Rev)' (WO Start Vapor (01)), 'Operation Desc' (WO Start Vapor), 'Step' (010 - Collect WO Start Attributes (Attr)), 'Process(Rev)' (GKI Die Flow (03)), 'Child Lot?' (No), 'Parent WO ID', 'Status' (Avail), 'Hold Reason', 'AssignedTo' (Gene Ironhill-User), 'Next Operation' (Die Attach (01)), 'Priority' (63), 'Actual Start Date' (Not Started), 'Due Date' (4/6/2015), 'Days in Operation' (Not Started), and 'Type' (Production). The bottom section is a tabbed interface with tabs for 'Work To Be Done', 'Serial #'s, 'Operations/Steps', 'History', 'WO Attributes', and 'Prod Attributes'. The 'Work To Be Done' tab is active, showing a text area with the message 'This is the GKI Die Flow for the Packages using DIE Attach.' To the left of the text area is a list of actions: 'Edit Work Order', 'Print Work Order', 'Open Operation' (highlighted in yellow), 'Log Comment', 'Hold', 'Split', 'Combine', 'Scrap', 'Convert', 'Change Main Batch', 'Reposition', 'Change Process', 'Take Inventory', and 'Put Inventory'. At the bottom of the window are 'Help' and 'OK' buttons.

Figure 23 Work To Be Done Tab

- Qty Detail: lists the Products, Batch Numbers, and quantities of product included in the WIP Work Order. There could be multiples due to Splits, Combines and Conversions. This tab is only available if there is more than one Product and/or Batch Number.

- Serial #s: if the Product is serialized, the Serial Numbers will be listed on this tab; the viewer also shows Product and Batch as there can be multiple of each as a result of Splits, Combines and Converts.

**Work Order#: 201514-T065**

Quantity: 15.000000000	Status: Avail
Main Product: Product 2 -AC8	Hold Reason:
Cat/Subcat: Testing/Product	Assigned To: Gene Ironhill-User
Operation(Rev): WO Start Vapor (01)	Next Operation: Die Attach (01)
Operation Desc: WO Start Vapor	Priority: 63
Step: 010 - Collect WO Start Attributes (Attr)	Actual Start Date: Not Started
Process(Rev): GKI Die Flow (03)	Due Date: 4/6/2015
Child Lot?: No	Days in Operation: Not Started
Parent WO ID:	Type: Production

**Actions:**

- Edit Work Order
- Print Work Order
- Open Operation
- Log Comment
- Hold
- Split
- Combine
- Scrap
- Convert
- Change Main Batch
- Reposition
- Change Process
- Take Inventory
- Put Inventory

Product	Batch	Serial Number
Product 2 -AC8	201514-T065	201514-T065-001
Product 2 -AC8	201514-T065	201514-T065-002
Product 2 -AC8	201514-T065	201514-T065-003
Product 2 -AC8	201514-T065	201514-T065-004
Product 2 -AC8	201514-T065	201514-T065-005
Product 2 -AC8	201514-T065	201514-T065-006
Product 2 -AC8	201514-T065	201514-T065-007
Product 2 -AC8	201514-T065	201514-T065-008
Product 2 -AC8	201514-T065	201514-T065-009
Product 2 -AC8	201514-T065	201514-T065-010
Product 2 -AC8	201514-T065	201514-T065-011
Product 2 -AC8	201514-T065	201514-T065-012
Product 2 -AC8	201514-T065	201514-T065-013

**Figure 24 Serial #s Tab**

- Operations/Steps: lists the Operations and Steps of the current Process. Indicators will show which Steps have been completed and what is the current Step. The viewer also shows the Qty of the Product going in and going out of the Step as well as the Operator who completed the Step.

Work To Be Done	Qty Detail	Serial #s	Operations/Steps	History	Documents	Inventory	Attributes
Die Attach (01)	Confirm Paste Thk-Process WO	12.000000000	12.000000000	Admin			
Die Attach (01)	Split Any Remaining DIE	12.000000000	12.000000000	Admin			
Die Attach (01)	Check for Child w/PROD DIE	12.000000000	12.000000000	Admin			
Die Attach (01)	Return to Process or Move Out	12.000000000	12.000000000	Admin			
Die Attach (01)	Attached Specifications	12.000000000	12.000000000	Admin			
Cure (01)	010 - CE Cure Start (Message Only)	12.000000000	12.000000000	Admin			
Cure (01)	020 - Start Oven (AssetStatus&Asset)	12.000000000	12.000000000	Admin			
Cure (01)	030 - Process Lot-Stop Oven (Asset&DC)	12.000000000	12.000000000	Admin			
Wire Bond and Pull (01)	010 - Bond Pull Start (Message Only)	12.000000000	12.000000000	Admin			
Wire Bond and Pull (01)	020 - Check & Start Wire Bond (AssetStatus&Asset)	12.000000000	12.000000000	Admin			
Wire Bond and Pull (01)	030 - Check&Start Plasma Clean (AssetStatus&Asset)	12.000000000	12.000000000	Admin			
Wire Bond and Pull (01)	040 - Verify Wire Bond Setup (Signoff)	12.000000000	12.000000000	Admin			
Wire Bond and Pull (01)	050 - Collect Wire ID (DC)	12.000000000					
Wire Bond and Pull (01)	060 - Perform Wire Pull (AStat&Asset&DC)						

**Figure 25 Operations/Steps Tab**

- History: Shows the entire history of the Work Order from Release through the Steps to Close; **everything** done at the Work Order or Step level will be recorded with a Date/Time stamp, name of the User, Action, the Operation and Step at which the action took place and the full Message of what was done. Records can be filtered using the standard viewer Search feature as well as sorted in ascending/descending order by clicking the column titles.

- Notes and Flags are added to a record by double-clicking on the record and entering notes and selecting the Flagged checkbox. Flagged items can be removed from screen by filtering via the Search feature:  
Flagged = False. For most Users, the use of the Flag is to indicate that a record should be ignored—that transactions have been done to counteract that of the Flagged record. However, it is up to the organization to determine the meaning of a Flagged record.

Work Order#: 201514-T065

Quantity: 15.000000000  
Main Product: Product 2 -AC8  
Cat/Subcat: Testing/Product  
Operation(Rev): WO Start Vapor (01)  
Operation Desc: WO Start Vapor  
Step: 010 - Collect WO Start Attributes (Attr)  
Process(Rev): GKI Die Flow (03)  
Child Lot?: No  
Parent WO ID:

Status: InProc  
Hold Reason:  
AssignedTo: Gene Ironhill-User  
Next Operation: Die Attach (01)  
Priority: 63  
Actual Start Date: 3/30/2015 1:28:27 PM  
Due Date: 4/6/2015  
Days in Operation: 0.00  
Type: Production

Actions:

- Edit Work Order
- Print Work Order
- Open Operation
- Log Comment
- Hold
- Split
- Combine
- Scrap
- Convert
- Change Main Batch
- Reposition
- Change Process
- Take Inventory
- Put Inventory

Views

Date Time	User	Action	Operation (Rev)	Step	Message	Notes	Flagged
3/30/2015 01:32:42 PM	Admin	CollectData	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Work Order attribute(s) set for variable group Die Area Group (Attr). [Die Area in Sq. in = 0.469]		False
3/30/2015 01:32:27 PM	Admin	CollectData	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Work Order attribute(s) set for variable group Die Area Group (Attr). [Die Area in Sq. in = 0.369]	Incorrect value entered. Re-entered as .469. This record is flagged for exclusion.	True
3/30/2015 01:28:27 PM	Admin	Start	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Step was started.		False
3/30/2015 01:25:48 PM	Admin	Release	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Qty 15.000000000 of Batch 201514-T065 was released via new Work Order.		False

Help OK

Figure 26 History Tab

Work Order#: 201514-T065

Quantity: 15.000000000  
Main Product: Product 2 -AC8  
Cat/Subcat: Testing/Product  
Operation(Rev): WO Start Vapor (01)  
Operation Desc: WO Start Vapor  
Step: 010 - Collect WO Start Attributes (Attr)  
Process(Rev): GKI Die Flow (03)  
Child Lot?: No  
Parent WO ID:

Status: InProc  
Hold Reason:  
AssignedTo: Gene Ironhill-User  
Next Operation: Die Attach (01)  
Priority: 63  
Actual Start Date: 3/30/2015 1:28:27 PM  
Due Date: 4/6/2015  
Days in Operation: 0.00  
Type: Production

Actions:

- Edit Work Order
- Print Work Order
- Open Operation
- Log Comment
- Hold
- Split
- Combine
- Scrap
- Convert
- Change Main Batch
- Reposition
- Change Process
- Take Inventory
- Put Inventory

Views

Date Time	User	Action	Operation (Rev)	Step	Message	Notes	Flagged
3/30/2015 01:32:42 PM	Admin	CollectData	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Work Order attribute(s) set for variable group Die Area Group (Attr). [Die Area in Sq. in = 0.469]		0
3/30/2015 01:32:27 PM	Admin	CollectData	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Work Order attribute(s) set for variable group Die Area Group (Attr). [Die Area in Sq. in = 0.369]	Incorrect value entered. Re-entered as .469. This record is flagged for exclusion.	True
3/30/2015 01:28:27 PM	Admin	Start	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Step was started.		False
3/30/2015 01:25:48 PM	Admin	Release	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Qty 15.000000000 of Batch 201514-T065 was released via new Work Order.		False

Help OK

TME -- Webpage Dialog

Event: CollectData

Details

Date Time: 3/30/2015 1:32:27 PM  
User: Admin  
Action: CollectData  
Operation: WO Start Vapor(01)  
Step: 010 - Collect WO Start Attributes (Attr)  
Message: Work Order attribute(s) set for variable group Die Area Group (Attr). [Die Area in Sq. in = 0.369]  
Notes: Incorrect value entered. Re-entered as .469. This record is flagged for exclusion.  
Flagged: ☒

Figure 27 Notes and Flags Added to History Record

- Data Collections can be opened and viewed (and edited if User has permission) by double-clicking on the Data Collect record and then clicking on the CollectData link. The Data Collection screen will open and once edits have been made, closed by clicking the Submit button. The Modified On and Modified By fields will adjust accordingly. Notes can be entered and saved on the Event detail screen to describe why the adjustment was made.

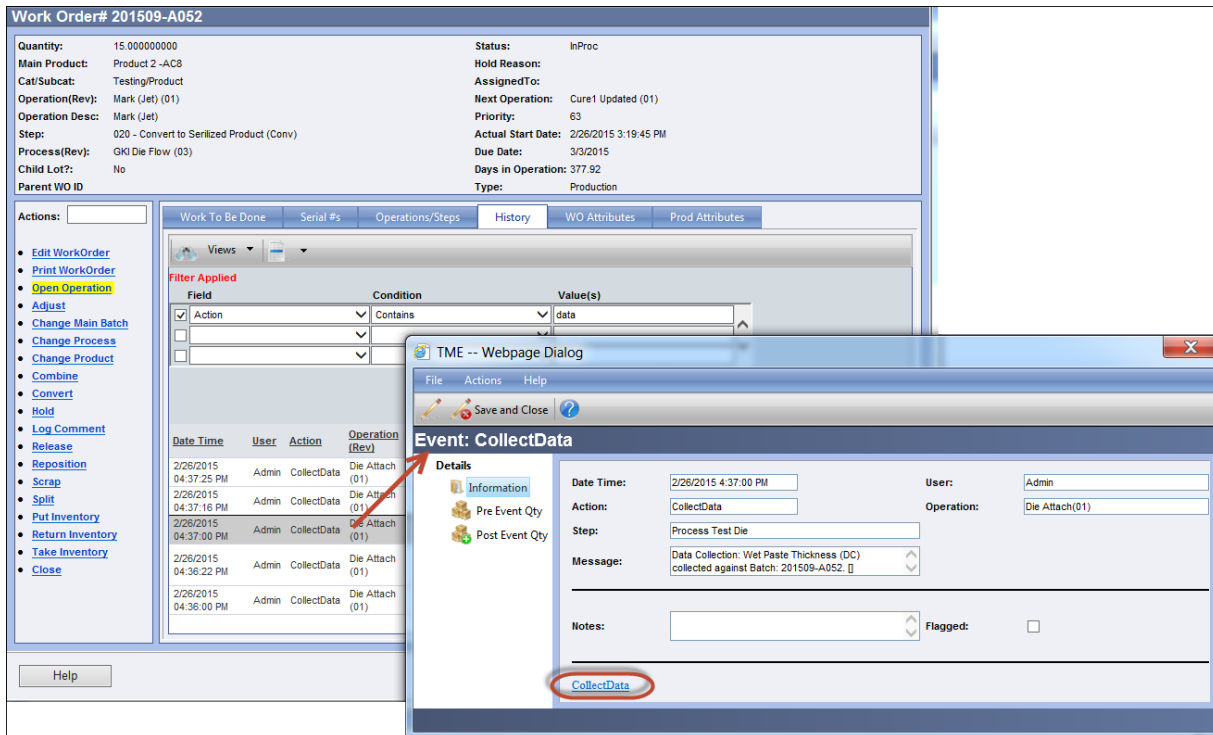


Figure 28 History Tab: Accessing Data Collection

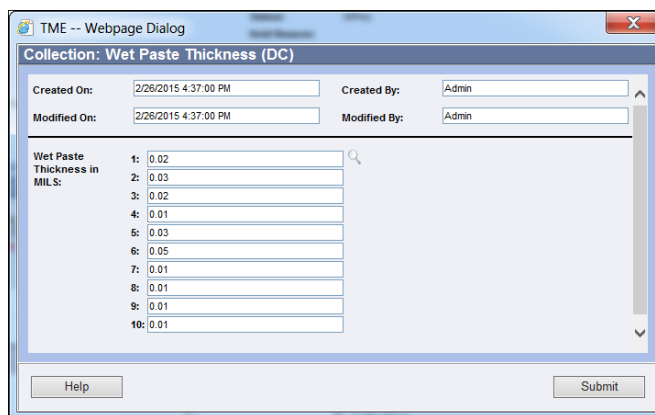

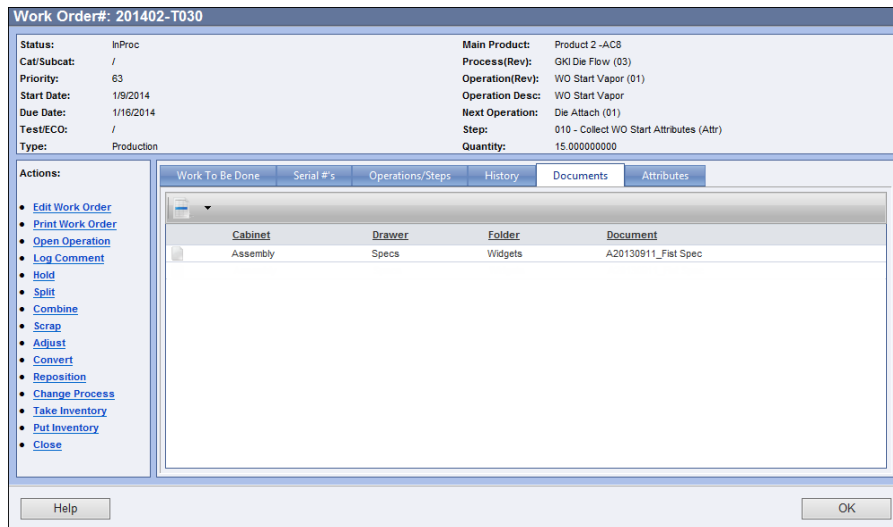


Figure 29 History Tab: Example of Data Collection Screen

- Documents: Attached files are accessible, click on the  to open the Document. The User must be logged in on a computer with the software that can open and run/view the file (audio, video, autocad, Excel, Pdf, etc.)



Work Order#: 201402-T030

Status:	InProc	Main Product:	Product 2 -AC8
Cat/Subcat:	/	Process(Rev):	GKI Die Flow (03)
Priority:	63	Operation(Rev):	WO Start Vapor (01)
Start Date:	1/9/2014	Operation Desc:	WO Start Vapor
Due Date:	1/16/2014	Next Operation:	Die Attach (01)
Test/ECO:	/	Step:	010 - Collect WO Start Attributes (Attr)
Type:	Production	Quantity:	15.000000000

Actions:

- Edit Work Order
- Print Work Order
- Open Operation
- Log Comment
- Hold
- Split
- Combine
- Scrap
- Adjust
- Convert
- Reposition
- Change Process
- Take Inventory
- Put Inventory
- Close

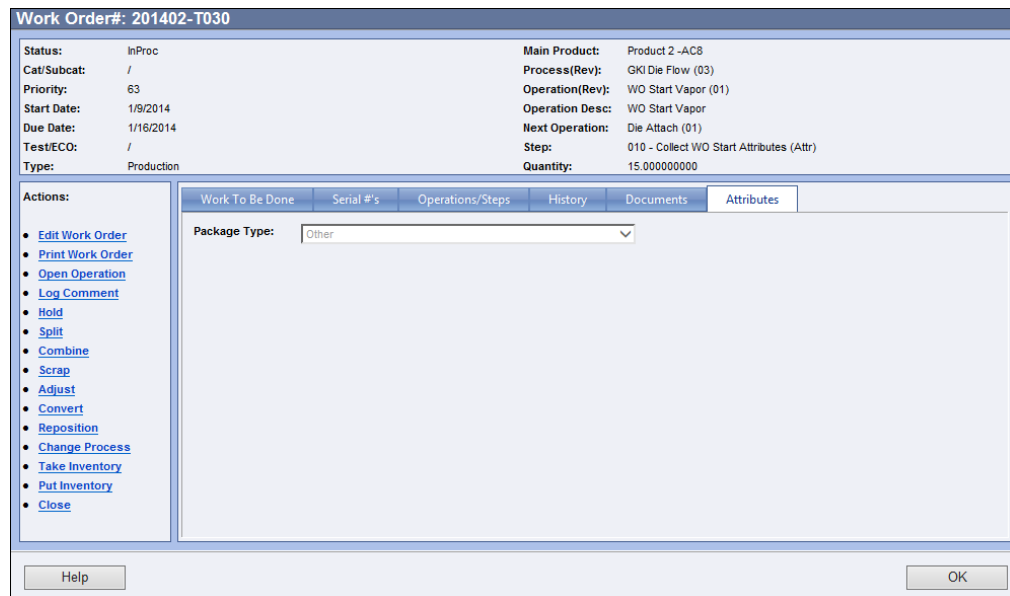
Work To Be Done | Serial #'s | Operations/Steps | History | Documents | Attributes

Cabinet	Drawer	Folder	Document
Assembly	Specs	Widgets	A20130911_Flat Spec

Help OK

Figure 30 Documents Tab

- Attributes: The Work Order Attributes are displayed on this tab, but cannot be entered or edited from this screen. The Attributes are set within the Work Order manually (accessed via Edit Work Order or by clicking on a Set Attribute action link at a Step) or automatically as it is processed through the Operations and Steps.



Work Order#: 201402-T030

Status:	InProc	Main Product:	Product 2 -AC8
Cat/Subcat:	/	Process(Rev):	GKI Die Flow (03)
Priority:	63	Operation(Rev):	WO Start Vapor (01)
Start Date:	1/9/2014	Operation Desc:	WO Start Vapor
Due Date:	1/16/2014	Next Operation:	Die Attach (01)
Test/ECO:	/	Step:	010 - Collect WO Start Attributes (Attr)
Type:	Production	Quantity:	15.000000000

Actions:

- Edit Work Order
- Print Work Order
- Open Operation
- Log Comment
- Hold
- Split
- Combine
- Scrap
- Adjust
- Convert
- Reposition
- Change Process
- Take Inventory
- Put Inventory
- Close

Work To Be Done | Serial #'s | Operations/Steps | History | Documents | Attributes

Package Type: Other

Help OK

Figure 31 Attributes Tab

- **Prod Attributes:** The Product and Batch Attributes are displayed on this tab, but cannot be entered or edited. The Product attributes are set on the Product's Inventory Item detail screen while the Batch Attributes are set on the Batch Number detail screen or during the course of processing the Work Order.

**Work Order#: 201514-T065**

Quantity: 18.00000000	Status: InProc
Main Product: Product 2 -AC8	Hold Reason:
Cat/Subcat: Testing/Product	AssignedTo: Gene Ironhill-User
Operation(Rev): WO Start Vapor (01)	Next Operation: Die Attach (01)
Operation Desc: WO Start Vapor	Priority: 63
Step: 010 - Collect WO Start Attributes (Attr)	Actual Start Date: 3/30/2015 1:28:27 PM
Process(Rev): GKI Die Flow (03)	Due Date: 4/6/2015
Child Lot?: No	Days in Operation: 0.03
Parent WO ID:	Type: Production

**Actions:**

- [Edit Work Order](#)
- [Print Work Order](#)
- [Open Operation](#)
- [Log Comment](#)
- [Hold](#)
- [Split](#)
- [Combine](#)
- [Scrap](#)
- [Convert](#)
- [Change Main Batch](#)
- [Reposition](#)
- [Change Process](#)
- [Take Inventory](#)
- [Put Inventory](#)

**Prod Attributes Tab:**

Prod: Product 2 -AC8

Package Type: Other

Is This Rework Lot: Yes

Cure160 Oven Temp: 163

Castaic Number: 0.5

Hybrid Notation: abc

Prod: Product 2 -AC8 : Batch 201514-T065

Picture 1: No Document Selected Date:

Pic 2: No Document Selected Date:

Pic 3: No Document Selected Date:

Prod: Product 2 -AC8 : Batch 201502-P046-S002

Picture 1: No Document Selected Date:

Pic 2: No Document Selected Date:

Pic 3: No Document Selected Date:

Help OK

**Figure 32 Prod Attributes Tab**



### Work Order Actions

Work Order Actions are available on the main processing screen at all times and are not dependent on which Operation or Step a User is at. However, these Actions are permission based; Users will have different Actions available depending on the Access Group to which they belong. Contact the TME Administrator for details.



**If an Action is not visible onscreen, then the User does not have permission to perform that transaction.**

### Edit Work Order

Clicking on the Edit Work Order link brings up the Work Order detail screen to allow for editing the Start Date, Due Date, Priority, Test Number, ECO, Category, SubCategory, Type, Assigned To and Work To Be Done fields as well as the Attributes on the Attributes tab. The WO/Batch#, Product, Process, Batch Part# and Quantity fields cannot be changed.

Changing the Quantity is done via the Adjust link on the Work Order processing screen; changing the Process is done via the Change Process link; and changing the Product is done via the Change Product link (or via Convert if actually converting from one Product to another).

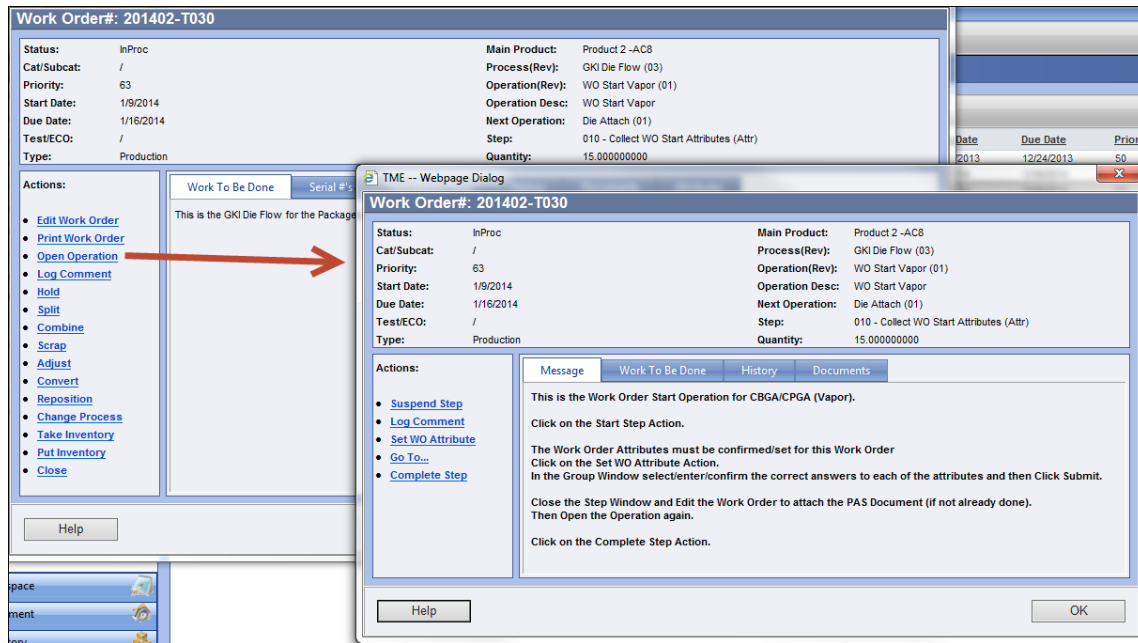
Documents, Future Holds and Collection Data links are available for viewing and revision. These links were covered earlier in this chapter as part of Creating New WIP Work Orders.

### Print Work Order

A printable version of the Work Order is available by clicking on the Print Work Order Form. It is customizable by MASS Group and set up at the Process level; so different Work Orders can have different forms. The form will open in pdf, so the computer must have the ability to open pdf's.

### Open Operation

If the Work Order is at a Step when it is opened from the viewer, it will open two windows—the main processing window and the current step window (on top). If the Work Order screen is being opened for the first time or in between Operations, the User will need to click on the Open Operation link to get to the first/current step window.

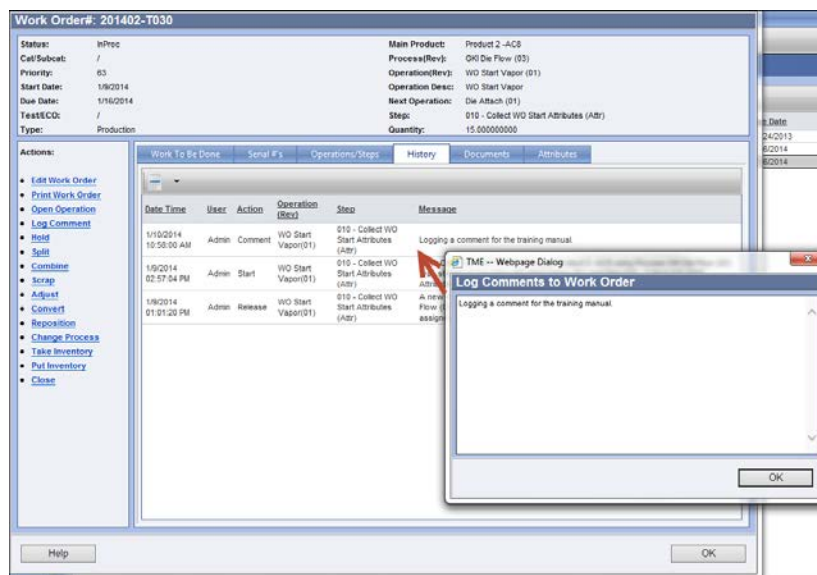


**Figure 33 Open Operation Link Opens the First/Current Step Window**

As the User completes a step, the next step window will appear unless the completed step was the last one in the Operation; at which point the User will be returned to the main processing screen. At any time, the User can click the OK button to close the Step screen and return to the main processing screen.

## Log Comment

This Action allows the User to log a comment to the history of the Work Order. It will only be accessible in the Work Order History, not the history of the Step.



**Figure 34 Logging a Comment to a Work Order**

### Hold

Work Orders can be placed on temporary Hold (or Park) at any time. Hold implies short term whereas Park implies long term.

The User selects a Reason (managed by the TME Administrator) for the Hold from the drop-down list and can add additional comments as necessary. If the Hold should be designated as “Park,” then the User selects the Park checkbox.

The screenshot shows a window titled "Hold Work Order". It has a "Reason:" label followed by a dropdown menu. The dropdown menu is open, showing four options: "Asset Unavailable", "Priority Shift", "Process Check", and "Request for Inspection". To the right of the dropdown is a checkbox labeled "Park". Below these is a large text area for comments. At the bottom right is an "OK" button.

Figure 35 Hold Work Order Screen

The main processing screen will adjust to only show the Actions that are available while a Work Order is on hold. Once it is released by a User with the permission to do so, the rest of the Actions will become available. On the viewer, the Work Order status will be Hold or Park.

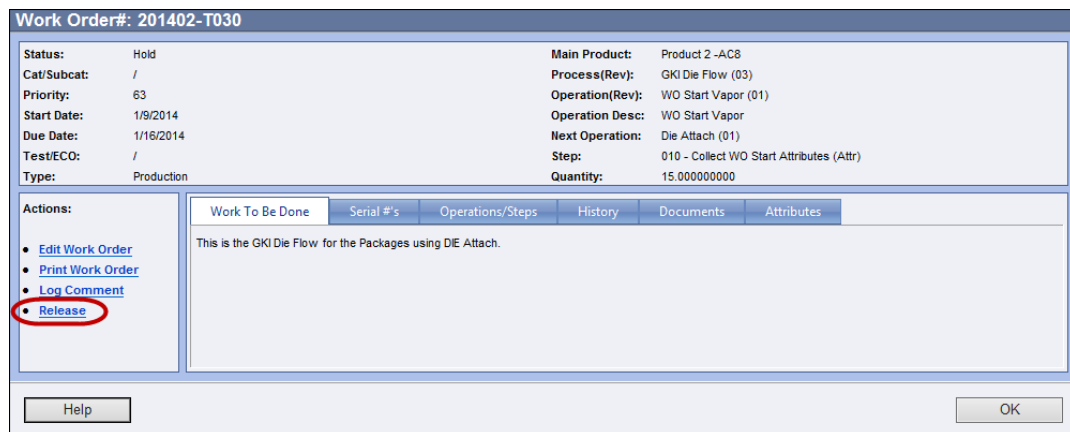
The screenshot shows a window titled "Work Order#: 201402-T030". It displays various fields for the work order, including Status (Hold), Cat/Subcat (/), Priority (63), Start Date (1/9/2014), Due Date (1/16/2014), Test/ECO (/), Type (Production), Main Product (Product 2 -AC8), Process(Rev) (GKI Die Flow (03)), Operation(Rev) (WO Start Vapor (01)), Operation Desc (WO Start Vapor), Next Operation (Die Attach (01)), Step (010 - Collect WO Start Attributes (Attr)), and Quantity (15.000000000). Below these fields is a section titled "Actions:" with a list of links: "Edit Work Order", "Print Work Order", "Log Comment", and "Release". The "Release" link is circled in red. To the right of the actions is a tabbed interface with tabs for "Work To Be Done", "Serial #'s", "Operations/Steps", "History", "Documents", and "Attributes". The "Work To Be Done" tab is selected, showing the text "This is the GKI Die Flow for the Packages using DIE Attach." At the bottom are "Help" and "OK" buttons.

Figure 36 Work Order On Hold

## Release

Work Orders need to be Released from Hold at some point in order to continue processing. Users with appropriate permission will be able to do this by clicking on the Release link.

The User selects a Reason (managed by the TME Administrator) from the Release Code the drop-down list and can add additional comments as necessary.

Figure 37 Release Work Order Hold Screen

## Split

Splits are used to take product out of the Work Order and into a new Work Order for alternate processing, testing, inspection, etc. The split items may be combined back into the Work Order at a later time or left on their own.

**Work Order# 201402-T030**

Status:	InProc	Main Product:	Product 2 -AC8
Cat/Subcat:	/	Process(Rev):	GKI Die Flow (03)
Priority:	63	Operation(Rev):	Die Attach (01)
Start Date:	1/9/2014	Operation Desc:	Die Attach
Due Date:	1/16/2014	Next Operation:	Cure (01)
Test/ECO:	/	Step:	Split Any Remaining DIE
Type:	Production	Quantity:	12.000000000

**Actions:**

- [Suspend Step](#)
- [Log Comment](#)
- [Go To...](#)
- [Complete Step](#)

**Message** | Work To Be Done | History | Documents

This step will enable the splitting off of any PRODUCTION DIE not processed.

If for some reason, there are remaining PRODUCTION die to be DIE attached, please split them off NOW by closing the Step Window (This Window) and Clicking on "Split" under "Actions" on the Operation Window.

Once the Split is complete, Click on Open Operation and then Click on the Complete Step Action.

IFF THERE ARE NO PRODUCTION DIE REMAINING, then Click on the Complete Step Action.

Help OK

Figure 38 Example of Step Message Directing User to Split the Work Order

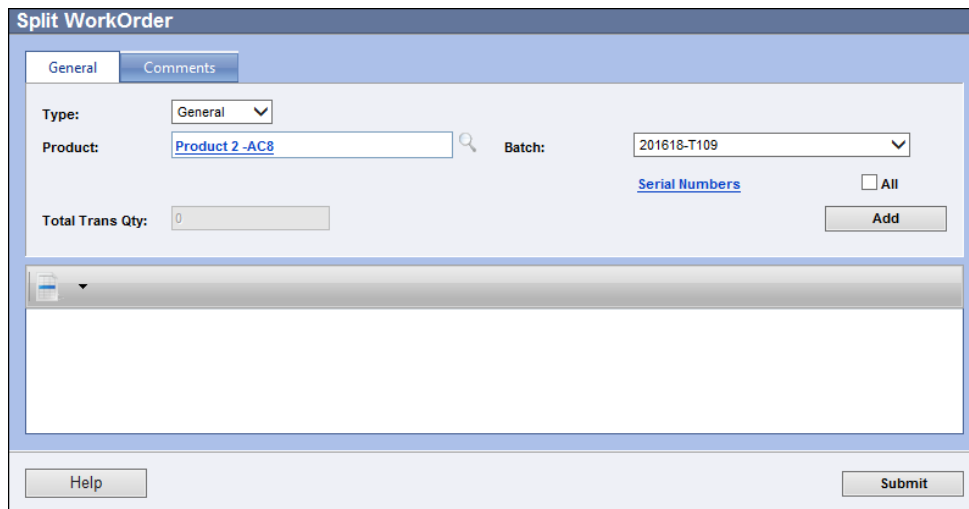


Figure 39 Split Work Order Screen

The main Product will populate the Product field, but can be changed if multiple Products are available. If there are Batch and/or Serial Numbers, those that are to be split will need to be selected.



**Put all items into a single transaction (if splitting off multiple combinations of Product/Batches/SerialNumbers) so that they are all split into the same new Work Order if they are to receive identical processing.**

The Batch Number drop-down list will contain only the batches of the selected Product in the Work Order.

If Product is not serialized, enter the Quantity for the selected Batch. Click on the Add button to on the Split Work Order screen to add the selected Items to the list at the bottom. Repeat for additional Items.

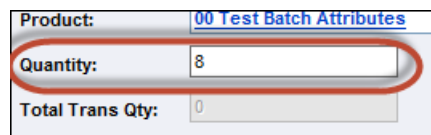




Figure 40 Split Work Order Screen - Quantity Field for Non-Serialized Product

The Serial Numbers screen will only show those for the combination of the selected Product and Batch Number.

The numbers can be filtered using the Filter drop-down criteria and the Apply link.

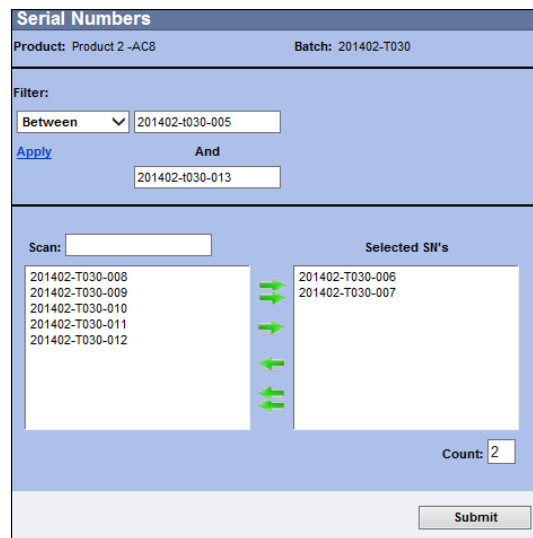
If the serial number barcode is available, click into the Scan field and scan the barcode (or type and hit the Enter key). This will select the serial number and place it into the Selected SN's column. Repeat as needed.

If not using barcoding, click on the Serial Number (use the Alt key and click on multiple numbers to select more than one; or the shift key to select all between two selected numbers) and then  to move it to the Selected SN's column.

To move all of the Serial Numbers, just click on .

The count field will show the quantity of numbers selected.

Click Submit when ready.



**Serial Numbers**

Product: Product 2 -AC8 Batch: 201402-T030

Filter:  
Between  And   
[Apply](#)

Scan:

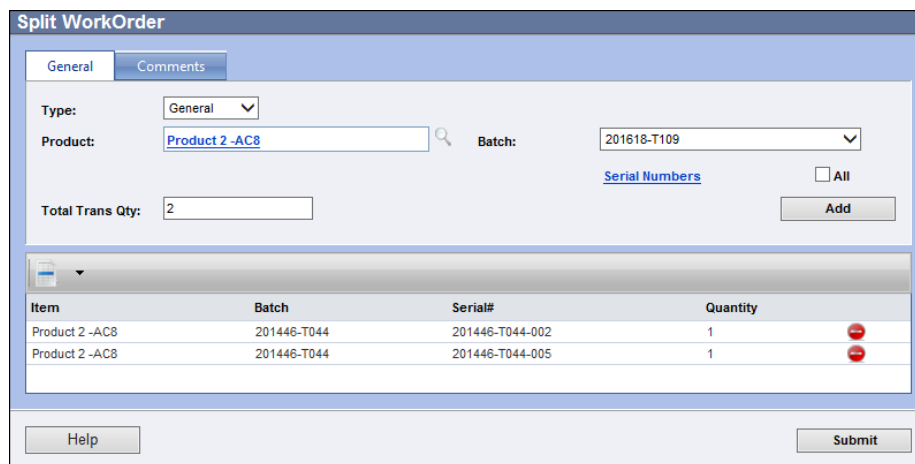
Available SN's	Selected SN's
201402-T030-008	201402-T030-006
201402-T030-009	201402-T030-007
201402-T030-010	
201402-T030-011	
201402-T030-012	

Count:

[Submit](#)

**Figure 41 Serial Numbers Selection Screen from Split Work Order**

Click on the Add button on the Split Work Order screen to add the selected Items to the list at the bottom. Repeat for additional Items.



**Split WorkOrder**

General Comments

Type:

Product:  Batch:

Total Trans Qty:

[Serial Numbers](#) ☐ All [Add](#)

Item	Batch	Serial#	Quantity
Product 2 -AC8	201446-T044	201446-T044-002	1
Product 2 -AC8	201446-T044	201446-T044-005	1

[Help](#) [Submit](#)

**Figure 42 Items Added to Split Work Order**

When all Items are on the list at the bottom. Click on the Submit button.

A new Work Order containing the split items will be created with a WO/Batch# automatically assigned. It will be the parent Work Order # with a dash followed by the split code associated to the Type of split selected from the drop-down list and then a three digit sequential number. It will be set at the same Operation and Step as the parent.

The history of the parent Work Order will be updated and the Qty adjusted accordingly.

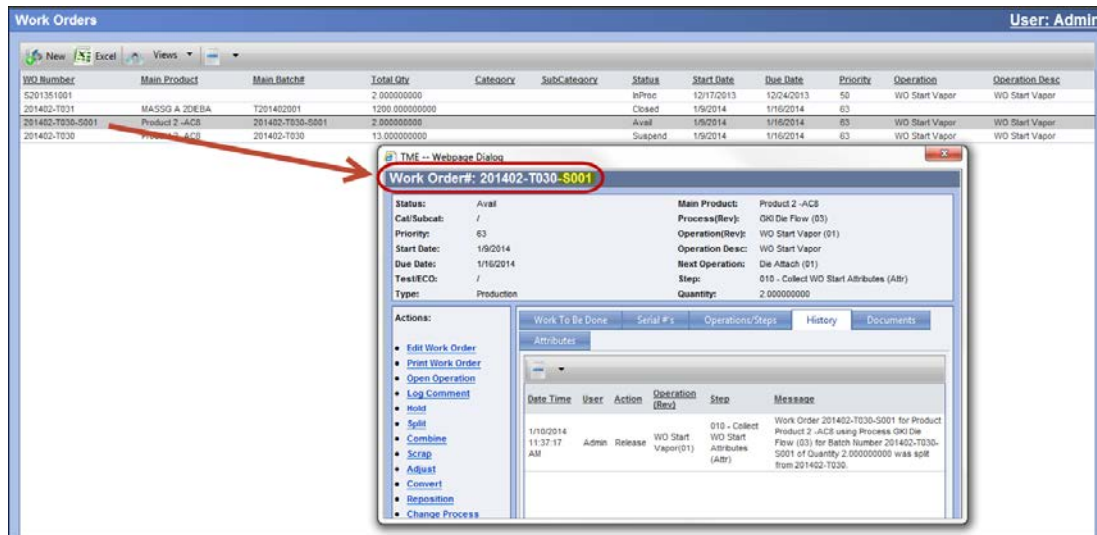


Figure 43 Newly Split Work Order

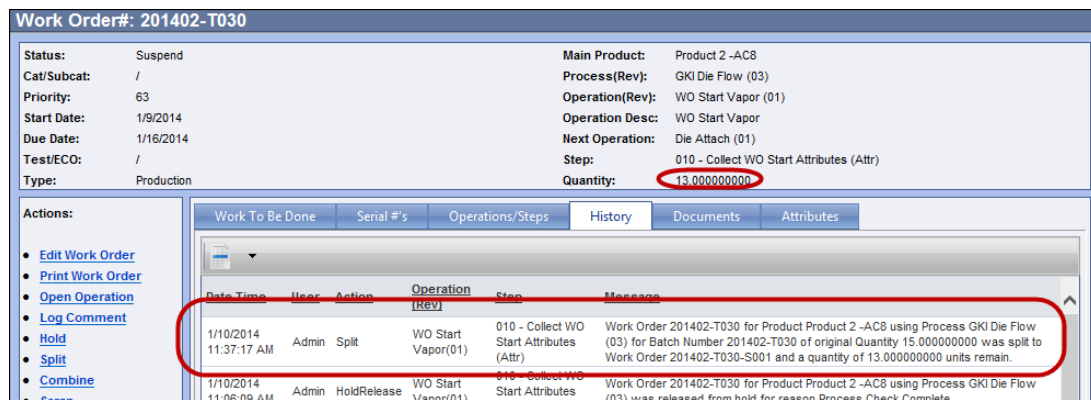
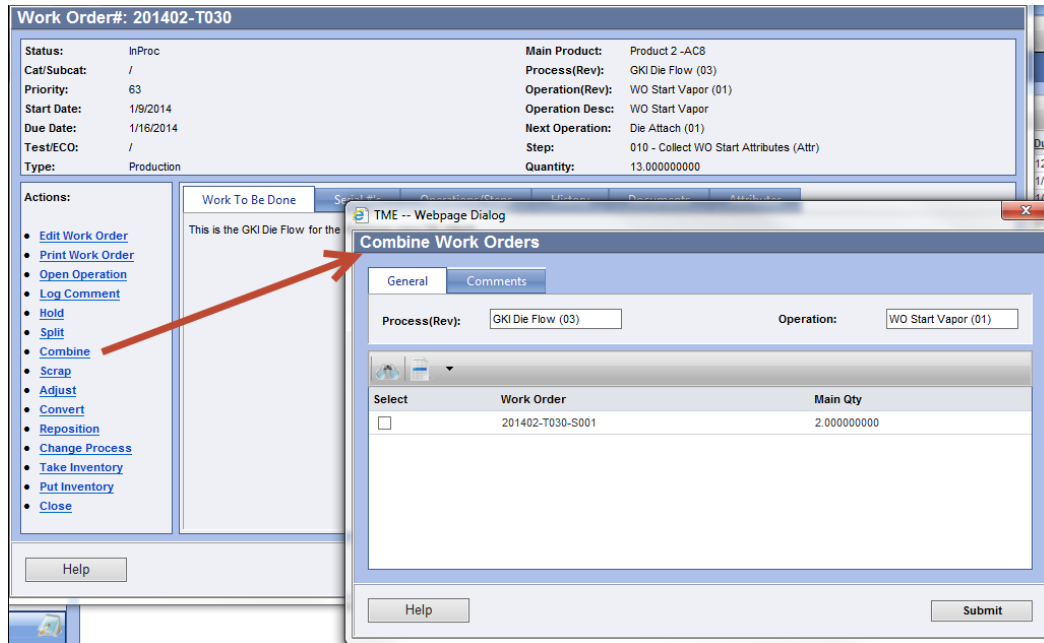


Figure 44 Parent Work Order - History of Split and Qty Adjust

### Combine

The Combine Action from within a Work Order takes one or more other Work Orders and brings them into the auspices of the Work Order where the Combine is taking place. All Work Orders must be in the exact same Process, Operation/Step and Type. In addition, if a Work Order is on hold, it can only be combined with other Work Orders on hold and vice versa (not on hold with not on hold). The history of the “children” Work

Orders will remain with those Work Orders; however, combined history is available via Reports. The Combine link will only be available when configured to be--options include permissible based on Access Group of User, only for Work Orders that are on hold or for only for those not on hold.



**Figure 45 Combine Action Screen**

Only those Work Orders that are in the same Process, Operation/Step and Type will be available for selection. Comments that will log into the Work Order History may be included by clicking on the Comments tab and entering accordingly. Click Submit when ready.

The “child” Work Order status will change to Closed and the products will be moved to the new Parent. A new “Qty Detail” tab will appear on the Work Order processing screen. This tab shows the summarized quantities of all Items along with their Batch Numbers and if applicable, Serial Numbers.



**Work Order#: 201402-T030**

<b>Status:</b> InProc	<b>Main Product:</b> Product 2 -AC8
<b>Cat/Subcat:</b> /	<b>Process(Rev):</b> GKI Die Flow (03)
<b>Priority:</b> 63	<b>Operation(Rev):</b> WO Start Vapor (01)
<b>Start Date:</b> 1/9/2014	<b>Operation Desc:</b> WO Start Vapor
<b>Due Date:</b> 1/16/2014	<b>Next Operation:</b> Die Attach (01)
<b>Test/ECO:</b> /	<b>Step:</b> 010 - Collect WO Start Attributes (Attr)
<b>Type:</b> Production	<b>Quantity:</b> 15.000000000

**Actions:**

- Edit Work Order
- Print Work Order
- Open Operation
- Log Comment
- Hold
- Split
- Combine
- Scrap
- Adjust
- Convert
- Reposition
- Change Process
- Take Inventory
- Put Inventory
- Close

Product	Batch	Quantity
Product 2 -AC8	201402-T030	13.000000000
Product 2 -AC8	201402-T030-S001	2.000000000

Help OK

Figure 46 Qty Detail Tab

### Change Main Batch

This transaction allows the Operator to change which Product/Batch is listed as the Main Product and Main Batch Number should more than one combination exist within the Work Order (after a Convert and/or Combine has occurred).

TME -- Webpage Dialog

**Work Order#: 201514-T065**

<b>Quantity:</b> 18.000000000	<b>Status:</b> InProc
<b>Main Product:</b> Product 2 -AC8	<b>Hold Reason:</b>
<b>Cat/Subcat:</b> Testing/Product	<b>AssignedTo:</b> Gene Ironhill-User
<b>Operation(Rev):</b> WO Start Vapor (01)	<b>Next Operation:</b> Die Attach (01)
<b>Operation Desc:</b> WO Start Vapor	<b>Priority:</b> 63
<b>Step:</b> 010 - Collect WO Start Attributes (Attr)	<b>Actual Start Date:</b> 3/30/2015 1:28:27 PM
<b>Process(Rev):</b> GKI Die Flow (03)	
<b>Child Lot?:</b> No	
<b>Parent WO ID:</b>	

**Actions:**

- Edit Work Order
- Print Work Order
- Open Operation
- Log Comment
- Hold
- Split
- Combine
- Scrap
- Convert
- Change Main Batch
- Reposition
- Change Process
- Take Inventory
- Put Inventory

**Change Main**

Product / Batch: Product 2 -AC8 / 201502-P046-S002

Product 2 -AC8 / 201514-T065

OK

Check for Child WIPROD DIE  
Return to Process or Move Out

Help OK

Figure 47 Change Main Batch Screen

## Scrap

There are actually two transactions that can take place using the Scrap Action. Scrap removes selected Items from the Work Order and places them into Inventory at a Scrap Locale (defined by the TME Administrator). Destroy removes selected Items from the Work Order and does not put them back into Inventory; they no longer exist or have a quantity within TME.

**Figure 48 Scrap from Work Orders Screen**

To Scrap, leave the Destroy checkbox unselected and choose the Scrap Locale where the Items will be sent from the drop-down list. If the Items are to be destroyed, select the Destroy checkbox and the Scrap Locale drop-down list will disappear.

The Main Product will already be selected, however, you can change it to any alternate Product that is available within the Work Order via the LookUp icon.

Select the Batch number from the drop down list and if the Serial Numbers link is present, click to select the Serial Numbers that are to be scrapped.

Select one or more Scrap Codes (managed by the TME Administrator) from the drop-down list. Each one will highlight as it is chosen. Click the Add button. Repeat for additional items.

**Scrap Items from Work Order**

General Comments

Destroy: ☐

Scrap Locale: SCM/SPL/PLC153/Scrap Shelf

Product: Product 2 -AC8

Batch: 201411-T037

Scrap Code: BKG Equipment - Electronics Failure  
BKG Equipment - Erosion OR Corrosion  
BKG Equipment - Induced Contamination  
BKG Equipment - Wafer Handling Failure (breakage)  
CBGA Component - Bad Site

Serial Numbers(2) ☐ All

Quantity: 2

Add

Item	Batch	Serial#	Quantity	Scrap Code
Product 2 -AC8	201514-T065	201514-T065-001	1	BKG Equipment - Electronics Failure
Product 2 -AC8	201514-T065	201514-T065-004	1	BKG Equipment - Electronics Failure
Product 2 -AC8	201514-T065	201514-T065-001	1	BKG Equipment - Induced Contamination
Product 2 -AC8	201514-T065	201514-T065-004	1	BKG Equipment - Induced Contamination

Help

This Scrap record will reflect two items scrapped with two Scrap Codes each. The Add button has been disabled. Operator can only remove items or Submit. If more items need to be Scrapped, then a separate transaction must be conducted.

Submit

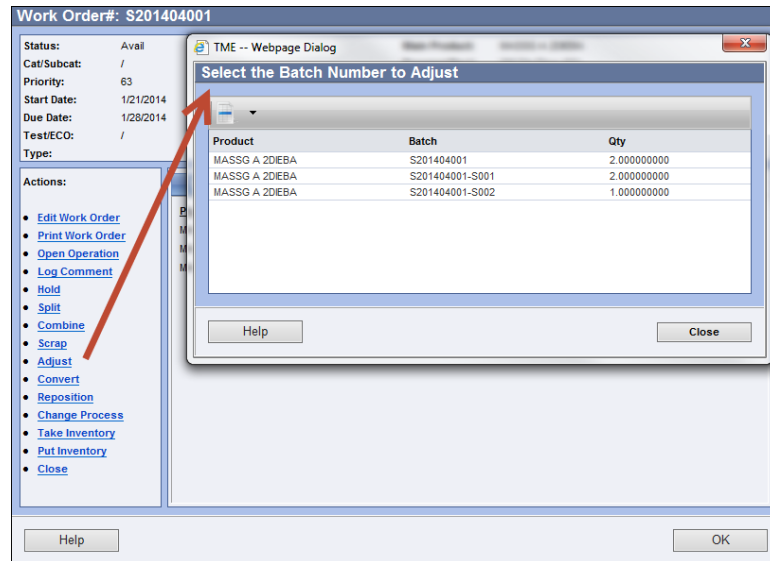
**Figure 49 Items Added to Scrap Items from Work Order Screen**

Click Submit when ready.

The Quantity of the Work Order and the summarized quantities on the Qty Detail screen will adjust accordingly and the history tab will update. Items scrapped and not destroyed will now show quantity in the Scrap locale with an adjustment ("-00X" added to the end, may include a character such as "S" prior to the first zero as configured by the TME Administrator) to the batch number to indicate it had been scrapped.

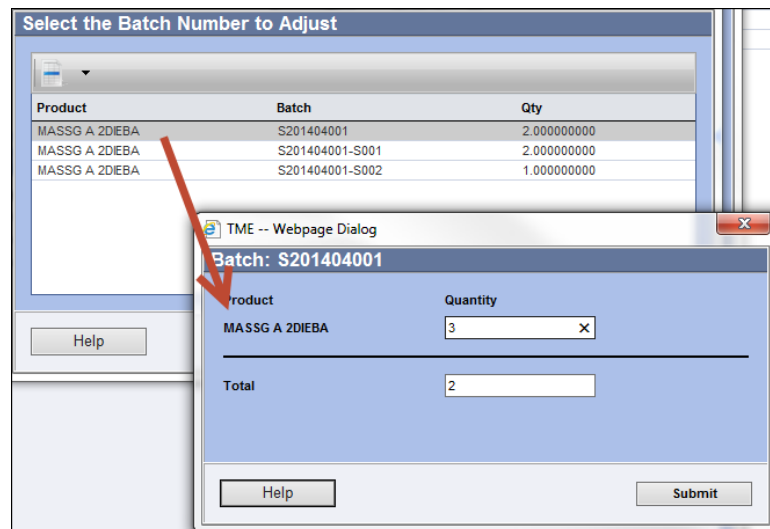
### Adjust

Adjust allows the User to change the Quantity of product contained within the Work Order. It is a simple transaction whereby the Quantity for the Batch Number(s) is simply changed. This feature may be restricted by the TME Administrator—it might require that the total Quantity of Product across Batch Numbers remains equal or it may not be available at all.



**Figure 50 Select the Batch Number to Adjust Screen**

Double click on the record to Adjust. Enter the new Quantity and click the Submit button when ready. Repeat for each record requiring adjustment and then click the Close button.



**Figure 51 Adjust Action Screen**

## Reposition

Reposition allows the User to set the Work Order at the beginning of an alternate Operation within the current Process. Once submitted, the User will be able to click on Open Operation and will be at the first Step of the selected Operation. The History tab will update and include the Date/Time stamp, Username, and the message of what occurred.

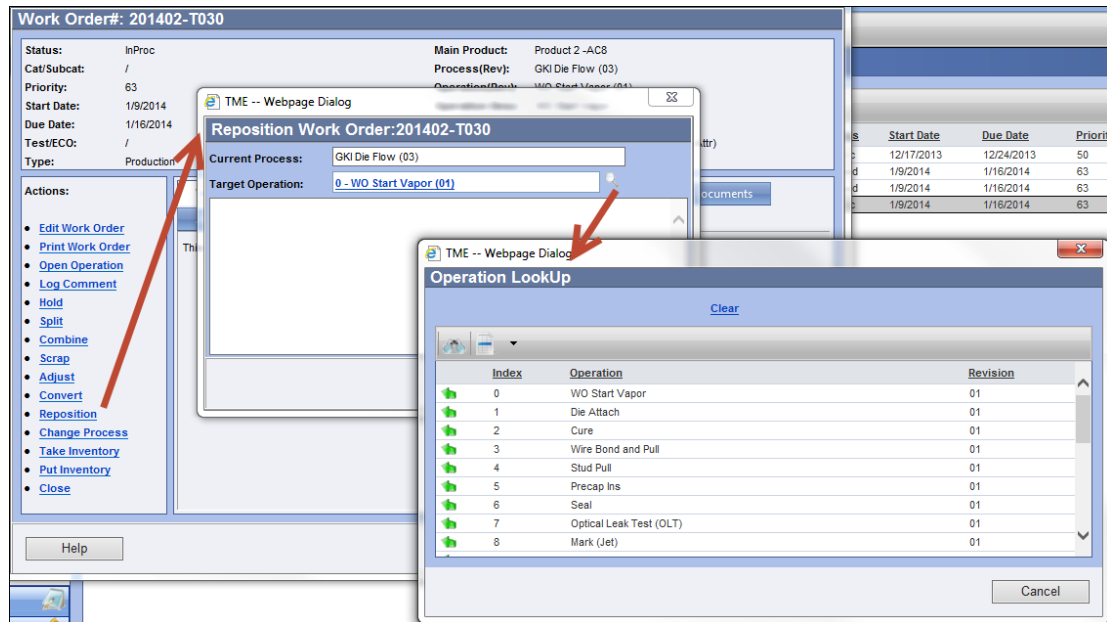


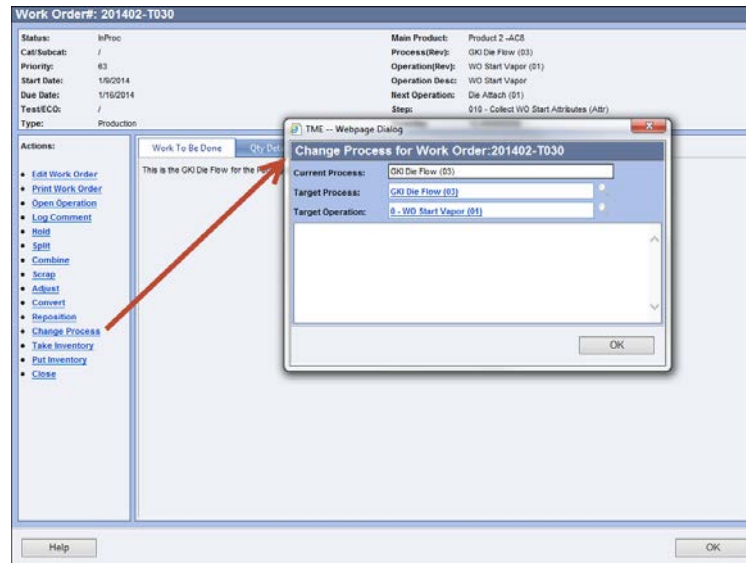
Figure 52 Reposition Work Order and Operation LookUp Screens

### Optional Reposition

The configuration may be set up so that the Operator can only have access to the Reposition link when starting the first Operation in a series of non-required Operations (Optional Operations). This will allow the Operator to jump from one to another out of order or even skip Operations that do not need to be done. The list of Operations to select will be all sequential non-required Operations within a group followed by the very next Required Operation. The Operator will not be able to fully Reposition anywhere in the Process, but only within the group of Optional Operations. The Reposition link will not be available while the Operator is processing a Required Operation (unless full Reposition permission has been provided).



### Change Process

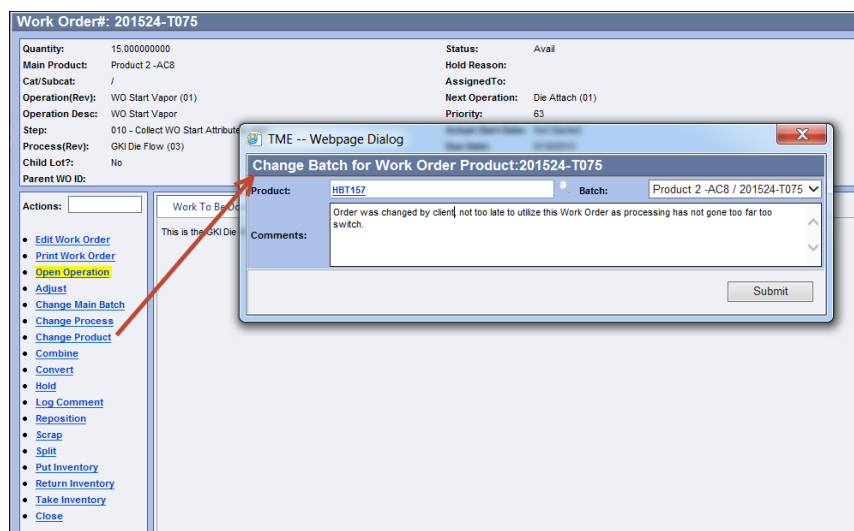
The Change Process Action is similar to Reposition. Instead of repositioning within a Process, this Action allows for the selection of an alternate Process (and an Operation) entirely.



**Figure 53 Change Process for Work Order Screen**

## Change Product

The Product of a Work Order can be changed by clicking on the Change Product link. The purpose is to allow for the starting of a Work Order with a base Product and switching mid-stream based on an order or priority change (for example, one type of wafer for another). Click on the Product LookUp icon  and the Item LookUp screen will appear. If the current Product is serialized, the LookUp screen will show only serialized product and vice versa. Select the new Product via the corresponding Select icon . Add Comments accordingly and click on the Submit button. The Main Product for the Work Order will change to the newly selected Product. Behind the scenes, all Batch Numbers and Serial Numbers (if applicable) will be copied over to the new Product's Inventory Item detail screen along with any set Attributes, barcode values, etc.



**Figure 54 Change Product Screen**

### Take and Put Inventory

When consuming inventory to the Work Order, the User needs to select a locale from which the inventory is being consumed. The Take Inventory Action allows the User to gather and take the inventory items in advance from the locale(s) and place them “into the Work Order.” Rather than a physical locale, the items are reserved for a particular Work Order. Of course, they still need to be physically placed somewhere so as not be to available for other work. That is determined by each organization. The User can then consume the items from the Work Order directly instead of locales.

Select the Item (or scan the item barcode), batch number (or scan the batch barcode, item will populate if the batch barcode is unique), and the Serial Numbers (or scan the barcodes). Select the Locale from which the items are being taken and enter the transaction quantity. Click the Add button to add to the list. Repeat for all Items needed.

If selecting lots of items in quantities of one, select the Auto checkbox prior to selecting an Item. This will automatically add the Item to the list without needing to click on the Add button (if Item is batched/serialized, will need to provide that information first). If using barcodes, User will have the ability to just scan barcodes without clicking on the screen to Add them to the list.

Click Submit when ready.

#	Item	Desc	Locale	Batch	Serial	Qty	Unit
1	Device 2 Batched	Device 2 Batched	Main/Bldg 1/Floor 1/Room 101	564-A		3	Each

Figure 55 Take from Locale Screen

A new tab “Inventory” appears which shows all items taken into the Work Order and are ready to be consumed during processing.

Work Order#: 201402-T030

Status: InProc Main Product: Product 2 -ACE  
 Cat/Subcat: / Process(Rev): QK Die Flow (03)  
 Priority: 63 Operation(Rev): WO Start Vapor (01)  
 Start Date: 1/9/2014 Operation Desc: WO Start Vapor  
 Due Date: 1/16/2014 Next Operation: Die Attach (01)  
 Test/CO: / Step: 010 - Collect WO Start Attributes (AB)  
 Type: Production Quantity: 12.000000000

Actions:

- Edit Work Order
- Print Work Order
- Open Operation
- Log Comment
- Hold
- Split
- Combine
- Scrap
- Adjust
- Convert
- Reposition
- Change Process
- Take Inventory
- Put Inventory
- Close

Work To Be Done Qty Detail Serial #'s Operations/Steps History Documents Inventory Attributes

Name	Description	Part Number	Batch	Serial Number	Quantity
Device 2 Batched	Device 2 Batched	Part 1	564-A	3.00000000	


Help OK

**Figure 56 Inventory Tab**

The Put Inventory does the opposite; pulls items from the Work Order back into Inventory at a Locale.

### ***Return Inventory***

If material is inadvertently consumed (wrong Batch Number, Serial Number, Quantity, etc.), it can be returned to the locale from which it was consumed with the Return Inventory link. Clicking this link on the Work Order screen will open the Return to Inventory screen. This screen lists the Inventory previously consumed via all Consume steps, whether to the Work Order, Batch Number or Serial Number.

Click on the  adjacent to the record needed to select. Repeat for all Items to return. Add Comments within the Comments tab accordingly. Click the Submit button when ready. The full quantity of the transaction will be returned, there is no partial selection. If that is necessary, return the full quantity, go back to the Step (may need to Reposition or perform a GoTo) and re-consume the correct quantity.

The Inventory transaction log and Quantity screens will update upon submittal to reflect the Return from WIP to a locale.



**Return to Inventory**

General Comments

Product	Prod Batch	Product Serial#	Material	Material Batch	Material Serial#	BOM Name	Operation	Step	Qty	UOM	Returned
Product 3 Serialized	S201526003		Device 4 Batched and Serialized	20140430144158	abc2	Serialized and Batch Items	Batch Consume(2 to Batch)	Consume to Batch	1.00000000	Each	False
Product 3 Serialized	S201526003		Device 2 Batched	Batch090814-01		Serialized and Batch Items	Batch Consume(2 to Batch)	Consume to Batch	15.00000000	Each	False
Product 3 Serialized	S201526003	One_0059	Device 3 Batched and Serialized	201502004	Test2015Jan06008-001	Serialized and Batch Items	Serial Consume(3 to SN)	Consume to SN	1.00000000	Each	False
Product 3 Serialized	S201526003	One_0059	Device 3 Batched and Serialized	20150121130204	sn012115gk02	Serialized and Batch Items	Serial Consume(3 to SN)	Consume to SN	1.00000000	Each	False
Product 3 Serialized	S201526003	One_0059	Device 3 Batched and Serialized	20150121130204	sn012115gk010	Serialized and Batch Items	Serial Consume(3 to SN)	Consume to SN	1.00000000	Each	False
Product 3 Serialized	S201526003	One_0061	Device 3 Batched and Serialized	20150121130204	sn012115gk08	Serialized and Batch Items	Serial Consume(3 to SN)	Consume to SN	1.00000000	Each	False

Product	Prod Batch	Product Serial#	Material	Material Batch	Material Serial#	BOM Name	Operation	Material Serial#	Qty	UOM
Product 3 Serialized	S201526003		Device 4 Batched and Serialized	20140430144158	abc1	Serialized and Batch Items	Batch Consume(2 to Batch)	Consume to Batch	1	Each

Help Submit

Figure 57 Return to Inventory Screen

### Close

To close the Work Order when processing is complete, click on the Close link. Choose the Reason (managed by the TME Administrator) for the closure from the drop-down list. Type in any additional comments and click OK to submit.

**Close Work Order: 201402-T030**

Close Reason:

- Complete
- Order Canceled
- Other
- Work Complete

OK

Figure 58 Close Work Order Screen

The Work Order status will be changed to Closed. Only the Edit Work Order and Print Work Order Actions will be available. The Work Order will be automatically Closed once all Product has been moved to Inventory within a Step. The Main Product and Main Batch # fields will be emptied as there is no longer Product in the Work Order. The closure will be logged in the History in the same manner as all other Actions.

## ***Re-Open***

The Work Order can be re-opened after it has been closed by clicking on the Re-Open Work Order link (available only if User has permission). Once clicked, if further processing is needed, the User will need to Reposition to an Operation prior to the Open Operation link becoming available.

## Processing Work Orders Step by Step

To begin processing a Work Order, open it from the Work Order Viewer and click on the Open Operation link to open the Step screen on top of the processing screen. If the Work Order has already been started at a Step, the Step screen will automatically appear upon opening the Work Order and the User will go from Step screen to Step screen until the end of an Operation.

**Work Order#: 201514-T065**

Quantity:	18.000000000	Status:	InProc
Main Product:	Product 2 -AC8	Hold Reason:	
Cat/Subcat:	Testing/Product	AssignedTo:	Gene Ironhill-User
Operation(Rev):	WO Start Vapor (01)	Next Operation:	Die Attach (01)
Operation Desc:	WO Start Vapor	Priority:	63
Step:	010 - Collect WO Start Attributes (Attr)	Actual Start Date:	3/30/2015 1:28:27 PM
Process(Rev):	GKI Die Flow (03)	Due Date:	4/6/2015
Child Lot?:	No	Days in Operation:	0.03
Parent WO ID:		Type:	Production

**Actions:**

- [Edit Work Order](#)
- [Print Work Order](#)
- [Open Operation](#)
- [Log Comment](#)

**Work To Be Done** | Qty Detail | Serial #'s | Operations/Steps | History

WO Attributes | Prod Attributes

This is the GKI Die Flow for the Packages using DIE Attach.

Figure 59 Opening the Step Screen

The Step screen is almost identical to the main processing screen. However, the links on the left are specific to the Actions that can be taken at the Step. Also, it will have an Action link with the word Step in it—i.e., Start Step, Suspend Step, Release Step and Complete Step at the top.

**Work Order#: 201514-T065**

Quantity:	18.000000000	Status:	Avail
Main Product:	Product 2 -AC8	Hold Reason:	
Cat/Subcat:	Testing/Product	AssignedTo:	Gene Ironhill-User
Operation(Rev):	Die Attach (01)	Next Operation:	Cure (01)
Operation Desc:	Die Attach	Priority:	63
Step:	CE DIE Attach Start	Actual Start Date:	3/30/2015 1:28:27 PM
Process(Rev):	GKI Die Flow (03)	Due Date:	4/6/2015
Child Lot?:	No	Days in Operation:	Not Started
Parent WO ID:		Type:	Production

**Actions:**

- [Start Step](#)
- [Log Comment](#)
- [Go To...](#)

**Message** | Work To Be Done | History | Documents

This is the CE DIE Attach Operation.

Click the Start Step Action.

Click the Complete Step Action.

In the next Step, you will collect the Package BOM data.

Figure 60 Example of a Step Screen

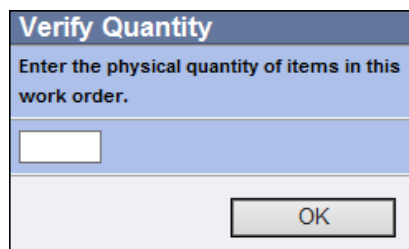
## Start/Complete Step

When opening the first Step in an Operation for the first time, the • [Start Step](#) link will need to be selected (configuration may eliminate this link and auto start the Operation). This will provide the start date/time within the Step's history and open up additional Action links. Subsequent Steps within the same Operation will be automatically started upon the completion of the previous Step.

To move onto the next Step, click on • [Complete Step](#) . If the current Step is the last Step in an Operation, the Step screen will close and the User will need to click on the Open Operation link. If there are required Actions, they will appear with an asterisk, i.e., • [Inspect\\*](#) . If the Action is not completed, then the Complete Step link will not appear.

## Verify Quantity at Start/Complete Step

A Step may be set up to have the quantity of items in the Work Order verified at the Start and/or Complete of a Step.



The image shows a dialog box titled "Verify Quantity". Inside the dialog, there is a text prompt "Enter the physical quantity of items in this work order." followed by a text input field. At the bottom right of the dialog is an "OK" button.

Figure 61 Verify Quantity Screen

Type in the Quantity and click the OK button. If the Qty does not match the Quantity as listed on the Work Order Header, the screen will not close and the Step cannot be completed until the count is correct.

## Message Tab

The tabs for the Steps are almost identical to those on the Work Order. The difference is that the Step contains a Message Tab.

The Message tab can contain three different types of messages.

**Work Order#: 201402-T030**

<b>Status:</b> InProc	<b>Main Product:</b> Product 2 -AC8
<b>Cat/Subcat:</b> /	<b>Process(Rev):</b> GKI Die Flow (03)
<b>Priority:</b> 63	<b>Operation(Rev):</b> Die Attach (01)
<b>Start Date:</b> 1/9/2014	<b>Operation Desc:</b> Die Attach
<b>Due Date:</b> 1/16/2014	<b>Next Operation:</b> Cure (01)
<b>Test/ECO:</b> /	<b>Step:</b> Oven Check
<b>Type:</b> Production	<b>Quantity:</b> 12.000000000

**Actions:**

- [Suspend Step](#)
- [Log Comment](#)
- [Go To...](#)
- [Complete Step](#)

**Message** | **Work To Be Done** | **History** | **Documents**

Check the status of the available Assets at the bottom of this message Window.  
Please be sure that the "OVEN" you plan to use at the next operation is "UP" and "QUALIFIED" (no overdue work orders).

This step checks/displays the status of the available OVENS to cure the Die Attach in the next operation.  
Click the Complete Step Action.

Asset: Oven 1 is in UpTime StandBy (NoOperator)  
**Asset: Oven 1 has overdue work order 1: PM QUARTERLY**  
 Asset: Oven 2 is in UpTime Production  
 Asset: Oven 3 is in UpTime StandBy (NoOperator)

The following attributes are currently set up as:  
 Product: Cure160 Oven Temp = 163  
 WorkOrder: Package Type = Other

Help OK

Figure 62 Message Tab

1. Message: contains alphanumeric text to provide instructions, information, etc.
2. Asset: shows the status of a selected Asset along with any message regarding overdue work orders (highlighted in red). Certain overdue work orders may prevent the start of an Asset.



**Assets in Uptime Production Status may or may not allow the Asset to be started. If the Step has been set to allow multi-track in (multiple lots can be worked by an Asset), then the Asset can be in an Uptime Production status. Otherwise, it must be in Uptime Standby.**

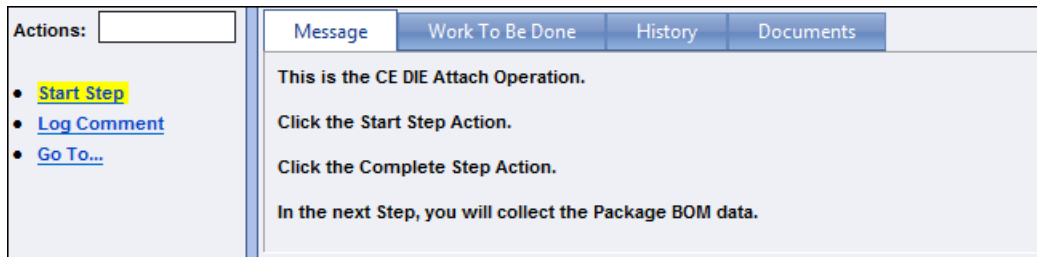
3. Attributes: displays the values previously associated to selected Attributes within the Work Order or the Product.

## Step Actions

### Standard Actions

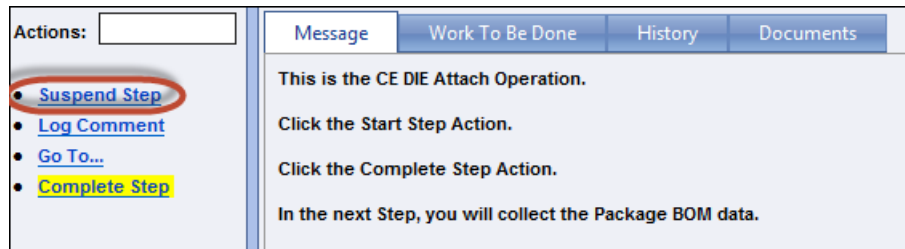
The following Actions are standard on the Step screen:

- **Start Step:** appears for only the first Step in an Operation, User must click in order to begin processing the Step. Additional Actions will appear as set up for the Step.



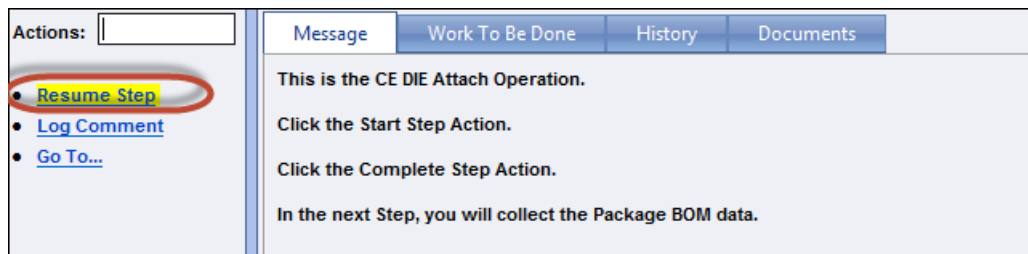
**Figure 63 Start Step Action**

- **Suspend Step:** puts the Step and the Work Order in the Suspend status, this Action does not provide a field for including Comments. Step window closes. User must click on Open Operation link to return and resume work.



**Figure 64 Suspend Step Action**

- **Resume Step:** User can resume working on the Step and the Work Order returns to InProc status. Action does not provide a field for including Comments.



**Figure 65 Resume Step Action**

- **Log Comment:** User can log Comments to the History of the Step (and therefore also the Work Order)

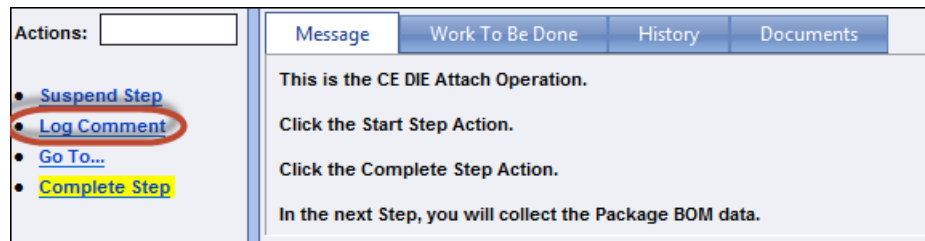


Figure 66 Log Comment Action

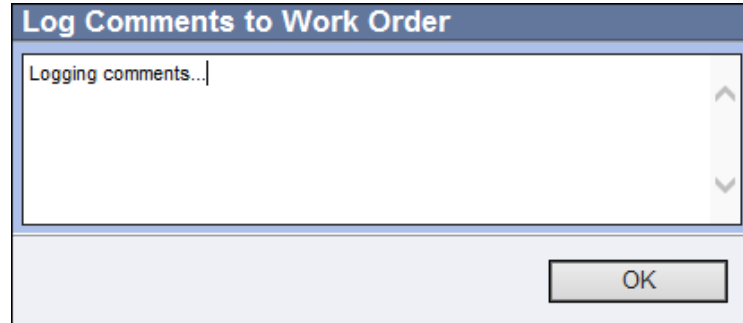


Figure 67 Log Comment Screen

- Go To: User can move to another Step within the Operation without starting/completing the current Step. User selects the Step from a drop-down list, enters Comments accordingly and the screen will change to the Step upon clicking the OK button. The Go To action will be logged in the Work Order History.

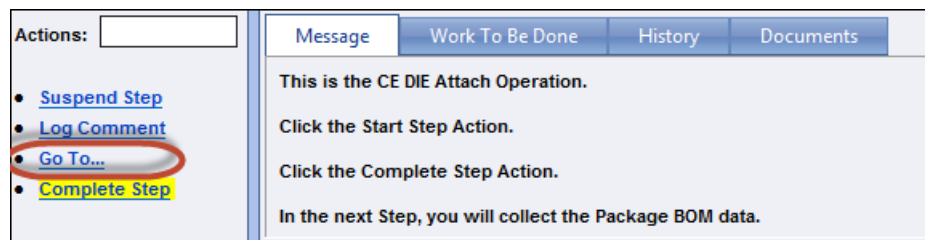


Figure 68 Go To Action

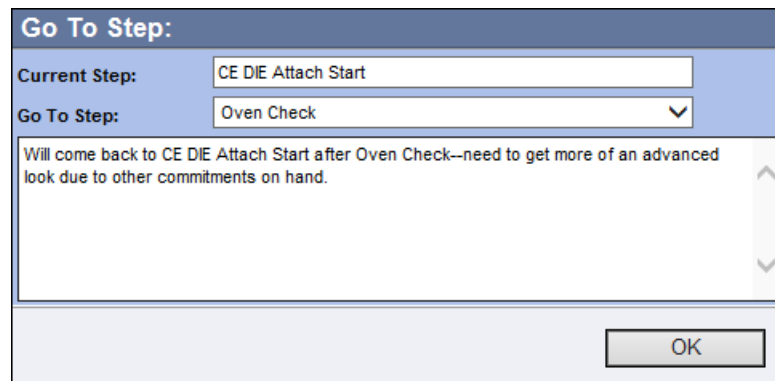


Figure 69 Go To Step Screen

- **Complete Step:** closes the Step and takes User to the next Step screen or back to the Work Order processing screen if the closed Step was the last one in an Operation

<b>Actions:</b> <ul style="list-style-type: none"> <li>• <a href="#">Suspend Step</a></li> <li>• <a href="#">Log Comment</a></li> <li>• <a href="#">Go To...</a></li> <li>• <b><a href="#">Complete Step</a></b></li> </ul>	<b>Message</b>   <b>Work To Be Done</b>   <b>History</b>   <b>Documents</b>
	<p>Check the status of the available Assets at the bottom of this message Window. Please be sure that the "OVEN" you plan to use at the next operation is "UP" and "QUALIFIED" (no overdue work orders).</p> <p>This step checks/displays the status of the available OVENs to cure the Die Attach in the next operation.</p> <p>Click the Complete Step Action.</p>

**Figure 70 Complete Step Action**

Work To Be Done   Qty Detail   Serial #'s   Operations/Steps   History   WO Attributes   Prod Attributes							
Views ▾							
Date Time	User	Action	Operation (Rev)	Step	Message	Notes	Flagged
3/30/2015 02:30:52 PM	Admin	Start	Die Attach (01)	Oven Check	Step was started.		False
3/30/2015 02:24:13 PM	Admin	Resume	Die Attach (01)	CE DIE Attach Start	Step was resumed.		False
3/30/2015 02:23:11 PM	Admin	Suspend	Die Attach (01)	CE DIE Attach Start	Step was suspended.		False
3/30/2015 02:21:54 PM	Admin	Start	Die Attach (01)	CE DIE Attach Start	Step was started.		False
3/30/2015 02:19:54 PM	Admin	HoldRelease	Die Attach (01)	CE DIE Attach Start	Work Order was released from hold. Reason: Asset Available; Comments: None		False
3/30/2015 02:19:42 PM	Admin	Hold	Die Attach (01)	CE DIE Attach Start	Work Order was put on Hold. Reason: Operation Alarm; Comments: Operation Alarm: WO Start Vapor (01); span is Less_Than 1.000000000 Minutes		False
3/30/2015 02:19:39 PM	Admin	HoldRelease	Die Attach (01)	CE DIE Attach Start	Work Order was released from hold. Reason: Asset Available; Comments: None		False
3/30/2015 02:18:57 PM	Admin	Complete	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Step was completed.		False
3/30/2015 02:18:57 PM	Admin	Hold	Die Attach (01)	CE DIE Attach Start	Work Order was put on Hold. Reason: Process Check; Comments: Advanced: Process Check		False
3/30/2015 01:42:53 PM	Admin	Combine	WO Start Vapor(01)	010 - Collect WO Start Attributes (Attr)	Work Order 201514-T065 for Product Product 2 -AC8 for Batch Number 201514-T065 of qty 15.000000000 was combined into this Work Order.		False

**Figure 71 Example of Step and Work Order History of Standard Actions**

Work To Be Done   Qty Detail   Serial #'s   Operations/Steps   History   WO Attributes   Prod Attributes							
Views ▾							
Date Time	User	Action	Operation (Rev)	Step	Message	Notes	Flagged
3/30/2015 02:30:52 PM	Admin	<b>GoTo</b>	Die Attach (01)	CE DIE Attach Start	GoTo conducted to Step: Oven Check. Comments: Will come back to CE DIE Attach Start after Oven Check--need to get more of an advanced look due to other commitments on hand.		False
3/30/2015 02:30:52 PM	Admin	Start	Die Attach (01)	Oven Check	Step was started.		False

**Figure 72 Example of Work Order History of Go To Action**



### Set Attribute Actions

Users may be requested to provide information that will get logged to the Work Order, a Batch Number(s) and/or Serial Number(s). Attributes are single instance data collections that can be changed, but there is no history of the change. The current value is what is visible onscreen and in Reports.

For more detail on how to enter values for different types of Attributes, see the Data Collection portion of Chapter 1: Introduction.

### Work Order Attributes

In WIP, WO Attributes can be used to collect data that can change the route of the Product in the flow based on the values of the data. Not all Steps are set up to influence the route, some data may be collected just for history and reporting.

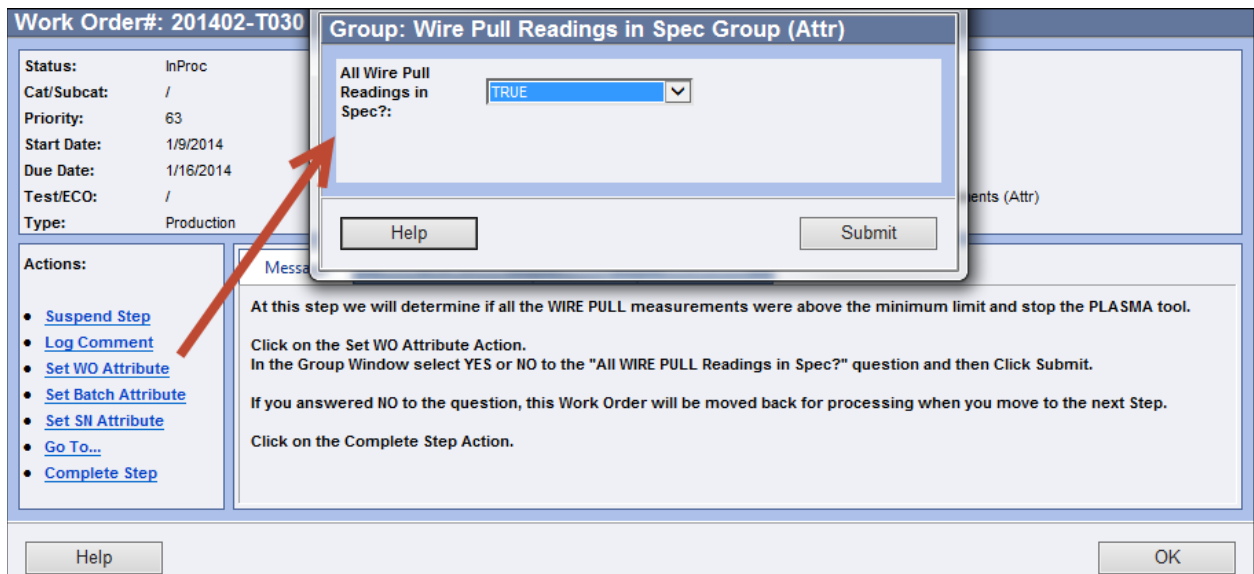


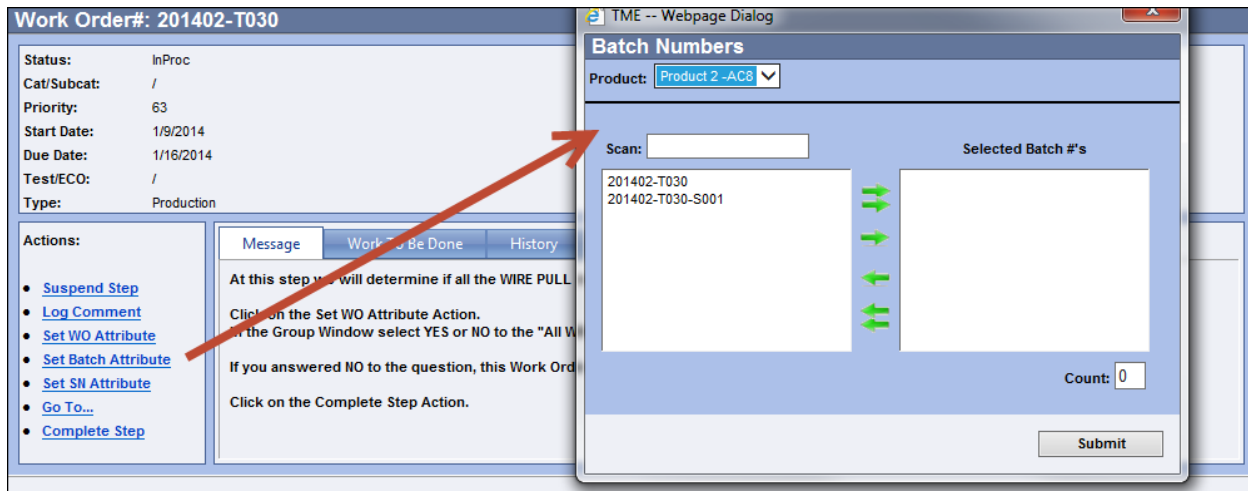
Figure 73 Set WO Attribute Screen

For example, per the screen shot above, a Condition has been set up that will determine the route to be taken upon completing this Step. If the User selects "True," then the route will move to the next Step in the Operation or to the first step of the next Operation (if current Step is the last in its Operation). If the User selects "False," then the route will go back to a previous Step in the current Operation, the first Step in another Operation, and possibly even to a Step in another Operation in another Process.

This feature is set up at the Operation level and to the User processing the Work Order, is automatic. The User just needs to provide the requested information and the route will automatically be determined.

## Batch Number Attributes

Data collected via Batch Number Attributes is for history and reporting only. These values will “follow” the Batch Number through WIP and will “stick” once it is converted out of WIP and into Inventory.



**Figure 74 Batch Number Selection for Set Batch Attribute Action**

Select the correct Product from the drop-down list, scan or select the applicable Batch Number(s) in the same manner as the Serial Number selection screen (Figure 41 Serial Numbers Selection Screen from Split Work Order). Click Submit.



**Figure 75 Batch Attribute Screen**

Enter the attribute value(s) accordingly and click Submit.

## Serial Number Attributes

Data collected via Batch Number Attributes is for history and reporting only works in the same manner as for Batch Number Attributes but using the Serial Number selection screen instead (Figure 41 Serial Numbers Selection Screen from Split Work Order).


### Entering Values

If the variable is required, it may have a default entry already applied. If the default entry applies, then the User does not need to make any changes. If the default entry is incorrect for the Asset, then the User will need to change the value accordingly.


- Text, Date, Number, List, and Checkbox Variables

To enter a value into a Text variable, click in the field and type the entry. For a variable that requires a Date, click on the Open the Calendar Popup icon and select the date. Some variables require the entry of a Number, click in the field and type in the number. For those variables with a drop-down List, click on the arrow on the right side of the drop-down field and select the appropriate entry. If a variable has a Checkbox, click the checkbox if the value is to be applied to the Asset.

- Document Variable

To upload a file or enter in a URL address for a Document variable, click on the Attach Doc icon  to the right of the field. The Document Selector screen will appear. If uploading a file, click on the Select button and browse to the file. If no Select button is available, type in the full URL address for the document. Click Save when finished. The Document name will appear in place of "No Document Selected" or the name of the previously uploaded file.

- Formula Variable

To view the calculation for a Formula prior to saving the record, make sure all number variables have been populated and click on the Calculate icon  to the right of the formula field. If the calculation cannot complete due to the number variables not being filled in (or the numbers and/or calculation are not within preset limits), there will be "--Error--" inserted into the field. Otherwise, the formula will calculate and populate the result.



Preview Group	
Square Footage:	32.5
Width:	5
Height:	7
Length:	6.5
<div>Test</div>	

**Figure 76 Example of Numbers and Formula Variable Group**

### Auto Set Attributes

Steps may also be set up to automatically set Work Order attributes at the Start of Completion of a Step.

The screenshot shows the 'Attribute: New' dialog box. It has a menu bar with 'File', 'Actions', and 'Help'. Below the menu is a toolbar with icons for 'Save and Close', a plus sign, and a question mark. The main area is titled 'Attribute: New' and contains a 'Details' tab. Under the 'Details' tab, there are several fields: 'Step Event' is set to 'Start', 'Group' is set to 'MetCDTarget(Group)', 'Active' is checked, 'Variable' is set to 'MetCDTarget', and 'Value' is set to 'Constant' with a dropdown menu showing 'TRUE'.

**Figure 77 Example of Auto Set Attribute Setup**


For example, per the screenshot above, the MetCDTarget attribute for a Work Order will be set to TRUE at the Start of the Step for which this has been set. This is automatic and no action is taken by the User processing the Work Order.

### **Data Collection**

Multi-instance data can be collected against Work Orders, Batch Numbers and Serial Numbers as well. This data can be collected over and over again and will not be overwritten. Data collected via this method does not affect the route of the Work Order, it is for historical and reporting purposes only.

The screens and entering values are identical to that of setting Attributes with the addition of Totalizer and SPC.

- Totalizer Variable

The Totalizer variable replaces the meter feature from previous versions of TME. This variable works in exactly the same way as the meters, it is that the data is collected in a different way. To enter a value, type it in to the totalizer field. If the value does not fall within the preset limits, a popup message will appear upon submission of the data collection. Change the value or cancel the data collection by closing the screen. To view previous readings, click on the  icon to the right of the field. **NOTE:** if the totalizer is associated with more than one object, the readings apply to all of the objects associated with the totalizer.

- SPC Variable

Enter the values of the points in the fields provided.

Asset: 00 Test - Collection: SPC: Thickness

Thickness: 1:  2:

Width: 1:  2:

Help Submit

To view chart(s) of previously entered data

Figure 78 SPC Data Collection Screen

The chart(s) may open automatically upon submittal for all samples in the collection for which the TME Administrator set up automatic viewing. If not, and the User wants to see the chart(s), he/she needs to access the Data Collection screen again and click on the look up icon to the right of the first field for each sample.

To view the data in a grid format that can be searched, click on View Data in Grid.



Figure 79 SPC Chart for Single SPC Sample

Thickness								
Index	Log Date	User	Asset ID	Collection	X-Bar	Sigma	Range	Violations
29	5/7/2014 03:33:37 PM	Admin		SPC: Thickness	1.025	0.049497474683059	0.0700000000000001	
28	5/1/2014 08:33:50 AM	Admin	00 Test	SPC: Thickness	1.26	0.325269119345811	0.46	Any data value beyond Spec Limit
27	5/1/2014 08:33:14 AM	Admin	00 Test	SPC: Thickness	1.235	0.304055915910217	0.43	Any data value beyond Spec Limit
26	5/1/2014 08:32:41 AM	Admin	00 Test	SPC: Thickness	1.23	0.311126983722082	0.44	Any data value beyond Spec Limit
25	5/1/2014 08:31:14 AM	Admin	00 Test	SPC: Thickness	1.23	0.311126983722082	0.44	
24	3/12/2014 08:20:37 AM	Admin	00 Test	SPC: Thickness	1.31	0.410121933088198	0.58	Any data value beyond Spec Limit
23	3/12/2014 08:18:54 AM	Admin	00 Test	SPC: Thickness	1	0	0	
22	3/10/2014 11:54:24 AM	Admin		SPC: Thickness	1.015	0.00707106781185724	0.01	

**Figure 80 Grid View**

○ *Point Detail Screen*

Click on a data point within either chart to display the Point detail screen for that point. The screen shows the Sub Group designation, control limits, X-bar, Range, Cp, Cpk, values reported and the violation(s) of any run rules.

The data point can be excluded from calculations by selecting the checkbox "Exclude from Calculations." The Exclude from Calculations tag will display in the charts above the data point to indicate its exclusion.

Thickness

Sub Group: 50

User: Admin

Collection: SPC: Thickness

Date: 10/22/2014 10:18:10 AM

X-Bar: 50.00

Range: 0.00

Sigma: 0.00

Cp: 0.16

Cpk: 0.02

☐ Exclude from calculations  
☐ Acknowledge

X-Bar

UCL: 1.08

CL: 1.03

LCL: 0.98

Range

0.22

0.08

0.00

Sigma

0.15

0.06

-0.03

Asset: 00 Test

#	Current Value	Reported Value
1	50.00	50.00
2	50.00	50.00

Terminator #:

Violations: Any data value beyond Reasonability Limit


Assignable Cause:

Corrective Action:

Comments:

OK


**Figure 81 Data Point Screen**

The data point can be excluded from calculations by selecting the checkbox "Exclude from Calculations." The Exclude from Calculations tag  will display in the charts above the data point to indicate its exclusion.

If the point is in violation, it can be acknowledged by selecting the checkbox “Acknowledge”.

If a violation has been indicated, the Terminator #, Assignable Cause, Corrective Action and Comments may be typed in accordingly at this time (if not required immediately upon submitting the data). A popup screen will appear to let the Operator know what action must be taken when clicking OK and the entry is missing. **If the item(s) is required, the Operator will not be able to enter the next Sample until the missing item(s) has been submitted.** The operator will know that data cannot be collected for a variable then the caption is in red font on the Data Collection screen. He/she will have to click on the LookUp icon to get to the chart and then click on the point to open the detail screen and supply the missing data. Please see Appendix 7: OCAP for further details regarding Terminator #s.

Adjacent to the Terminator # field is an icon for viewing any document that has been associated to the Data Collection. This feature was designed in order to comply with OCAP standards. Please see Chapter 10 Settings: Variable Groups / Data Details for more information on how to associate a Document to the Collection and Appendix 7: OCAP for further details on OCAP standards.

To edit the data point, click the Edit link to the left of the value number that needs to be changed. Type in the new values and click Update to save the change or Cancel to cancel. Enter in a Comment. TME requires that a Comment be provided anytime a point is edited. A popup will appear stating the requirement if the Operator clicks OK and a Comment has not been submitted. The Modified Data tag  will display in the charts above the data point to indicate its modification.

Click the OK button to close the screen.





Definitions of run rule violations as well as how the SPC metrics are calculated are provided in Appendix 5: SPC Calculations.

- SPC Formula

SPC Formula variables work similarly to regular Formula variables except that the value calculated is then charted in an SPC chart. Numerical values are entered and the SPC Formula calculates off those numbers. The values for the SPC Formulas are treated as single sample SPC entries and have targets, control limits, cpk calculations, etc.





















In addition to calculating SPC formulas off of numerical values, TME can calculate SPC formulas off the collection of other SPC variables. An example would be using an SPC Formula to chart the Xbar/R of the minimum values of several SPC variables.

**Asset: 00 Test - Collection: Etch Rate (SPC Calculated)**

Pre-Etch Mean:	<input type="text" value="21"/>
Post-Etch Mean:	<input type="text" value="16"/>
Pre-Etch Range:	<input type="text" value="1"/>
Post-Etch Range:	<input type="text" value="2"/>
Etch Rate Mean:	<input type="text" value="18.5"/>  
Etch Rate Range:	<input type="text" value="1.5"/>  

**Figure 82 SPC Formula Data Collection Screen**

**Asset: 00 Test - Collection: SPC Variables into Formulas**

Thickness:	1: <input type="text" value="5"/>  	
	2: <input type="text" value="8"/>	
Length:	1: <input type="text" value="2"/>  	
	2: <input type="text" value="3"/>	
Width:	1: <input type="text" value="1"/>  	
	2: <input type="text" value="1"/>	
Sum of Minimums:	<input type="text" value="8"/>  	 Formulas that will plot results into SPC Charts     Formula - but not SPC
Sum of Maximums:	<input type="text" value="12"/>  	
Length Sigma:	<input type="text" value="0.707106781186548"/>  	
Width Range:	<input type="text" value="0"/>  	

**Figure 83 SPC Formula Data Collection Based on SPC**



- Run Rules

Run Rules may be set up by the TME Administrator to provide consequences should an entry be made that does not follow the “rules” for the given object. Consequences may include the displaying a message, sending an email, changing the equipment status (when associated with an Asset), or generating a work order (when associated with an Asset). These consequences can be set off when the entry does not equal, contain, does equal, is less than, etc., a given set of values. For an SPC variable, the run rules are based on violations to Western Electric rules (definitions for these rules are provided onscreen when set up).

The screenshot shows a 'Run Rule: New' window. On the left is a sidebar with 'Details' and 'Information' tabs. The main area contains the following fields:

- Group:** Clip Group (Attr) [dropdown]
- Variable:** Clip [dropdown]
- Active:** ☒
- Criteria:** Equal To [dropdown]
- Value:** CLIP 4 [text input] and CLIP 4 [dropdown]
- Actions:**
  - ☐ Display Message
  - ☒ Send Email
  - ☐ Change Equipment Status To: DownTime, Complete (Scheduled) [dropdown]
  - ☐ Generate Work Order - Process Rev: General [text input]

**Figure 84 Example of Run Rules Setup (See Chapter 10 Settings for More Detail)**

## Start/Stop Asset Action

Steps may require the Start and/or Stop of an Asset for the purpose of tracking equipment uptime as well as genealogy. Click on the Start Asset link to start an Asset and on the Stop Asset link to stop one.

Work Order#: 201402-T030

Status: InProc Main Product: Product 2 -AC8  
Cat/Subcat: / Process(Rev): GKI Die Flow (03)  
Priority: 63  
Start Date: 1/9/2014  
Due Date: 1/16/2014  
Test/ECO: /  
Type: Production

Actions:

- [Suspend Step](#)
- [Log Comment](#)
- [Start Asset](#)
- [Go To...](#)
- [Complete Step](#)

Asset: CURE 1 [Repair Request](#)

Status:

Recipe: Recipe 1 Tool: 03-06985  
05-16182

Help Start Asset

Asset: CURE 2 IS IN

Help OK

**Figure 85 Start Asset Screen**

Only those Assets that have been set up for the Step and are available will populate the drop down. An Asset is available if it is in an Uptime Standby state without overdue Work Orders (as defined for the Step, not all overdue Scheduled Work and Work Orders will prevent the starting of an Asset). An Asset may also be considered available when in an Uptime Production state if the Step allows for multi-lot track in (more than one Work Order using the same piece of equipment at a time).

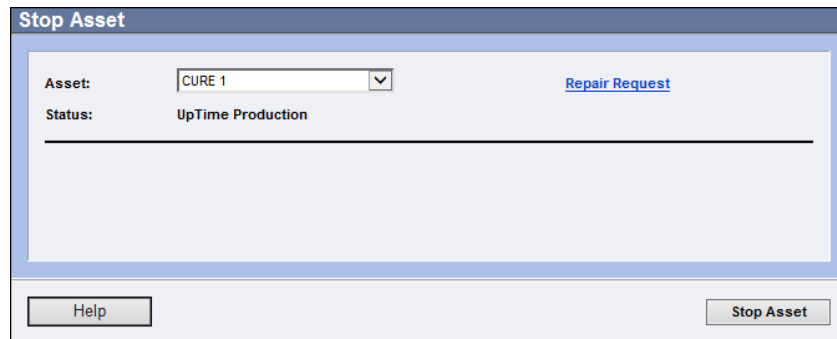
The Recipe and Tool fields may contain values as determined by the Product of the Work Order and the Asset selected. These are for informational purposes to direct the User to the proper recipe and tool(s) to use at this Step with the Asset.

If an available Asset appears to be broken, click on the Repair Request link and submit a maintenance Work Order. The Asset will go into a Downtime Repair Request state and will no longer be considered available for starting.

Select the Asset to Start and click on the Start Asset button. The Start Asset Screen will close and the History updated.

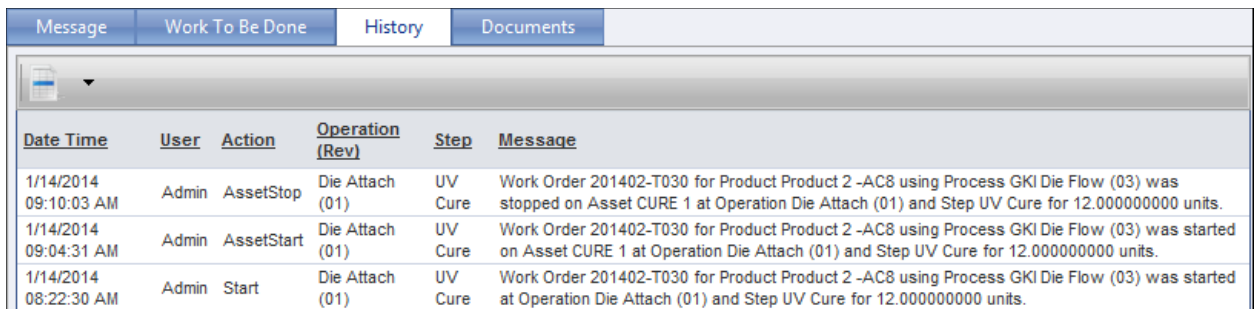
The Stop Asset link may become available in place of the Start Asset. Click on it to

Stop the Asset. It is possible that the Stop Asset link may not appear until another Step in the Operation as work with the Asset may occur over multiple Steps. It is also possible that it has been configured to open and submit the Stop Asset screen automatically (User will only see a flicker of the screen). The History tab will show that the Asset was indeed stopped.



The 'Stop Asset' screen is a web-based form. At the top, it has a title bar 'Stop Asset'. Below the title bar, there are two main sections. The first section contains a label 'Asset:' followed by a dropdown menu showing 'CURE 1' and a button labeled 'Repair Request'. The second section contains a label 'Status:' followed by the text 'UpTime Production'. At the bottom of the screen, there are two buttons: 'Help' on the left and 'Stop Asset' on the right.

Figure 86 Stop Asset Screen



The 'History' tab shows a table of asset history. The table has columns: Date Time, User, Action, Operation (Rev), Step, and Message. The data is as follows:

Date Time	User	Action	Operation (Rev)	Step	Message
1/14/2014 09:10:03 AM	Admin	AssetStop	Die Attach (01)	UV Cure	Work Order 201402-T030 for Product Product 2 -AC8 using Process GKI Die Flow (03) was stopped on Asset CURE 1 at Operation Die Attach (01) and Step UV Cure for 12.000000000 units.
1/14/2014 09:04:31 AM	Admin	AssetStart	Die Attach (01)	UV Cure	Work Order 201402-T030 for Product Product 2 -AC8 using Process GKI Die Flow (03) was started on Asset CURE 1 at Operation Die Attach (01) and Step UV Cure for 12.000000000 units.
1/14/2014 08:22:30 AM	Admin	Start	Die Attach (01)	UV Cure	Work Order 201402-T030 for Product Product 2 -AC8 using Process GKI Die Flow (03) was started at Operation Die Attach (01) and Step UV Cure for 12.000000000 units.

Figure 87 Example of Start/Stop Asset History



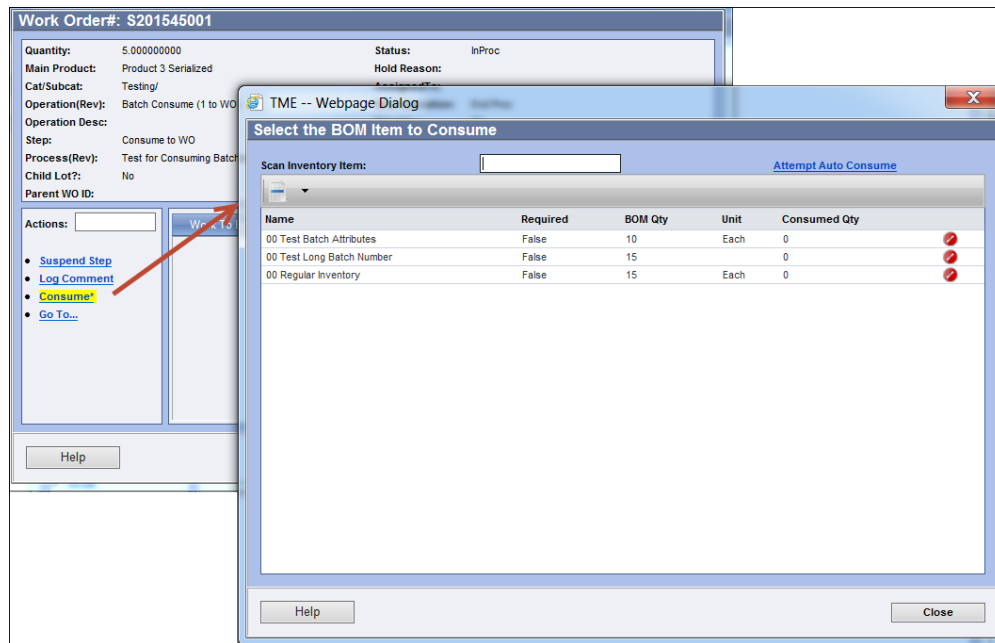
All Assets started within a WIP Work Order can be stopped all together by clicking on Edit Work Order link from Work Order processing screen and then clicking Actions on the toolbar and selecting "Stop All Assets."



Figure 88 Popup Message Upon Stopping All Assets via Edit Work Order

## Consume Action

Inventory Items (consumables) are consumed into the Product via the Consume link. The Select the BOM Item to Consume screen will appear. It will already be filtered to the Items that are to be consumed. If an Item is Required ("True" value in Required column), then the Step cannot be completed until the BOM Qty for that Item has been consumed. The full quantity does not need to be consumed in a single transaction; the User may perform the transaction several times over the course of processing the Step. The Select the BOM Item to Consume screen will show how much has been Consumed so that the User can keep track.



**Figure 89 Consume Action - Select the BOM Item to Consume Screen**

### Auto Consume:

If the BOM Items have been configured with default Locales and Batch Numbers, the User can click on the Attempt Auto Consume link and TME will automatically consume the appropriate quantity. The screen will refresh with the Consumed Qty. Items that do not have enough quantity for the default Locale/Batch Number, will have a marker to indicate the necessity to manually consume.

### Manual Consume:

If there is not enough quantity or it's necessary to manually consume, double-click on the first Item to Consume. The Action screen will appear.

The screenshot shows the 'Action' screen with the following details:

- Title Bar:** Action
- Tabs:** General (selected), Attributes, Comments
- Product:** Product 2 -AC8
- Batch:** 201402-T030
- Scan Barcode:** [Empty text box]
- From:** Locale
- Locale:** MainBldg 1Floor 1Room 101
- Item:** MASSG2X A 2DIE
- Batch:** [Empty text box]
- BOM Qty Req:** 12 Each
- Trans Qty:** [Empty text box]
- Buttons:** Add, Help, Submit

**Figure 90 Consume Action Screen**

Choose the Product and Batch Number from the drop-downs to which the Item is to be Consumed.

Select where the Items are being consumed from: Locale, My Inventory (see the Actions portion of Chapter 5: Inventory for more detail), or This Work Order (see the Take and Put Inventory portion of this Chapter for more detail).

Scan the Barcode value of the Locale or choose via the Locale link.

The Item is already populated. If it is a Batched Item, choose the Batch Number. If it is serialized, choose the Serial Number(s) from the Serial Numbers link that will appear on the screen.

Enter the Trans Qty (will be populated if selecting Serialized Inventory). Click on the Add button to add to the list at the bottom of the screen. Click Submit when ready.

Repeat for all Items to be Consumed. The History will update and the Inventory Transaction log will record the transactions as well. The on hand quantity for the items consumed will be adjusted accordingly.

### ***Inspect Action***

The Inspect Action allows for the documentation of the inspection of Items in the Work Order. Click on the Inspect Link.

**Figure 91 Inspect Items from Work Order Screen**

Select the Product, Batch Number and/or Serial Number(s) that have a defect. Choose the Position and Defect code (drop-down lists managed by the TME Administrator). Enter in the Quantity if not already populated (count of Serialized Items) and click on the Add button. Repeat as necessary and Submit when ready.

Item	Batch	Serial#	Position	Defect	Quantity
Product 2 -AC8	201402-T030	201402-T030-001	1-A	CBGA Component - Blistering or peeling metal/coat	1
Product 2 -AC8	201402-T030	201402-T030-011	1-A	CBGA Component - Cold solder joint	1

**Figure 92 Example of Populated Inspection Screen**

### ***Sign Off Action***

The Sign Off functions as a collection of signatures for a Step. It can be set up to require Sign Off by the current User only, another User or both. The other/additional User will need to be a member of a specific Access Group as set up at the Step. If a User who is not a member of the Group tries to do the Sign Off, it will not be accepted and the Step cannot be Completed.

The Other or Additional Users do not need to be logged in to TME in order to complete the Sign Off, they can complete the Sign Off from the screen regardless of who is logged in (i.e., the Current User opens the Sign Off screen and steps aside to allow the other User to complete the Sign Off). In fact, the screen can be closed for a period of time, reopened and the Additional User can then do the Sign Off. Once all Sign Offs have been confirmed, the Complete Step link will appear.

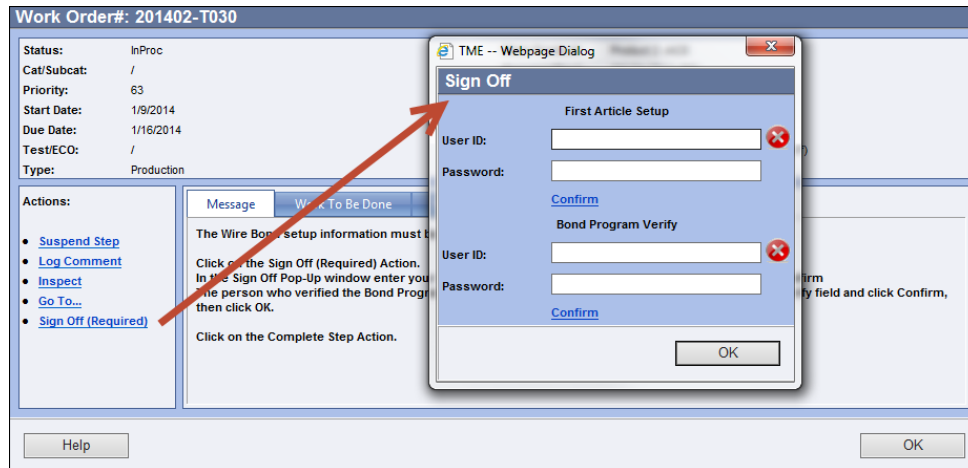




Figure 93 Sign Off Screen

For example, per the screenshot above, the current User must Sign Off that he/she set up the First Article and a second User must Sign Off verification of the Bond Program. To Sign Off, enter in the User ID and Password, click the Confirm link. If accepted, the

 will become .

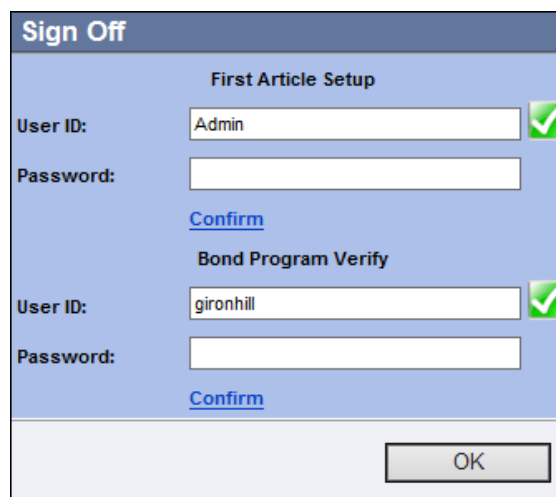
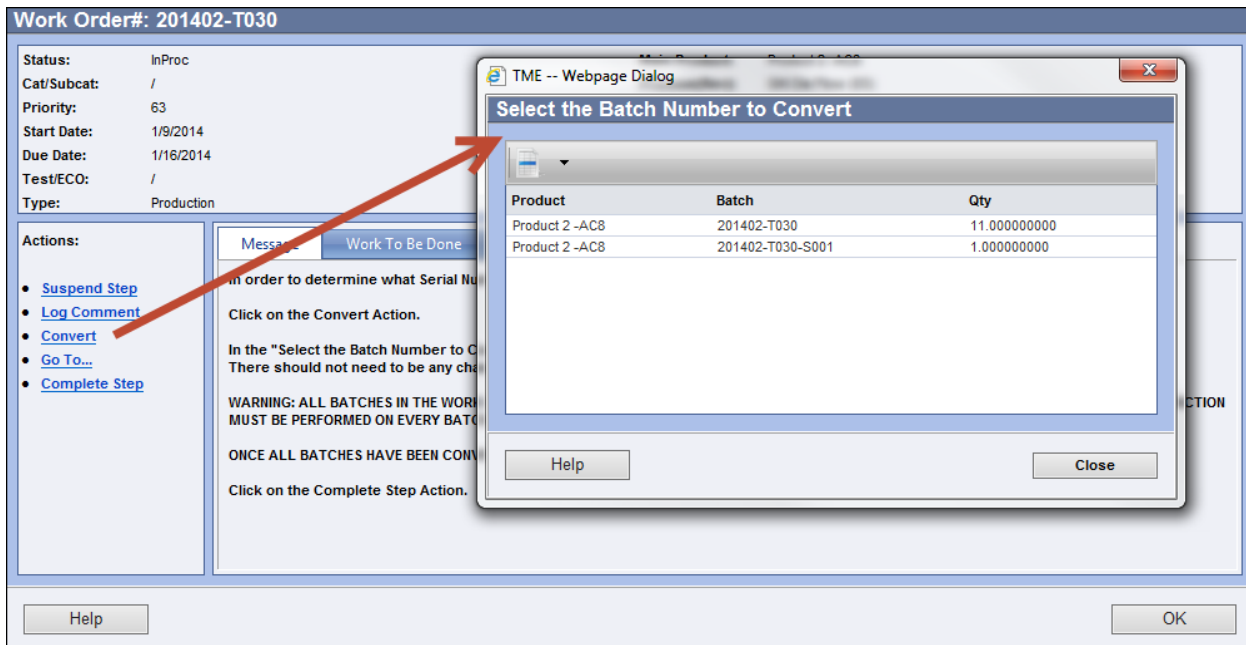


Figure 94 Completed Sign Off

## Convert Action

The Convert Action takes the current Product in the Work Order and Converts into other Products. The setup of the conversion (what Products convert into which Products and what Quantity) is done by the TME Administrator.

Click on the Convert link. The screen will only show those Products/Batch Numbers contained in the Work Order.



**Figure 95 Select the Batch Number to Convert Action**

Double-click on the Product/Batch Number to Convert. Choose the Conversion Name from the drop-down list. There might be more than one if the current Product can have different possible combinations of Products it can be converted into.



Batch: 201402-T030

Product:

Product 2 -AC8

Batch Number:

201402-T030

Quantity:

11.000000000

Conversion Name:

Convert to Die

Serial Number	Product	Quantity
201402-T030-001	MASSG A 2DIEPL	50.00000000
201402-T030-001	MASSG A 2DIEWP	20.00000000
201402-T030-001	MASSG A 2DIEBA	10.00000000
Total		80.00000000
201402-T030-002	MASSG A 2DIEPL	50.00000000
201402-T030-002	MASSG A 2DIEWP	20.00000000
201402-T030-002	MASSG A 2DIEBA	10.00000000
Total		80.00000000
201402-T030-004	MASSG A 2DIEPL	50.00000000

Help

Submit

Figure 96 Convert Product Screen

If the conversion has been setup to allow for the adjustment of the quantities, make those adjustments accordingly. Click Submit when ready.

Repeat for all Product/Batch Numbers. Close the Select Batch Number to Convert Screen when finished.



Be careful as the converted Products will appear in the Select Batch Number to Convert screen once submitted. If there are multiple batches of the initial Product, they can get mixed in with the converted Product.

Message						Work To Be Done	History	Documents
Date Time	User	Action	Operation (Rev)	Step	Message			
1/14/2014 10:07:56 AM	Admin	Convert	Mark (Jet) (01)	020 - Convert to Serialized Product (Conv)	Work Order Product Conversion from Product 2 -AC8/201402-T030-S001/1.000000000 to MASSG A 2DIEBA/T201403034/10.00000000, MASSG A 2DIEWP/T201403035/20.00000000, MASSG A 2DIEPL/T201403036/50.00000000			
1/14/2014 10:06:06 AM	Admin	Convert	Mark (Jet) (01)	020 - Convert to Serialized Product (Conv)	Work Order Product Conversion from Product 2 -AC8/201402-T030/11.000000000 to MASSG A 2DIEBA/T201403001/10.00000000, MASSG A 2DIEWP/T201403002/20.00000000, MASSG A 2DIEPL/T201403003/50.00000000, MASSG A 2DIEBA/T201403004/10.00000000, MASSG A 2DIEWP/T201403005/20.00000000, MASSG A 2DIEPL/T201403006/50.00000000, MASSG A 2DIEBA/T201403007/10.00000000, MASSG A 2DIEWP/T201403008/20.00000000, MASSG A 2DIEPL/T201403009/50.00000000, MASSG A 2DIEBA/T201403010/10.00000000, MASSG A 2DIEWP/T201403011/20.00000000, MASSG A 2DIEPL/T201403012/50.00000000, MASSG A 2DIEBA/T201403013/10.00000000, MASSG A 2DIEWP/T201403014/20.00000000, MASSG A 2DIEPL/T201403015/50.00000000, MASSG A 2DIEBA/T201403016/10.00000000, MASSG A 2DIEWP/T201403017/20.00000000, MASSG A 2DIEPL/T201403018/50.00000000, MASSG A 2DIEBA/T201403019/10.00000000, MASSG A 2DIEWP/T201403020/20.00000000, MASSG A 2DIEPL/T201403021/50.00000000, MASSG A 2DIEBA/T201403022/10.00000000, MASSG A 2DIEWP/T201403023/20.00000000, MASSG A 2DIEPL/T201403024/50.00000000, MASSG A 2DIEBA/T201403025/10.00000000, MASSG A 2DIEWP/T201403026/20.00000000, MASSG A 2DIEPL/T201403027/50.00000000, MASSG A 2DIEBA/T201403028/10.00000000, MASSG A 2DIEWP/T201403029/20.00000000, MASSG A 2DIEPL/T201403030/50.00000000, MASSG A 2DIEBA/T201403031/10.00000000, MASSG A 2DIEWP/T201403032/20.00000000, MASSG A 2DIEPL/T201403033/50.00000000			
1/14/2014 09:59:26	Admin	Start	Mark (Jet) (01)	020 - Convert to Serialized	Work Order 201402-T030 for Product Product 2 -AC8 using Process GKI Die Flow (03) was started at Operation Mark (Jet) (01) and Step 020 - Convert to Serialized Product (Conv) for 12.000000000 units			

Figure 97 Example of Convert History

Work Orders User: Admin

WO Number	Main Product	Main Batch#	Total Qty	Category	SubCategory	Status	Start Date	Due Date	Priority	Operation	Operation Desc
S201351001			2.000000000			InProc	12/17/2013	12/24/2013	50	WO Start Vapor	WO Start Vapor
201403-T032	Product 2 -AC8	201403-T032	15.000000000			InProc	1/13/2014	1/20/2014	63	WO Start Vapor	WO Start Vapor
201402-T031	MASSG A 2DIEBA	T201402001	1200.000000000			Closed	1/9/2014	1/16/2014	63		
201402-T030-S001						Closed	1/9/2014	1/16/2014	63		
201402-T030	Product 2 -AC8	201402-T030	12.000000000			InProc	1/9/2014	1/16/2014	63	Wire Bond and Pull	Wire Bond and Pull

Work Order#: 201402-T030

Status: InProc  
Cat/Subcat: /  
Priority: 63  
Start Date: 1/9/2014  
Due Date: 1/16/2014  
Test/ECO: /  
Type: Production

Main Product: MASSG A 2DIEWP  
Process(Rev): GKI Die Flow (03)  
Operation(Rev): Mark (Jet) (01)  
Operation Desc: Mark (Jet)  
Next Operation: Cure! Updated (01)  
Step: 030 - Check and Start Mark (AStat&Asset)  
Quantity: 960.000000000

Actions:

- Edit Work Order
- Print Work Order
- Open Operation
- Log Comment
- Hold
- Split
- Combine
- Scrap
- Adjust
- Convert
- Reposition
- Change Process
- Take Inventory

Product	Batch	Quantity
MASSG A 2DIEBA	T201403001	10.000000000
MASSG A 2DIEWP	T201403002	20.000000000
MASSG A 2DIEPL	T201403003	50.000000000
MASSG A 2DIEBA	T201403004	10.000000000
MASSG A 2DIEWP	T201403005	20.000000000
MASSG A 2DIEPL	T201403006	50.000000000
MASSG A 2DIEBA	T201403007	10.000000000
MASSG A 2DIEWP	T201403008	20.000000000
MASSG A 2DIEPL	T201403009	50.000000000
MASSG A 2DIEBA	T201403010	10.000000000
MASSG A 2DIEWP	T201403011	20.000000000

Figure 98 Example of Change from Initial Main Product After Conversion (prior to refresh of Work Order Viewer)

Work Orders											User: Admin
WO Number	Main Product	Main Batch#	Total Qty	Category	SubCategory	Status	Start Date	Due Date	Priority	Operation	Operation Desc
S201351001			2.000000000			InProc	12/17/2013	12/24/2013	50	WO Start Vapor	WO Start Vapor
201403-T032	Product 2 -AC8	201403-T032	15.000000000			InProc	1/13/2014	1/20/2014	63	WO Start Vapor	WO Start Vapor
201402-T031	MASSG A 2DEBA	T201402001	1200.000000000			Closed	1/9/2014	1/16/2014	63		
201402-T030-S001						Closed	1/9/2014	1/16/2014	63		
201402-T030	MASSG A 2DEWP	T201403002	960.000000000			InProc	1/9/2014	1/16/2014	63	Mark (Jet)	Mark (Jet)

**Figure 99 Example of Change from Initial Main Product/Batch Number and Quantity After Conversion (after refresh of Work Order Viewer)**

### To Inventory

Once the WIP Process is complete, Product may be moved out of WIP into Inventory so that it can be transferred, consumed, etc. Click on the To Inventory link.

**Figure 100 Move to Inventory Screen**

Select the Locale to where the Product will be moved. Select the Product, Batch Number and/or Serial Number(s). If all Items are going to the same Locale, select the Transfer All checkbox. Enter the Quantity (pre-populated if Product is serialized) and click on the Add button. Repeat as necessary and Submit when ready.

**Move to Inventory**

General Comments

Locale: [AAT\IOPS3\IC1G09\IDPC DIE Storage \(7000\)](#)

Product: [MASSG A 2DIEPL](#) Transfer All: ☒

Batch: [T201403030](#) Quantity: 50.000000000

Add

Item	Batch	Serial#	Quantity
MASSG A 2DIEBA	T201403001		10.000000000
MASSG A 2DIEBA	T201403004		10.000000000
MASSG A 2DIEBA	T201403007		10.000000000
MASSG A 2DIEBA	T201403010		10.000000000
MASSG A 2DIEBA	T201403013		10.000000000
MASSG A 2DIEBA	T201403016		10.000000000
MASSG A 2DIEBA	T201403019		10.000000000
MASSG A 2DIEBA	T201403022		10.000000000
MASSG A 2DIEBA	T201403025		10.000000000

Help Submit

**Figure 101 Populated Move to Inventory Screen**

The Product will now have quantity within Inventory Module to which all future transactions take place.

## Notifications

TME contains the setup of Notifications throughout TME including WIP. These can be set up at the Work Order and Step levels. The triggers that will send out a Notification are:

1. Data Collect Run Rule Violation
2. Future Hold
3. Work Order Closed
4. Work Order Created
5. Work Order Rejected
6. Work Order Released
7. Work Order Items Scrapped
8. Work Order Items to Inventory
9. Work Order Step Complete
10. Work Order Step Resume
11. Work Order Step Started
12. Work Order Step Suspend

Any, all or none of them can be set up for any given Work Order/Step. Please see the Notifications section of the Settings and Tools Chapter).