DELMIAWorks

BOMs

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Contents

BOM-Manufacturing Configurations

Introduction

EnterpriseIQ is capable of generating material, assembly, and schedule requirements with extreme accuracy. In order to do this, EnterpriseIQ needs to know some precise information about your tooling and methods of assembly. This information is entered and edited using the BOM (Bill of Manufacture) module.

The BOM module provides the method for defining how parts are made in your environment. This information includes elements such as part number(s), material designation and usage, production times (cycles), packaging, process notes and instructions.

EnterpriseIQ uses the information in the standards in several areas of the system (such as in the creation of work orders and material purchasing requirements), therefore it is critical that the BOM's are accurate.

Note: The terms BOM, Manufacturing Standard, and Manufacturing Configuration all mean the same thing.

Unique Standards - The Key to Proper Production

Each manufacturing configuration must be unique to the way in which the parts are made. It will tell you how long the cycle is (rate of production), how much the parts weigh (material consumption), how many parts will be produced at a time, and what materials will be consumed during production. For every possible way that the parts can be made, there must be a *separate* manufacturing configuration.

If an item is produced in many different colors or with varying types of material, each item MUST have it's own manufacturing configuration with it's own unique configuration number. When **EnterpriseIQ** generates material requirements and scheduling estimates, it relies on the **unique** data pertaining to **each** item number.

Numbering Schemes for Configurations

Like customers, vendors and raw materials, manufacturing configurations must be uniquely identified via the Manufacturing Configuration Number/Routing Number combination.

The manufacturing configuration number is an alphanumeric field. This means it may contain numbers as well as letters. The user should create a manufacturing configuration numbering scheme that is simple and easy for everyone to understand.

Manufacturing Types

`There are several default Manufacturing Types in EIQ. Below is a list with a brief description of each:

ASSEMBLY	Similar to Generic BOM except Cycle Time on BOMs is in Hours instead of Seconds.
	Note: The Cycle time for the Assembly Mfg Type in the Estimating module is in seconds and not hours. When converting an Assembly manufacturing type Quote to BOM the system will convert the cycle time to hours.
ASSY1	Utilizes BOMs with processes attached that call out work centers, tools, labor and quality requirements. Uses Assembly Track and Assy Data for reporting and tracking. Labor reporting is done for each process and components are backflushed during labor reporting.
ASSY2	Same as ASSY1 except Work Centers are associated to the processes, and to the Assembly Line.
ASSY3	Similar to the other ASSY types except an Assembly Line is associated to the BOM, and by default, Final Assembly is used to report production.
	(Please see the ASSY Manufacturing documentation for more details on these MFG Types).
BLOWMOLD	Similar to Injection BOM except Runner/Sprue is changed to "Parison/Flash".
COMPLEX	Similar to Generic BOM except it has an icon to Designate Child Complex BOMs (this brings up a window called "Complex Visual BOM" where you can enter in additional info). Designed to simplify the scheduling process where multiple WO's are involved in producing a product and they are done on multiple work centers that make up a complex line. When a WO for the complex BOM is set up in first position on the Complex Line, all child work orders will automatically also be set up on their work centers in the line. (See Complex MFG Type BOMs for more information).
COMPOUND1	The Compound1 manufacturing type is used to create items with a unit of measure based on a weight such as grams or pounds. This manufacturing type is similar to Extrusion2 where there is a Lbs/Hr field, however there is no primary material. The item produced is made up of several components which also must have a weight type unit of measure. The components are assigned on the item details tab similar to the Masterbatch manufacturing type. (See Compound1 for more information).
DIECAST	Similar to Injection except Runner/Sprue is changed to "Runner/biscuit".
EXTRUSION	Item is Part Length with a typical unit of measure in feet. The BOM includes Feet/Lb and Lbs/Hr. Production is reported as a total length. (See Extrusions - General BOM Information for more information on the Extrusion MFG Types).

EXTRUSION2	Item is in part weight with a typical unit of measure in pounds. The BOM includes Lbs/Hr. Production is reported in total Lbs.
EXTRUSION3	Item is in part weight with a typical unit of measure in eaches. The BOM includes Lbs/Hr. Production is reported in total parts.
GENERIC	The most basic BOM structure used for manufacturing that does not fit any of the other more specific types. Like other standards, generics can consume finished goods, components, and packaging, and can include labor and overhead. (See Generic Standards for details).
INJECTION	Primary material, tooling info, cavitation and part weight information. (See Creating a New BOM for details).
JOBSHOP	Designed for toolmakers, die makers, and other short run, discrete manufacturers utilizing Generic BOMs. It provides visual routing and fast creation of new projects based on existing routing templates It simplifies production based on longer run times and tiered manufacturing processes, including coring, lathing, drilling, grinding and milling. It's recommended to have a separate EPlant for handling JobShop parts separate from regular manufacturing processes. For JobShop, you create a new project from the JobShop module and then build out the routing info with a BOM set up for each step in the routing process. (See the JobShop documentation for more information).
JOBSHOP2	Similar to JobShop in that it is designed for toolmakers, die makers, and other short run, discrete manufacturers. This is based on the ASSY1, ASSY2, or ASSY3. It brings together the JobShop module and Assembly Track in one place. (See the JobShop2 documentation for more information).
MBATCH	The Masterbatch manufacturing type is used to create items with a unit of measure based on a weight such as grams or pounds. The item produced is made up of several components which also must have a weight type unit of measure. ▪ Item details tab has icon to add components based on quantity or percentage instead of calling out for a primary material (similar to Compound1). ▪ Production Summary info for "Batches/Hr" and "Hours/K Batches". ▪ Cycle Time is called "Batch Time", Actual and Standard Cavitation is called "Act Batch Size" and "Std Batch Size", no Part Weight (See Masterbatch MFG Type for details).
OUTSOURCE	For Outsource operations. The Center Type is changed to "Vendor" and Cycle Time is changed to "Days/K" (days required to get 1000 parts), there are also fields for a "Flat Ratio" cycle time and "Drop Ship". There's no Tooling or Production Summary data. (See Outsourcing below for details).
PM	No BOM's are created for this MFG Type. It is used if you wish to set up PM Cells for using the PM Capacity Schedule tool. The PM MFG Type is only used in Maintenance, Repair and Overhaul. It will not be visible in BOMs, Work Centers, Scheduling, Production Reporting, and RealTime. (See the Maintenance, Repair and Overhaul help file for more information).

REWORK	Same as Generic BOM. Used in conjunction with creating RMA rework work orders for Rework type work centers. (See Mfg Rework Order for details).
RIM	Similar to an Injection BOM except Runner/Sprue is called "Flashing". The cycle time defaults to minutes and not seconds. Shift Backflush can only be "Based on total cycles at shot weight. The Eff Factor is called "Yield Factor", Production Summary also has a "Parts/Hr" value.
ROTATIONAL	Similar to Injection BOM except no Runner/Sprue field, and cycle time defaults to minutes and not seconds.
SFOAM	The same as Injection BOM, however in the Work Center module, the Center Type is changed to "Platen Type".
SLITTING	Used for slitting rolls of material to specific thicknesses. Similar to EXT1 as it has Feet/Lb and Lbs/Hr. (See Slitting for details).
STAMPING	Similar to Injection BOM except Runner/Sprue is changed to "Waste Material".
TFORM2	Fields for Gauge, SPG, Tool Width, Tool Length, Sheet Weight, and Skeleton Weight. Designed for inputting sheets that have native UOM of Each and are dispositioned in Each (includes additional fields for Rail and Clamp values).
THERMOFORM	Fields for Gauge, SPG, Tool Width, Tool Length, Sheet Weight, and Skeleton Weight. Designed for continuous feed input. (See Thermoform - General BOM Information for information on Thermoform and TForm2 MFG Types).
THERMOSET	Same as Injection BOM.
TREATMENT	This manufacturing type is used for processes such as heat treatment and annealing where multiple items are processed at one time. All items that require a specific Treatment are included in the BOM.

ASSY vs. Generic Comparison

MFG TYPE	WORK CENTERS	BOMS	PROCESS/ OPERATIONS	SCHEDULING	PROD/LABOR REPORTING
ASSY 1	Work Centers are associated to the processes	Processes are added to the BOM (required)	Process (required) contain Center Types, Materials, Cycle Times, Yield, Labor, etc.	Work Orders/ Processes are added to ASSY Track, and Finite Scheduling (optional)	ASSY Track, or ASSY Data; backflushing is done when Process is completed. FG item is added to inventory when Final Reporting is done.

ASSY 2	Work Centers are associated to the processes and Assembly Line	Processes are added to the BOM (required)	Process (required) contain Center Types, Materials, Cycle Times, Yield, Labor, etc.	Processes are scheduled on work centers in scheduling similar to ASSY1	ASSY Track, or ASSY Data; backflushing is done when Process is completed. FG item is added to inventory when Final Reporting is done.
ASSY 3	Work Centers are associated to the processes and Assembly Line	Processes are added to the BOM (required); Assembly Line is associated to the BOM	Process (required) contain Center Types, Materials, Cycle Times, Yield, Labor, etc.	Work orders are scheduled on work centers in Finite Scheduling	ASSY Track, or ASSY Data; Components are backflushed at Final Assembly by default. Optionally, components can be backflushed when reporting labor instead of at final assembly if the 'Backflush Each Process' option is checked for the MFG Type.
GENERIC	Work Centers Types are associated to the BOM	Required fields include center type, cycle time (seconds); optional fields scrap%, labor, and eff %	Operations are additional steps; can include cycle time and rate, and are optional	Work orders are scheduled on work centers in Finite Scheduling	Prod Rep by Shift / PRLS Prod Rep by WO PRA
ASSEMBLY	Work Centers Types are associated to the BOM	Required fields include center type, cycle time (hours); optional fields scrap%, labor, and eff %	Operations are additional steps; can include cycle time and rate, and are optional	Work orders are scheduled on work centers in Finite Scheduling	Prod Rep by Shift / PRLS Prod Rep by WO PRA

Generic & Assembly MFG Types	ASSY MFG Types
• 1 BOM = 1 Part #	• 1 BOM = 1 Part #
• 1 Work Order	• 1 Work Order
• 1 data point entry	• Each process is a data point entry
• Cost per BOM	• Cost per Process

Compound vs. Masterbatch

MFG TYPE	COMPOUND	MASTERBATCH

Cycles Based On / Cycle Time	Lbs/Hr	Batch Time in Secs
Item Details > Item Info	Item Weight > Lbs / Gr / Oz	Std Batch Sz / Act Batch Sz
Assign Batch Components	By Percentage / By Qty & % / Parts Per	By Percentage / By Qty & % / Parts Per
Production Reporting	Total Cycles X Batch Size = Good Parts (Lbs) + Reject (Lbs	Total Lbs = Good Lbs + Reject Lbs

Modify or Add MFG Types

To modify or to add additional manufacturing types, follow the steps below.

➢ From the EIQ Launcher Bar, click on **File|Manufacturing|Mfg Setup|Mfg Type.** The **Modify Manufacturing Types** screen will appear.

➢ Highlight the Mfg Type to modify and make the change.

➢ If adding in a new type, click on the **ADD [+]** function key located on the Navigator bar.

➢ From the Select Mfg Type form choose the Predefined or User Defined tab.

Predefined - This tab is used to add predefined manufacturing types available in the system. Select the drop down list and choose from the supported manufacturing types.

User Defined - This tab is used to create user defined manufacturing types. Enter the name in the Mfg Type field (apostrophes are not allowed) and select the manufacturing type the user defined type should default to from the drop down list of system supported manufacturing types. Once the manufacturing type is selected, the options on the right side of the MFG Types screen   will be updated based on the selected default type. To function properly the predefined type the user defined type is based on must be active in the MFG Type list for non ASSY types. When a user defined type ASSY manufacturing type is created without having the predefined ASSY type created, the system will still make the Assembly Track and Assembly Process Maintenance modules visible after logging back in.

Note: When naming multiple user defined manufacturing types, ensure that the names are unique in ways other than just special characters (for example, not "TYPE#NAME" and "TYPE/NAME").   This will ensure that the different types will be able to have their own User Defined Forms associated with them.

Notes:

Once BOMs are created using the user defined manufacturing type the default type cannot be changed. If BOMs have not been created and the user wants to change the 'default to' type, the user defined manufacturing type will need to be deleted and then recreated.

If a user does not select a 'Default To' MFG Type, it will default to Generic.

If a user attempts to create a user defined manufacturing type with the same name as a predefined manufacturing type a warning will appear stating, "This is a standard mfg type and is not available to utilize in a User Defined mfg type."

When naming multiple user defined manufacturing types, ensure that the names are unique in ways other than just special characters (for example, not "TYPE#NAME" and "TYPE/NAME").   This will ensure that the different types will be able to have their own User Defined Forms associated with them.

Reports Names Tab:

Assign the appropriate BOM and WO **reports** by clicking on the search button to right of these fields. The BOM and WO reports can be EPlant specific if desired. Select the EPlant ID and then select the report using the search button. When generating reports using speed buttons in the BOM or WO module, the report that prints will be based on the EPlant the user is logged into.

Labor/Overhead Tab:

Set the labor and overhead cost element associated with the manufacturing type.

➢ **Default Labor Rates** - Default Labor Rates may also be setup from within this screen as well. These rates can be overridden when setting up a manufacturing configuration by clicking on **Options|Misc. Parameters** from within the BOM screen or by utilizing the employee levels in the labor field of the BOM. Rates can be set for Current, Future, Budget, and Forecast. If these costs are populated, the system will use these instead of the current cost for calculating the applicable cost such as Future Cost.The same cost elements assigned to the center type will be used for these calculations.

➢ **Labor posted from Time & Attendance** - When checked the labor will not post to translog from floor dispositioning. Labor will be posted from Time & Attendance only. When floor dispositioning the system will not put an actual cost into the translog for labor for that manufacturing type.   It removes the actual labor entry from the floor disposition/backflush routine so that only actual labor is picked up in PIT from the Time and Attendance records. If it is not checked and labor is reported using Time and Attendance there will be a double hit to labor. Note: During production reporting the employee hours information can only be edited if the user has security rights to do so. A Status Exception will appear stating "Mfg Type is setup to have labor posted from Time & Attendance". By default, if users enter labor in production reporting it will post to translog, therefore Time and Attendance users should not enter labor in production reporting.

  ▪ **Include Manual Labor from PRS** - If the 'Labor posted from Time & Attendance' option is checked this option can also be checked to include manual labor information from Production Reports by Shift (PRS). If the 'Labor posted from Time & Attendance' option is not checked this option will be grayed out. When checked it allows users who do not have Time & Attendance setup for all EPlants to still report labor from PRS. This can also be checked at the MFG Cell level. When determining if manual labor should be included from PRS the system will look at the MFG Cell first using the hierarchy below:

If 'Include manual labor from PRS' is set as 'Yes' on the MFG Cell the system will include both manually entered labor and labor posted from Time & Attendance.

If the MFG Cell is set to 'N' the system will not include manual labor from PRS.

If this field is not set at the MFG Cell level the system will use what is set for the MFG Type.

Note: When 'Labor posted from Time & Attendance' is checked and 'Backflush on Clock Out' is also checked, when clocking out and reporting zero good parts, only Labor hours, the Actual Cost is updated to include the Actual labor dollars recorded for all labor reported.   This Actual Cost will be updated on the Location when parts are put in to inventory, and captured in IACJ.

Note: When the 'Labor posted from Time & Attendance' is enabled on the MFG Type and the 'Include Manual Labor from PRS' is not checked, if a user manually adds labor to the Employee Hrs on the Production Report, the user will need to close the production report and go to Task Clock Maintenance to post those manually added labor records before dispositioning the production report.

➢ **Use Labor Rate to calculate Actual Labor** - If this option is checked, when calculating actual labor in Actual Costing, instead of using the employee charge rate, the system will use the Mfg Type Labor Rate. The calculation is (Mfg type labor rate * Production Hours)/Quantity.

➢ **Variable Overhead** - The calculation for Variable Overhead can be *Work Center Based* or *Labor Based*. If 'Work Center Based' is selected, standard and actual overhead will be calculated as usual using the center rate. If 'Labor Based' is selected with a rate filled in then the standard and actual overhead costs will be based on the labor rate entered for the manufacturing type. If a rate is not filled in, the overhead will be 0. See Standard Cost Calculations - For Non Extrusion MFG Types in the Accounting manual for additional information.

➢ Variable Overhead generates its own IACJ file - its header references the Variable Overhead Translog record. Users can drill down in IACJ to view further details.

➢ **Fixed Overhead** - A Fixed Overhead Cost Element can be assigned to the MFG Type. When the Overhead is work center based the system will use the rates associated to the work centers. If the overhead is labor based, enter the rate in the Fixed field. **Note**: The Labor Based Rate Fixed rate is not currently used in an Engineering Quote calculation for Prod Cost.   The Variable rate can be used.

Fixed Overhead generates its own IACJ files - its header references the Fixed Overhead Translog record. Users can drill down in IACJ to view further details.

➢ **Overhead Posted from Time and Attendance** - This option is only available when the option 'Labor Posted from Time and Attendance' is checked and 'Work Center Based' is not checked. With this option enabled, an Overhead record is posted to the Translog (Transactions Log) along with the Labor record.

➢ The Total Calculated Hours are used for the Variable Overhead Quantity. If the Work Order is scheduled when the Labor record is posted, the Variable Overhead will post as the following:

➢ (Calculated Labor Hours) * (Variable Overhead Center Cost of the Work Center on which the Work Order is scheduled)

➢ If the Work Order is not scheduled when the Labor record is posted, the default rate currently set in the MFG Type -> Labor/Overhead -> Labor Based Rate -> Variable field will be used:

➢ (Calculated Labor Hours) * (MFG Type Labor Base Rate Variable Overhead Cost)

➢ This feature also applies to PRW (Production Reporting by Work Order). Since both the Labor and Overhead Translog records have the same batch and sub batch records, they are linked in Post Inventory Transactions (PIT). However, the Labor and Overhead records will not display in PRW when they are posted - they will only display in PIT.

➢ The following hierarchy will be used to capture Overhead cost elements.

  ▪ Cost Element on the Work Center assigned to the Labor record.

  ▪ If no Work Center is assigned to the Labor record, use the Cost Element on the Manufacturing Type.

  ▪ If no Cost Element is found on the Manufacturing Type, use the Overhead Cost Element(s) on the Item.

Note: When 'Labor posted from Time & Attendance' is checked and 'Backflush on Clock Out' is also checked, when clocking out and reporting zero good parts, only Labor hours, the Actual Cost is updated to include the Actual Overhead dollars recorded for all labor reported. This Actual Cost will be updated on the Location when parts are put in to inventory, and captured in IACJ.

Note: When 'Overhead Posted from Time and Attendance' is checked, variable overhead is still calculated and associated with the correct FG_MULTI record when a clock out occurs and 0 good parts are reported.

Note: When 'Overhead Posted from Time and Attendance' is checked, the FGMULTI_COGS also tracks labor and overhead posted from Time and Attendance, so the COGS amounts are still calculated correctly.

➢ Fixed Overhead records will post from Production Reporting and Floor Dispositions as they currently do:

➢ (Number of Parts) * (Fixed Overhead Posted from Time and Attendance)

➢ If an MFG type does not have 'Overhead Posted from Time and Attendance' checked and Task Clock Labor hours associated ot the MFG type are posted from Task Clock IN/OUT Maintenance, Variable Overhead will NOT post to Translog.

➢ If a floor disposition occurs involving an item associated with an MFG type that has both 'Labor Based Rate' and 'Overhead Posted from Time and Attendance' checked, the Variable Overhead will not post to Translog until the Labor record is also posted.

➢ If an item is associated with an MFG type that has both 'Labor Based Rate' and 'Overhead Posted from Time and Attendance' checked, the system does not use the value in the 'Production Hours' field for the Overhead calculation when the Production Report Line is dispositioned because the Variable Overhead record has not been posted to Translog yet. The Variable Overhead record will not be posted to Translog until the Labor record is posted.

➢ If 'Overhead Posted from Time and Attendance' is checked and Actual Costing is enabled, whenever Labor records are posted to Translog, Fixed Overhead records are also posted to Translog. The Fixed Overhead record in Translog will mimic the Variable Overhead record created in Translog whenever Backflush on Clock OUT occurs with Standard Costing enabled. The Fixed Overhead Actual Cost posts as the following:

➢ (Number of Parts) * (Fixed Overhead Cost of the Cost Element's Standard Cost)

Note: The Fixed Overhead cost is only the top level item's Fixed Overhead Cost - costs of components are not included in the calculation.

Note: The TA_LABOR table holds the Number of Parts records.

Note: The 'Overhead Posted from Time and Attendance' option is designed to use PRS (Production Reporting by Shift and PRW (Production Reporting by Work Order) modules as its reporting methods. Attempting to use other reporting methods may result in errors.

Note: Labor based overhead is not applicable to the Treatment MFG Type and will be grayed out so users will be unable to select this option.

General Tab:

➢ **Shift Backflush Rules** - This option is available for applicable Mfg Types (Injection, Blow Molding, Extrusion 1, Extrusion 2, Extrusion 3, Rotational, SFOAM, Stamping, and Thermoset). From this setting the user can establish the default Shift Backflush Rule for a Manufacturing Type. When creating new BOMs for a Mfg Type with a default Shift backflush Rule the system will assign the default rule automatically. The default Shift Backflush Rule is also used when converting a quote to BOM for the designated Mfg Type.

➢ **Backflush on Clock Out** - If this option is checked when the user clocks out of a task they will be prompted with the Floor Disposition screen. From the floor disposition screen the user can enter the quantity of parts produced while clocked in to the task. *Note*: This option requires RealTime to tie the floor disposition transactions to Production Reports. For Non RT users please see the "Non RT Backflush" option below.

➢ **Non RT Backflush** - If the Backflush on Clock Out option is checked the Non RT Backflush option becomes available. With both the Floor Dispo and the Non RT Backflush checked when the user clocks out of a task they will be prompted to disposition parts from the work order they clocked out of and backflush components. This backflush is not tied to the production report. The transactions are made in inventory and tied to the labor record.

➢ **Use Yield % on BOM** - If this box is checked the BOM 's associated to the MFG Type will say 'Yield %' instead of 'Scrap %'.

➢ **RT parts to go based on scans** - This option is available for all Mfg Types except ASSY1, ASSY2, ASSY3, Outsource and JobShop. If this is checked, a warning message will display, 'You must close and reopen the RTServer.exe for this to take effect'. Once RTServer is restarted RealTime monitoring parts to go count, as well as any other field calculated from Parts to Go, including Shift Parts and Total Parts will not be changed until an RF scan / floor disposition transaction is done. Cycles will accumulate, up time, downtime, etc will be monitored. Note: Rejects will not affect parts to go.

Note: For User Defined MFG Types this is a pass through feature from the default MFG Type. For example: If the standard Injection MFG Type is checked on RT Parts to Go is based on scans, then all UD MFG Types with the default as Injection will decrement by scans and not cycles.

➢ **Include scrap in By-Product weight calc** - This option only applies to the Thermoform MFG Type. With this option checked if scrap is added to the main form of the BOM, it will be included in the by-product weight on the item details tab.

- ➢ **Logical Work Center Support** - This option only applies to the Injection, Die Cast, Generic, Extrusion, Extrusion 2 and Extrusion 3 Manufacturing Types, or user defined types based on those MFG Types. This is designed to create logical work centers running multi-position mold frames. When this option is checked, on work centers, a tab called 'Change Over' appears. Please see the ***Logical Work Center https://my.iqms.com/cfs-file.ashx/__key/Technote/Logical_2D00_Work_2D00_Centers.pdf*** TechNote for more information.

- ➢ **Do not round up dependent demand** - With this checked the dependent demand will not be rounded up to the next whole number on dependent work orders. If this option is checked, the quantities will be calculated and displayed with full decimal precision to mirror the BOM Tree explosion. This setting also applies to the 'Explode Forecast' tool in the Forecast module. When exploding a Sales Analysis Forecast, the quantity for dependent demand will be rounded up to the nearest whole number unless this option is checked for the relevant Manufacturing Type. This applies to all MFG Types except MBATCH, JobShop, ASSY1/2/3, EXTRUSION2, SLITTING, COMPOUND1, and OUTSOURCE. Important Note: Any MFG Type that makes an item in EACH will round, regardless of this setting.

- ➢ **Std costing calc to consider family tool part weights** - This option only applies to the TFORM2 Mfg Type. When this is checked the standard cost calculation for TFORM2 items will take into account the part weight of each member of the family tool.   The calculation will be very similar to the standard cost calculation for the THERMOFORM Mfg Type.

- ➢ **Add Floor Disposition Out Qty to Calculated Usage** - This applies to all Mfg Types except ASSY 1, 2, and 3. If this is checked the out disposition quantity will be added to the calculated material usage during production reporting by shift. If it is not checked it will replace the calculated material usage in the production report. Note: This applies only if the work center has the 'Floor Actual Material Usage' option checked.

- ➢ **Use SN Labels to Control MTO Dispositions** - When this option is set to Yes, MTO releases will be combined on work orders rather than getting a work order for each release (including multiple customers/orders). All other allocation functions of MTO will remain the same, only bucketing is different. When printing labels, the Order # drop down will reflect the customer for that order on the label. This option can be set at the Manufacturing Type level, which will override the default setting in System Parameters->Purchase Order and Sales Order Setup tab. Choices in the drop down are System Default, Yes, and No. 'System Default' will look at the global setting. A selection of 'Yes' will enable the 'Use SN Labels to Control MTO Dispositions' functionality for the specific Manufacturing Type. If 'No' is selected the functionality will not apply to that particular Manufacturing type.

➢ **Auto Substitute BOM** - When this setting is enabled, when attempting to add a work order to the first position (in EIQ or ShopData), the system will look to see if the BOM on the work order is already scheduled in the first position on a logical work center. If the same BOM is already scheduled/running on a logical work center, and the user is trying to add it to a different logical work center then a substitute BOM will be created before adding the work order. A security enabled warning message will appear: "Attempting to schedule this work order on a different logical work center than the currently running BOM. What do you want to do?" The warning message that surfaces will give the user the option to 'Create a substitute BOM' or 'Do not create substitute BOM'. There is also a "Do not show again" check box. Note: This option is visible on all MFG Types but will not affect anything unless the MFG Type also has 'Logical Work Center Support' enabled.

➢ **Plug Value** - This is used for informational purposes only.

➢ **Disposition all Hard Allocated raw material when work order is marked "Prod Finished"** - This option can be set at the Manufacturing Type level so that when materials are backflushed for a work order that has been marked 'Prod Finished' either by selecting 'Workorder xxx is finished' when performing a setup in RealTime™ or Scheduling, or when it is manually checked in the production report, all hard allocated materials will be removed from inventory instead of the calculated required quantity. For example, if the quantity hard allocated is 1500 and the required quantity based on what was manufactured is 1250, the system would remove the 1500 when this is checked, if not checked it would remove 1250. If some required material was not hard allocated the system will calculate the material usage using the standard method, i.e. by evaluating total cycles and parts counted, etc.

➢ The system will look at the Work Center/Manufacturing Cell that the work order actually ran on when verifying whether or not the options are checked. This also applies to Non-RealTime Production Reporting by Shift (PRS). If a work center/Manufacturing Cell is selected that differs from the one the BOM has assigned, the Work Center/Manufacturing Cell in PRS will be used.

There are three options that can be selected from the drop down list: Yes, No, and System Default.

▪ Yes - When Yes is selected the option is enabled at the this level.
▪ No - When no is selected the option is not enabled at this level and the system will not continue looking at the hierarchy.
▪ System Default - By default it is set to 'System Default'. If system default is selected the system will evaluate the hierarchy.

A mouse-over hint is available when hovering on the setting that will let the user know which level of hierarchy will be used for both options (Disposition all Hard Allocated... and Freeze Consumption...), and what the values are. For example, "All hard allocated materials will be consumed. Consumption beyond hard allocated will not be frozen. Hierarchy Level = System".

The hierarchy for this option is:

1 Work Center

2 Manufacturing Cell

3 Manufacturing Type

4 Production Reporting by Shift Parameter

Note: This feature is available for all MFG types except ASSY2, ASSY3, and COMPLEX.

➢ **Freeze consumption beyond hard allocated** - This option will be available if the 'Disposition all Hard Allocated raw material when work order is marked "Prod Finished"' option is checked. If this option is enabled and 'Prod Finished' is checked for the work order, the system will not consume more material than what was hard allocated.

Note: When dispositioning the item the system will show material/components that were not hard allocated to the WO and only freeze consumption of material/components that were hard allocated but have been brought to zero through Return to Inventory or consumption.

General Tab for Assembly MFG Types (ASSY1, 2 and 3):

➢ **Process Certification** – (This only applies to ASSY1) Select the desired process certification from the drop down list. The Certified tab in Assembly Process Maintenance will adjust depending on the selection made here. There are two choices:

▪ Certified Jobs – (Default) - Users can specify job requirements for running the process. This will limit which employees can log into a specific process. Only those employees with an active certification level high enough for the specific job can log into the process.

▪ Certified Employees – With this option selected individual employees will be certified on a process rather than a job.

➢ **No Supervisor required for Final Assembly** – This option controls whether a supervisor is required to enter the Final Assembly in AssemblyData.

Note: The 'Process Certification' and 'No Supervisor Required for Final Assembly' settings will be determined by the default predefined ASSY MFG type for any user defined MFG Types based on the ASSY type.   The reason for this is the potential to have the same process linked to multiple BOM's.

➢ **Dispo IN and OUT Locations –** A disposition In and Out location can be entered here. Click on the ellipsis button and select a location from the pick list. The Mfg Type dispo designated locations will fit into the hierarchy after the Mfg Cell dispo designator locations for both IN and OUT locations. This option is also available on user defined MFG Types that are based on the ASSY Type.

➢ **Use Percent Complete Reporting** - (For ASSY1 and ASSY2 MFG Types) - If this option is checked, when reporting labor for an ASSY1/ASSY2 work order/process, a percentage can be reported against a process instead of entering a quantity.   In Assembly Track and JobShop, the Progress bar in the Process Details will display the last percent complete that was reported.   Material attached to the process being reported on will not be backflushed until Final Assembly Reporting.

- ➢ **Consume Raw Material by Process** - If the 'Use Percent Complete Reporting' option is selected this option is available. If this option is unchecked, in Assembly Track-> Labor Reporting, the Report Consumed Materials tab will be hidden. Material will be backflushed upon Final Assembly.   If this option is checked, in Assembly Track-> Labor Reporting, the Report Consumed Materials tab will be visible to enter a value of components to be backflushed. Upon Final Assembly the system will not backflush material.

- ➢ **Backflush Each Process** - (For ASSY3 only). If this option is checked, when clocking out of a process in AssemblyData or labor reporting in Assembly Track, the system will backflush the components.   When performing Final Assembly, it will not backflush the components. This allows users to be able to finite schedule a work order to an Assembly Line and still allow for backflushing at each process.

Note: If this option is not checked, the Processing Time on the BOM must be calculated using the Process Throughput Map button. If it is not calculated the system will have no way to know when material(s) are required so it will assume it will end on the last day.
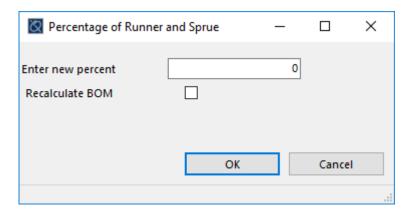

- ➢ **Launch Final Assembly Reporting on designated process** - If this is checked users can designate a single process in the Assembly BOM that will launch the "Final Assembly Reporting" form. The Assembly BOM can only have one process designated as "Final Assembly Reporting".

- ➢ **Use SN Labels to Control MTO Dispositions** - When this option is set to Yes, MTO releases will be combined on work orders rather than getting a work order for each release (including multiple customers/orders). All other allocation functions of MTO will remain the same, only bucketing is different. When printing labels, the Order # drop down will reflect the customer for that order on the label. This option can be set at the Manufacturing Type level, which will override the default setting in System Parameters->Purchase Order and Sales Order Setup tab. Choices in the drop down are System Default, Yes, and No. 'System Default' will look at the global setting. A selection of 'Yes' will enable the 'Use SN Labels to Control MTO Dispositions' functionality for the specific Manufacturing Type. If 'No' is selected the functionality will not apply to that particular Manufacturing type.

- ➢ **Auto Substitute BOM** - When this setting is enabled, when attempting to add a work order to the first position (in EIQ or ShopData), the system will look to see if the BOM on the work order is already scheduled in the first position on a logical work center. If the same BOM is already scheduled/running on a logical work center, and the user is trying to add it to a different logical work center then a substitute BOM will be created before adding the work order. A security enabled warning message will appear: "Attempting to schedule this work order on a different logical work center than the currently running BOM. What do you want to do?" The warning message that surfaces will give the user the option to 'Create a substitute BOM' or 'Do not create substitute BOM'. There is also a "Do not show again" check box. **Note:** This option is visible on all MFG Types but will not affect anything unless the MFG Type also has 'Logical Work Center Support' enabled.

- ➢ **Plug Value** - This is used for informational purposes only.

For more information on the ASSY MFG Types please refer to the ASSY Manufacturing documentation.

File Menu:

Alter Lbs/K Calculation - This option is only available to the Injection and Diecast MFG Types, and for Custom MFG Types that default to Injection and Diecast.   Injection and Diecast MFG Types can have a different percent. There can only be one % value for Injection and custom MFG Types like Injection, and the same is true for Diecast and MFG types like Diecast.

From the File menu select the 'Alter Lbs/K Calculation' option. A screen will appear for users to enter in a different percent of the runner and sprue to be used when calculating the Lbs/K for BOM's associated to the selected manufacturing type. This defaults to 0.

After entering a new percent the user can check the 'Recalculate all BOM' box to have the system recalculate the Lbs/K for all BOM's associated to the selected manufacturing type.

When users do not check the Recalculate BOM box, what is calculated depends on where the changes are made:

- When on a Diecast BOM and the user goes to Configure->Mfg Types, selects Diecast and changes the % but does not check Recalculate BOM. When they exit the form only the BOM they were on will recalculate.

- When on an Injection BOM and the user goes to Configure->Mfg Types, selects Diecast and changes the % but does not check Recalculate BOM.   When they exit the form no BOMs are recalculated.

- When on a Diecast BOM and the user accesses Mfg Types from the Launcher File menu or from Lists in System Parameters, when they change the % and do not check Recalculate BOM, when they exit Mfg Types and refresh the BOM form that BOM is recalculated but other Diecast BOMs are not.

- If the BOM form is not open and the user accesses Mfg Types from the Launcher File menu or from Lists in System Parameters, when they change the % and do not check Recalculate BOM, when they exit Mfg Types, no BOMs are updated.

Example Calculation:

The Alter Lbs/K value only applies when AA - AB < Cavity * Part Weight

AA is the Shot Weight, taking into account runner/sprue and scrap = (Cavity * Cavity Weight + Runner/Sprue) / Yield

AB is the Shot Weight * regrind percentage = AA * (Regrind / 100)

Example: Cavity * part weight is 12.05 and Regrind is 5%

AA = (1 * 12.05 + 12.05)/ .95

AA =   25.3684

AB = AA * (Regrind / 100)

AB = 25.3684 * .05

AB = 1.26842

AA - AB = 24.1

24.1   is not less than 12.05,   so with these numbers the Alter Lbs/K value is not used

If Regrind is 75%:

AB = 25.3684 * .75

AB = 19.0263

AA - AB = 6.3421

6.3421 is less than 12.05,   so with these numbers the Alter Lbs/K value is used.

Please see Calculations for LBS/K Cycles for more information.

User Defined Conversion Factor

Each MFG Type has default values for the basic calculations such as cycle time and shots per hour. This function allows the user to override the defaults and create user defined factors for a specific MFG Type. Select the ⬜ speed button to open the form to input the conversion information for the highlighted MFG Type. The form will be empty when first opened.

Select the speed button on this form to add all of the fields available for creating user defined conversions, or select the arrow down button next to the speed button to choose a single item.
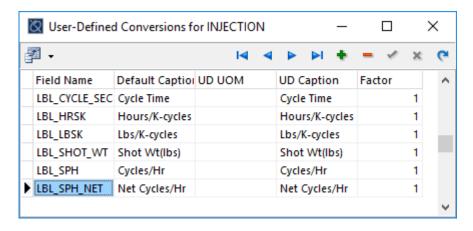
For each field selected the Default Caption will fill in automatically.

The user can change the caption and/or the unit of measure:

- **UD UOM** - To change the unit of measure, double-click in the UD UOM field and the following Define UOM form will appear:

Choose the desired unit of measure (Second, Minute, Hour, or Day) from the drop down list and select OK. The user defined caption will fill in automatically with the selected UOM but can be overridden. The Factor field is based on the UOM chosen and cannot be edited.

- **UD Caption** - To change the caption that appears on the BOM form for this MFG Type enter the information in the UD Caption field.

Creating a New BOM

The following information is specific to the Injection manufacturing type, however several MFG Types such as Die Cast, Rotational, RIM, and Stamping are very similar. The terminology used on the BOMs will be changed to apply to the specific manufacturing processes. Examples of other manufacturing types are available at the end of this section.

Minimum Requirements

Each manufacturing configuration must contain at least the following information. Be sure that this data is available prior to entry:

- Manufacturing Configuration Number (Mfg#)
- Cycle Time in seconds
- Work Center Type (normally the press tonnage this configuration should be scheduled on)
- Item number and Description (each standard allows unlimited items per configuration - family tools).
- Material designation

Optionally, the following information should be available:

- **Insert** information
- **Packaging** information
- **Operation** information
- **Instructions** detailing machine setup, manufacturing process, operation notes, quality control and auxiliary equipment.

Accuracy is Important

As you enter in the configurations, make sure the information is as correct and complete as possible. Accuracy is very important because all calculations and assumptions are based on this information.

Before You Begin

Prior to the entry of Manufacturing Configurations, be sure that all the basic information has been entered as outlined below:

- Customer Data
- Raw materials
- Inserts (purchased components)
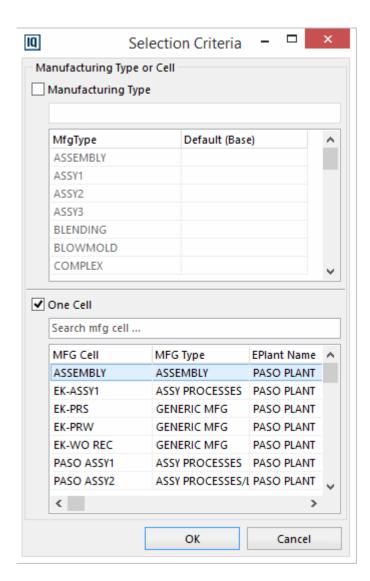- Packaging
- Work Centers
- Vendors

NOTE: The section following will outline the guidelines for creating a standard BOM for injection molding. To create Generic, Extrusion, or Outsource BOM's please see those sections later in the chapter.

Use the following information to understand the basic process of creating a new BOM. The Injection BOM is used as it illustrates the basic steps for all types of BOMs. Specific information concerning the Extrusion, Thermoform, Generic and Outsource BOM is available later in this chapter.

Many of the steps are similar regardless of BOM type, and they are described once in the following section. For example, adding components, packaging, documents and auxiliary equipment are all handled in an identical manner for all manufacturing types.

To create an injection BOM follow the steps below.

➢ From the **EIQ Launcher Bar,** click on the Mfg tab and select the *BOM button*. A pick list will be the first thing to appear even if no configurations exist in the database.

➢ Click on the [**New**] button located in the lower right hand corner of the pick list screen. From within the main BOM entry screen, you can also select the **ADD [+]** function key or click on **File|New Mfg Config** to perform the same operation.

➢ Upon selecting **New** (or Add), the following screen will appear:

> Select a **Manufacturing Type** and/or **Cell Type** using the scroll bars or enter information in the white space to hyperbrowse to the desired Manufacturing Type or Cell. Press [**OK**] or [**ENTER**].

NOTE: The MFG Types that are visible by default are determined during implementation of the software, however many manufacturing types are available and the user may add them to the list.

User defined MFG Types may be added by going to **Configure/Mfg Types** on the menu. If a user defined type is added it will display in red on the list and default to the calculations used by the Generic standards. User defined conversion factors may be created.

Manufacturing Cells are used to designate separate areas in your facility for a single MFG Type. Manufacturing Cells allow a logical grouping of work centers. Separate scheduling and production reporting is done for each cell. When creating a BOM only the work center types associated with the selected cell will be available. For more information on MFG Cells please see the Manufacturing Cells section.

General BOM Information

The main entry screen contains all of the standard information such as the customer, manufacturing type, cycle time, materials, and more. The example below displays an injection configuration, however the information applies to the majority of MFG Types, such as Diecast, Blow Molding, and Rotational molding. The main entry screen for creating an Extrusion, Thermoform, Generic, or Outsource standard is subtly different than the screen shown here and will be described later in this chapter.

Note: When a user creates a User Defined Form field and grants security to that UDF field, if the UDF field is deleted the security to the field is removed. If the UDF field is re-added with the same name, security will need to be reestablished for users.

Field Listings for Injection Standards

The following is a field listing for an injection configuration. When greater detail is required to describe how the information is entered it will be described below the corresponding field listing.
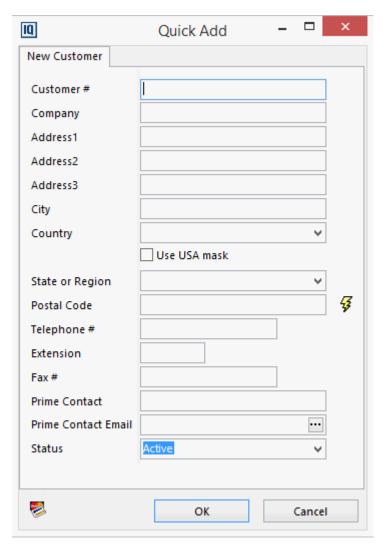
BOM/Standards Info

Mfg #	Up to 50 characters can be entered in this field. The number entered here is the number of the actual standard.
	Each configuration number and routing number combination must be unique. If the user enters a Mfg #/Routing Seq # combination that already exists, a prompt will be issued informing that a duplicate number was entered. The user will need to reenter a new Mfg or routing number.
	If the System Generated BOM # option is enabled in System Parameters->Sequential Numbering tab the Mfg # will be automatically populated with the next sequential number.
	Note: To view the STANDARD table ID for this BOM select the Alt F1 keys and a pop up will display the ID and the Table name. From the pop up users can right click to access copy, save, and print options.
Routing Seq #	This field can be used for informational purposes to define the routing step sequence of the BOM when there are several steps, or it can be used to differentiate between a BOM with the same Mfg #. This field and the Mfg # field are what makes a configuration unique. This field displays in the BOM pick list.
Description	The description of the BOM. This is optional but can be used to describe the BOM for reference.
	Hint: When using the same Mfg # but different routing seq #'s be sure to enter a unique description in order to differentiate between BOMs on the Manufacturing tab in Inventory.
Customer	This field is not required but BOM's should have a default customer attached. For proprietary parts, attach your company as the customer.
	See the information below for more details.

Select a **Customer** from the drop down list or the pick list. From the drop down list begin typing the customer's name and the system will hyperbrowse to the customer. If the customer does not exist in the hyperbrowse list, use the pick list located next to the Customer field and click on [**New**] to create the customer. Please see the section below on creating a customer on-the-fly.

Creating a New Customer

If a customer does not exist in the pick list or hyperbrowse list, one may be created by selecting the "New" button within the pick list. The following Quick Add screen will appear:

➢ Enter the basic customer information such as company name, address, telephone, and contact. The status will default to Active, but can be changed by selecting a different option from the list. Note: The user must enter or select a Country first before the State drop-down list is populated.   Once the information has been entered press [**OK**]. You will be returned to the main BOM entry screen.

➢ Once an existing customer or new customer is associated to the BOM, the user may right click on the Customer field and select **Customer Docs** to view or add any internal documentation associated with the customer, or you can also jump to **Customer Maintenance.**

Note: A record will be created in the Customer Maintenance module for this customer automatically. If you create a customer on the fly, you will need to go in and enter additional information (i.e. credit/sales, bill to, etc.) in the Customer Maintenance module. Creating a customer using this form supports only basic information.

From RFQ #	The information displayed here originates from the Quote module and will only be present if the standard was converted from a Quote. When a value is present the user can right click and jump to the quote. The quote the system will jump to is based on the quote ID associated to the standard.
	To change the quote the BOM is linked to, right click and select '**Edit RFQ Jump**'. A pick list of quotes that exist for the same item number will appear to choose from.
BOM Control #	The field consists of today's date, time and **EnterpriseIQ** user ID of the person who made the change.
	The BOM Control number will change automatically when someone makes a change to the configuration. This field cannot be edited.
	Note: Changing the Lot Number will not update the BOM Control Number.
	Note: The format of the Control # can be set in System Parameters->Company File Information->Application tab. If this field is blank it will default to MM-DD-RRRR-HH24:MI:SS (e.g. Username 03-16-2010-16:56:35). The user name is always the prefix.
	The format must start with a dash (-) . But the order of the the 'RRRR', 'MM', 'DD', HH24, MI or SS can be changed.
First Article Date	Enter in the **First Article Date** using the drop down calendar (Optional). This is the date that the configuration was first approved for use in a production run. This field is for information purposes only.
	This field description can also be changed by right clicking on the field and selecting the Define Label Text option. Enter in a user defined caption in the New Value field. The customized caption is based on Manufacturing Type. If the caption is changed for an Injection BOM, all of the Injection BOM's will have that same caption but not other types of BOM's such as Generic.
	Security can be placed on this field.
Schedule Information	The user can enter up to 250 characters of information that will display when a work order is scheduled to a work center that uses this BOM. A pop up form will appear with the note and includes a Cancel and OK button. If the user selects Cancel the job will not be added to the schedule. This note also displays on the Move Job form when moving the job between work centers, and is visible on the Unscheduled tab in the Scheduling Pool window. Security can be placed on this field (security item wwDBComboDlgInfo_Sched).
	The information can be printed using the Print button from the BOM or from the schedule.
EPlant Name	If you are using EnterpriseIQ's EPlant module the EPlant you are logged into will populate the EPlant field automatically. It is not a required field if EPlant is not being used.
	To manually select the EPlant associated with the BOM click on the 'Assign Plant' button near the field. Select the EPlant from the drop down list in the One Plant field. Select the 'Apply' button to update the field and automatically post it. If the 'OK' button is selected the change is made, but requires a manual post by the user.

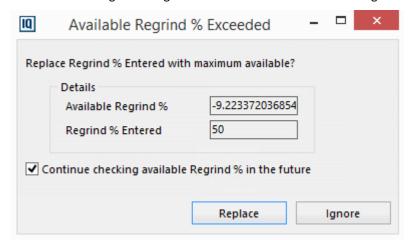|	
Inactive	A BOM can be marked inactive. This will 'hide' the BOM from pick lists. To view an inactive BOM the pick lists have a new button in the upper right corner to 'view inactive' items.
	Note: An inventory item with an inactive BOM attached will be considered a purchased item.
	Note: When a BOM is marked Inactive with a Split Mfg Percentage populated in Inventory, user get a confirmation message "MFG# XXXXXXXX will be removed from Item # XXXXXX Manufacturing Load Split Percentage Calculation" with an "OK" button to continue. This removes the BOM from the grid of Split Manufacturing Load for the Inventory item. This message will not appear if the BOM has a value in the threshold field.

Material/Regrind Section

Material Spec.	Enter the material that will be used for this job. This section has two fields--one will list the material item number and the other will fill in with the description.
	This is not a required field.
	To add the material, type in the first few characters of the material in the hyperbrowse list or select a **material** from the pick list near this field. Only primary materials will make up this list. If a material does not exist in the pick list, click on NEW to create the new material item. A blend may also be created by following this step. For more information on defining a blend, please see the section on Defining a New Blend Operation.
	The user can "Jump to Inventory" by right clicking on the description field.
EPlant	EPlant associated with material. This will fill in automatically.
Runner/Sprue	If this mold has a hot-runner system, the weight is zero. Most other types of molds will produce a sprue and/or runner that must be weighed. This information entered in this field is used to calculate how much material will be required and how much regrind will be produced. The UOM can be in grams, pounds or ounces.
	If the UOM is set to GR in the **Quote** module under **Misc/Rates and Parameters**, the system will use that for the BOM UOM regardless of whether the System Parameter setting is Metric or Imperial. If this UOM is set to null or any other value except GR the system will go to the System Parameters->Regional tab or EPlant Parameters (Enterprise->Miscellaneous tab) to determine whether to use the Metric or Imperial UOM. The UOM can be manually changed in the UOM field on the BOM.
	NOTE: Generated material requirements are based on the total CYCLE shot weight which includes all cavities and the runner and sprue.
	(This field is called Runner/Biscuit for the Diecast manufacturing type BOM, Waste Material for the Stamping manufacturing type, and Parison/Flash for Blow Molding).

Allowable Regrind%	This field is used to enter the amount of allowable regrind that can be used for this job. **EnterpriseIQ** will assume regrind consumption up to this amount, if the job will generate that much. This field is used in the calculation for raw material requirements only, and is related to the Disposition Regrind option below. The user can choose to have the system check if the amount of regrind is available while the Lbs/K calculation is done. This switch is available under **Options/Miscellaneous Parameters**. If this is selected, when the program calculates the lbs/K, the calculation checks to see available regrind (100*Runner wt/Shot weight) and will give a warning if the allowable regrind entered exceeds the calculated available regrind. If the allowable regrind % is greater than the available the following warning box will appear: The user can choose to **Replace** the Allowable Regrind % with the calculated amount or **Ignore** the warning.

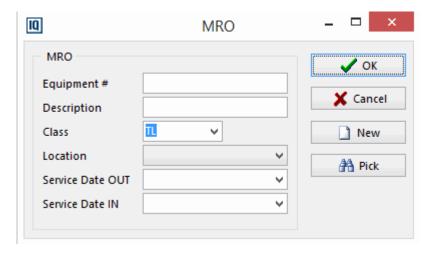|	
Shift Backflush	This field determines how the material will be dispositioned (backflushed) at the time of production reporting. If the MFG Type associated to the BOM has a default 'Shift Backflush Rule' (MFG Types->General tab) the system will assign the default rule automatically. It can be overridden by selecting a different option. To access the screen click on the ⬜ Edit Shift Backflush Parameters button. There are three options: **Total Cycles at Shot Weight** - This is the default method. The system will calculate total cycles at total shot weight for the raw material usage. **Total Cycles at Part Weight** - If this option is checked the system will calculate the total cycles at part weight. The runner and sprue are not included in the calculation for raw material usage. **Good Parts Only at Part Weight** - If this option is checked the system will calculate the good parts only at part weight for the raw material usage. It assumes that all scrap, and the runner and sprue have been ground up and reused at the machine. In effect, this reduces the amount of virgin that should be removed from inventory. **Regrind Option**: If the user selects this option, the program will backflush from the regrind on hand based on the amount entered in the Allow Regrind% field. During dispositions, the program will reduce the amount of virgin material used by the quantity of regrind. This question has NO EFFECT on the total amount of material used. **Example 1**: Leave the box un-checked: During dispositioning, the program calculates that you used 100lbs of material. 100 lbs of virgin material and 0 lbs of regrind will be relieved from inventory. **Example 2**: Check the box: During dispositioning, the program calculates that you used 100 lbs of material. At 20% regrind, 80 lbs of virgin material and 20 lbs of regrind will be relieved from inventory. If you have no regrind in the inventory file, the regrind amount will go negative.

Tool Information Section

Equipment #	The Tool equipment field is used to link a specific tool or tools which are used to run the configuration. The tool becomes equipment which can be tracked in the Maintenance, Repair and Overhaul module. Cycles for all tools associated with the BOM will be updated in Maintenance, Repair and Overhaul when a line item on a production report is dispositioned.
Location	This is the location of the tool. Select a location from the master location pick list.
Primary	Mark the tool that will be primarily used to run the configuration. Only one tool can be marked primary. This is the tool that will display in Scheduling and RealTime.
Service Date IN and OUT	These two fields show when the tool is out of service and when it will be back in service. See below for more information.

Multiple Tools may be linked to a configuration. Only one tool can be marked as the primary tool which will be the tool displayed in RealTime and Scheduling. However, all tools associated with the BOM will have the Total Units field updated in Maintenance, Repair and Overhaul when cycles are recorded on an archived production report.
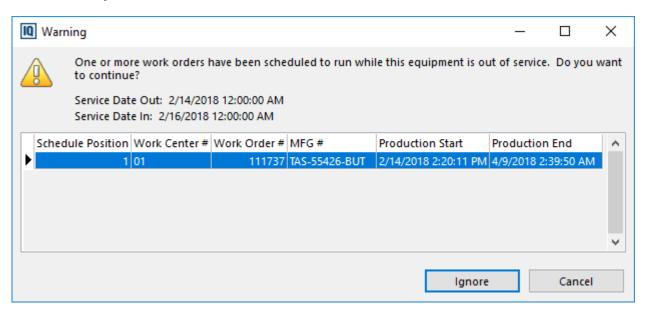
To link a tool to the configuration, click on insert record (+) button then click on the ellipsis button in the Equipment # field to bring up the following form:

➢ The user can either select an existing tool from the equipment pick list or create a new tool.

▪ **To pick an existing tool**: Select the **Class** from the drop down list. This list will include all classes of equipment including user defined classes. Once a class is selected the pick list will be filtered based on that class. Select the **Pick** button and then select the Equipment from the filtered pick list.

▪ **Creating a new tool**: To create a new tool enter up to 25 characters in Equipment # field. Enter a Description and select a Class from the arrow down menu near this field.

In both cases the following fields may also be filled in:

➢ Optionally enter a **Location** for this item using the drop down list of master locations. Most equipment may have a location code such as a rack number, or a floor position that specifies where they are supposed to be stored or returned.

➢ The **Service Date OUT and IN** fields are used to designate when the tool is out of service and when it will be back in service. A warning will pop up when the 'Service Out' date entered for the tool is before or during scheduled jobs using that equipment.   The warning screen displays the work center, MFG#, and work order information, with a right click Jump to Schedule available. Depending on security the user can choose Ignore or Cancel.   The same warning pops up if a 'Back in Service' date is entered in which the date range conflicts with scheduled jobs.

- ➢ If the dates do not conflict with scheduled work orders or the ignore option is selected this will show up in the tool number field on the schedule after update schedule is run when the Out of Service date for the tool is before or during the start/end dates for the job in scheduling. This applies to all tools associated to the BOM, not just the one marked as the primary.The tool number on the line item associated with the out of service tool will be yellow and show the date the tool is out of service.

- ➢ When adding an item to a sales order, if the tool associated to the item's default BOM is currently out of service, a pop up message will display stating, 'The tool is currently out of service.   Continue?' Users can select Yes to continue adding the item to the sales order, or No to not add the item. There is also a 'Do not show next time' check box which can be checked so that this message will not appear. Security can be placed on this form.

Continue this process until all tools which run this configuration are linked to the BOM. Be sure to check the **Primary** box for the primary tool.

Jump To MRO

Once tool information is added the user can jump to Maintenance, Repair and Overhaul for the highlighted Tool Eq # by right clicking in the Tool Info area.
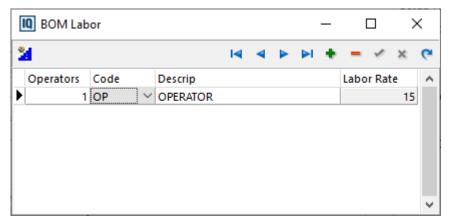
BOM Manufacturing Details Section

Mfg. Type	This field shows the TYPE of manufacturing associated with this standard.
Cell	Manufacturing Cells are associated to specific MFG Types and are used to designate separate areas in your facility. Manufacturing Cells allow a logical grouping of work centers. Group work centers by location, product line, process, etc… for separate scheduling and production reporting.
	Upon creation or modification of a BOM, if the Center Type does not match the Cell a pop up warning will appear stating, 'Selected center type does not match mfg cell - continue?' Select Yes to make the change or No to return to the BOM with no changes. Security can be placed on the Yes button and the 'Do not show next time' check box.
	Cells are discussed in the Setup Manual under **Manufacturing Cells**. Refer to that section for more information.
Center Type	**Required Field.** The entry here is based on the Center Type field in the Work Center module. Select the Center Type from the alphabetized drop down list or the pick list.
	This field links the job to a particular type of work center, though it does not necessarily link it to any one specific work center. Conceptually, **EnterpriseIQ** needs to know what kind of work center is used in the production of the item. It does not need to know specifically which work center. Assigning a specific work center is done during scheduling, where the user will have many options when placing the job in a particular work center queue.
	When attaching a Type to a configuration, the required type should always be entered as the smallest work center size in which this configuration would run. As an example, a job that runs in a 100 ton machine may also be able to run in a larger machine, but probably not in a smaller machine.
	The machine scheduling portion of **EnterpriseIQ** will group production jobs together according to the type, though the user can override this behavior.

Cycle Time	**Required data**. This field is the time, measured in seconds, from the start of one shot to the start of the next shot. **EnterpriseIQ** will convert cycle time in seconds to shots per hour on all production reports. Seconds per cycle can be calculated from parts per hour by this simple equation. Divide parts per hour by the number of cavities in the tool, then divide 3600 by that number to achieve cycles in seconds. Conversely, shots per hour is calculated by dividing 3600 by the seconds per cycle. **NOTES**: ▪ The system will not allow users to enter a cycle time that will end up being 0 (ex: cycle time = 0.0000278) because of the rounding to 4 decimal places. ▪ For the **RIM** and **Rotational** MFG Types the cycle time defaults to minutes. ▪ The unit of measure for cycle times for specific MFG Types can be changed. Please see User Defined Conversion Factor in the Modifying Manufacturing Types section for more information.
SetUp Hours 1	This is the typical time in hours required to set up the tool. Use a close estimate, but remember that it could vary from time to time based on the previous job. The schedule will add this amount of time to each work order, or bucket, for this configuration. This field can also be used to determine the set up cost portion for a manufactured item. Setup Labor can be broken out on the standard cost of a manufactured item. This option must be turned on in system parameters (**Sys Setup->System Parameters->Inv Setup tab**). When activated, the user can add a cost element and type to an employee level. There are two supported types: Setup and Production. When the standard cost is calculated the system will check to see if this option is on and if so will break out the labor costs to the cost elements attached to any employee levels on the BOM. For "Production" types, the calculation will remain as is. For "Setup" types, the system will look at the number of setup hours 1 on the BOM times the number of operators for that type times the rate for the employee level divided by the standard run qty. Please see the Standard Cost section for more information.
SetUp Hours 2	This field is used in the schedule when the same tool is running consecutively in a machine instead of Setup Hours 1. If the same tool is running back to back in a work center the Setup Hours 2 value will be used instead of Setup Hours 1. For example, this value can be set to zero and if the same tool will be running back to back the schedule will not add the set up time to the schedule which will provide a more accurate end time for the job.
Eff. Factor	This field will automatically populate from the default Efficiency Factor field in Miscellaneous Parameters (BOM->Option menu) when creating new BOM's but can be overridden for an individual BOM. This field is used to help **EnterpriseIQ** plan for an *assumed* production time. Entries made here will effect the Net Cycles/Hr and Hours/K fields in the Production Summary. **EnterpriseIQ** uses the Net cycles per hour to determine the length of a production run.
Scrap% or **Yield %**	Depending on the setting for the MFG Type ('Use Yield % on BOM' on the General tab in MFG Types) this will display as Scrap % or Yield %. Scrap % - This is the estimated amount of scrap that the process itself will generate. This is used in calculating the extra production time and material needed to complete the run. It is used on the Lbs/K calculation for raw material. Adding a scrap rate will affect the effective cycles per hour. Because each configuration can have it's own scrap rate, you should not include any other anticipated scrap usage here. Yield % - The estimated % of good product yielded during the operation.

Labor	This is the labor required at the work center to run this operation. This field is used to compute the labor hours required to complete the work order.
	To enter the required labor click on the ellipsis button in the labor field and the following form will appear:
	From this screen click on the **ADD (+)** button, enter in the quantity of operators required (this does not have to be a whole number) then select the Employee Level Code from the drop down list. The Labor Rate will fill in with the rate associated with the code. (Note: Security can be placed on the Labor Rate field so that it is hidden from the user in the BOM and the Work Order).
	The user can select multiple labor codes and associate fractions of operators per code or multiple operators per code.
	EnterpriseIQ supports a range of 0.00 to 999 operators per job. A number less than 1 can be used for jobs running automatically and an operator is not always at the press. For these tools, a partial number such as 0.5 is entered depending upon the number of machines the operator is tending.
	The Employee Levels list is created in Sys Setup->System Parameters->Lists. An unlimited number of employee levels may be created for use in the BOM and RFQ modules. The system comes with a Default labor code.
	If the Default labor code is selected the system will use the labor rate associated with the specific BOM (BOM->Options->Misc Parameters->Labor tab). If that is blank it will use the labor associated with the Manufacturing Cell. If the cell does not have a labor rate associated with it the system will use the labor rate associated with the Manufacturing Type.
	Users can access the Employee Level list to add or edit the records by clicking the icon in the top left corner of the form . (Security is available on this button).

UOM	The Unit of Measure of the runner and sprue and the part weight. The default UOM is set in the **Engineering Quote** module under **Miscellaneous->Rates and Parameters.**
	The UOM will be converted to the nearest Imperial/Metric version of the UOM depending on the setting in System Parameters->Regional tab or EPlant Parameters (Enterprise->Miscellaneous tab) for Imperial or Metric UOM.

Quote Parameters	Metric	Imperial
GR	GR	GR
LBS	KG	LBS
OZ	GR	OZ
KG	KG	LBS
FT	M	FT
IN	CM	IN
CM	CM	IN
M	M	FT
YD	M	YD
KM	KM	FT

	To change the default, click on the arrow near this field and select whether it will be in grams, pounds or ounces. Be sure to click on the 'Convert To' button in order for the weights to convert accurately. If the 'Save As' button is used the weight entered is not converted but simply saved as the new UOM as the weight entered. If the UOM field is changed it affects the units of measurement for this BOM only.
FG Lot #	This selection allows the user to assign a Finished Goods lot number to the configuration. For additional information on this field, please see the Finished Goods Lot Number section below.

Max WO Batch Size	Enter the maximum work order batch size if desired. This will break up the sales order releases into multiple buckets if necessary on the work order(s). For example: The sales order release is 2000 pieces, and the Max WO Batch is 500. Assuming zero on hand the system will create four work orders for 500 pieces each. For family items on order, a separate work order is created for the max quantity of each item. The Must Start dates on multiple work orders created from a BOM with a setting for Max WO Batch Size are incremented based on the estimated production time. The system starts with the original must ship date and backs up in groups based on the batch size. The difference is put into the last record. The must start is the must ship of the preceding record. This guarantees it will finish exactly on the requested must ship date. **Note**: Work order creation also takes into account the Mfg Min Qty inventory setting when used in conjunction with Max WO Batch Size on the BOM. **Note:** Similar to the Inventory setting MFG Min Quantity, entering a value in this field will create a separate work order for each release quantity. **Note**: If a manual work order is created with a quantity greater than the Max WO Batch Size, or if a planned work order is firmed and then the quantity is changed to be greater then the Max WO Batch Size a status exception will appear stating 'Max WO Batch Size Exceeded'. It will include the WO #, BOM#, WO quantity and Max WO Batch Size. The form includes OK and Cancel buttons. Security can be placed on the OK button. For family tools, if any item exceeds the BOM Max WO Batch size, the status exception will surface.
Assy @ Mach	This option should only be checked when setting up an assembly at the press configuration, where you need more than one produced part to make the final assembly. For example, if it takes two cycles to make enough parts to create the actual part number, click this option.This changes the terminology on the Item Detail page from Cavities to Multiplier. For example, the multiplier can be set to.5 of a part. This means that only half of the part is made each cycle. With this knowledge, EnterpriseIQ understands that it will take 1000 cycles to make 500 parts. The weight entered should be the total weight of the items assembled. In the above example the weight should the weight of the two items together (i.e. doubled).

Right Click Options:

From the General BOM tab users can right click and select:

- Trace BOM - This opens the Trace form to view changes made to fields setup in Trace for the Standard table.

- Jump to Process Monitoring Mfg # Setup - For users with a license for RT Process Monitoring, this option will jump to the Process Monitoring Mfg # Set up module with the current BOM highlighted. For more information see the *RT Process Monitoring TechNote https://my.iqms.com/cfs-file.ashx/__key/Technote/RealTime_2221_-Process-Monitoring.pdf*.

- Jump to Sales Configuration Template - When this option is selected, if the BOM is only associated to one sales config template, that sales configuration template will open. If the BOM is associated to multiple sales configuration templates, a pick list of templates will display to choose from.

Finished Goods Lot Number

A single Finished Goods lot number can be used to trace all raw material lot numbers associated with the production of the finished good. The FG Lot number is stored with the item during production. Any raw material lot number of any items consumed during the creation of the part is automatically linked to the FG lot number.

FG Lot numbers can be maintained within the BOM. They can be manually set here, or from the RealTime system.

In addition parameters can be set in Scheduling to automatically increment the Lot number or use the work order # at Setup for work orders on work centers that are connected to RealTime (see Increment Lot # at Setup and Use WO# as Lot # in the Scheduling Parameters section for more information).

This section describes how to create and maintain the FG Lot number.

To CREATE a new FG Lot #:

➢ Click on the **Set Next FG Lot #** icon.

➢ From this screen, select **Next Lot #.**

▪ **Next Lot #** simply tells the system to apply the next lot number to this item. The next lot number is the next sequential lot number maintained by the system. Note: With 'Use WO as Lot#' checked, if the user wants to change the lot number using the 'Next Lot#' button on the 'Set FG Lot#' screen, the specific MFG Lot# increments unless the 'Retain Assigned Lot# for this Work Order' is checked for the firmed WO.

▪ **General** - This field shows the last number used when Next Lot # was selected for any item.

NOTE: Alpha characters **cannot** be used in the Lot Number field if you are going to use the auto-increment feature.

▪ **User Defined** -The user can also choose to type the lot number in the field rather than use the system generated lot number.

▪ **Assign user defined lot # expression** - This option allows the user to build a lot number from a SQL expression. Select the 'Set FG Lot #' button to access this option. Up to 4000 characters may be entered in the pop up form. Example expression:

select

NVL(rtrim(substr(misc.get_eplant_name, 1, 1)), ' ') ||

substr(to_char(sysdate, 'YYYY'), -2) ||

to_char(sysdate, 'MM') ||

LPad(fg_lotno, 5, '0')

from params

The **Work Order ID** can be used as a parameter. Here is a sample SQL:

select mfgno || '_' || :workorder_id

   from standard

where id = :standard_id

The FG lotno generated in this example is mfgno+workorder_id.   If the Lot # is generated from the BOM, the result is mfgno+0.   Elsewhere, where the workorder_id is known the result is mfgno+workorder_id.

Notes:

▪ If the workorder_id is included as a parameter in the user defined lot # expression, when the FG lot # is generated from a form that does not know the workorder_id, be aware that the FG Lot # will be 0, unless the SQL is written to include what to do when workorder_id is null.

▪ 'Increment/Change Lot # at Setup' must be checked in Scheduling Parameters for this to work on setup.

▪ If 'Use WO# as Lot #' is checked the SQL expression does not kick in.

- The FG Lot# field is 25 characters long. Using a sql statement to create the lot # may generate a lot # that goes over the character limit.

When setting up a work order in the first position or adding a work order to a work center when there are no jobs currently scheduled, if the user defined expression is invalid users will receive a general SQL error stating, "While evaluating user assigned Lot # expression the following error occurred:...invalid SQL statement...".

Ensure unique lot # per item - When this option is checked the system will assign a unique lot number for each item in a family tool. If the Scheduling Parameter's option to have the work order number be the lot number is checked, the system will use the work order number as the prefix for all items, but it will add a dash and a unique number for each item in the family configuration. If the work order is not being used as the lot number, the system will use the lot number associated to the BOM with a dash and a unique number following. This also applies when printing labels from RF/WMS.

Exp. Date - If the item has the 'Expiration Date is Mandatory' option checked (Inventory->Additional tab) this field will be visible. For a new lot number a date must be entered or the user will get an error. Select the date from the drop down calendar.

Using the Lot Number

During production reporting, the finished good lot number follows the parts through to dispositions. At this point, the FG lot number is written to the Translog in the same record as the raw material lot number.

This relationship allows the system to find any particular FG lot number and all other raw materials associated with the run

When the option to maintain lot numbers from the BOM is used, that lot number will apply to all future production runs for this configuration until changed. The user must manually change the lot number from the standard or within the RealTime monitoring system screens.

When changing the FG lot number to account for the next FG lot run, the system will automatically increment the lot number if **Next Lot #** is selected, or the user may enter their own Lot # by selecting **Set Lot #**. The system does not check for duplicates.

Note: The BOM Control Number will not change if the lot number is changed through the BOM, RealTime, or Work Orders.

Note: From the Work Order module - FG Lot # field - If the work order is marked Firm an additional check box will display on the Set FG Lot # form, 'Retain Assigned Lot # for this Work Order'. When this option is checked the system will populate the FG Lot # in the Work Order table (WORKORDER.FG_LOTNO), and the lot number that is assigned will not be changed by the system later with the work order number if the global Scheduling Parameter 'Use WO # as Lot #' is checked.

Production Summary

Cycle/Hr	Basic calculation based on the standard cycle time, and how many cycles will occur in one hour. Example: Assume 45 second cycle time 3600/45 = 80 Cycles per Hour
Net Cycles/Hr.	The total number of *assumed* or *net* cycles that will be generated in an hour. This field is calculated by taking the number of seconds in an hour and dividing it by the cycle time, and then factoring in the scrap rate and the efficiency factor. This is the value used by the Work Order system to generate the total length of time required to manufacture the part(s). **Example**: (3600 / (cycle Time))(1-Scrap Rate percentage)(Efficiency Factor) = Net Cycles/Hr. Assume Cycle Time = 45 seconds Scrap rate = 4 Efficiency Factor = 100 (3600/45) * .96 * 1 = 76.8 Net Cycles per hour If the Efficiency factor was set to 90, then the Net Cycles per Hr = (3600/45) * .96 * .9 = 69.12
Shot Wt. (Lbs)	Shot Weight automatically calculates after you have entered in the manufacturing details. This field estimates the total amount of weight that the molding process itself will consume each cycle. This value is used in material planning, so accuracy is critical. If the UOM is in grams the calculation is as follows: (Cavity weight x # of cavities) + Runner & Sprue / 453.6 = Shot Weight in pounds.
Hours/K Cycles	This value displays the number of hours required to complete 1000 cycles. It is based on the Cycles/Hr. Assume 80 cycles per hour Hours/K = 1000/ Cycles per hour You can use this basic value to determine how many hours it takes to make one thousand parts by including the number of cavities for a part number. For example, if we assume the tool has two cavities, then: 1000/80 / 2 = 6.25 Hours. This is how many hours it would take to produce a thousand parts. Hours/K Cycles does not show the number of hours to make a 1000 parts, because of family tooling issues. For example, a tool with several of one part number and one of another would not be easily represented in a single value.
Lbs/K Cycles	The number of pounds of material that it takes to complete 1000 cycles. Determined by Shot Weight times 1000. Edit the part weight, runner and sprue and scrap to modify this value. The information in the Calculations for LBS/K Cycles section describes the Lbs/K calculation.

These values are based on the parameters entered earlier. The Shot Wt. and Lbs/K Cycles values are dependent on the part weights. Changing any of the parameters, then saving the changes will force the system to recalculate and re-display the new results.

Calculations for LBS/K Cycles

The Lbs/K Cycles calculation contains adjustments for regrind use.

The system will calculate the AA and AB values below to determine which formula to use for the LBS/K calculation. To find Lbs/K Cycles, the regrind percentage must be evaluated.

AA (Shot Weight, taking into account runner/sprue and scrap)	= (Cav. x Cav. Weight + Runner/Sprue) / Yield
AB (Shot Weight x regrind percentage)	= AA x (Regrind / 100)
BB (Shot Weight when Regrind is considered) This is used to determine the LBS/K when there is regrind on the BOM	See below for calculation examples. The calculation used depends on if the process will produce enough regrind. If the process will not produce enough regrind: BB = (Cav x Part Weight) + (Sprue x defined percent of runner and sprue*) If the process will produce enough regrind: BB = AA - AB

Use the chart below for the values used in the LBS/K calculation examples:

Cavities	= 1
Cavity Weight	= 3 gr. (Please note, if you have a tool with more than one part attached, each part will be summed individually).
Runner & Sprue	= 12 gr.
Scrap%	= 5%
Yield	= (100 - Scrap) / 100
Regrind%	Two examples below: One using 25%, and one using 85%

Given the above values:

AA = (1 x 3 + 12)/(100-5)/100

$\qquad$ AA = 15/.95

$\qquad$ AA = 15.7895

AB = 15.7895 x .25

   AB = 3.947

If Regrind = 0% then the following formula would apply:

Shot Weight in grams x 1000 cycles / 453.6 (converts grams to lbs) or:

((Cav. x Cav. Weight) + Runner & Sprue) / Yield x 1000 cycles / 453.6

Using the above values, then:

   AA x 1000 / 453.6

   15.7895 x 1000 / 453.6

Lbs/K Cycles = 34.81

If Regrind is >0%

If Regrind is >0% then one of the following formulas would apply depending on whether the process will produce enough regrind. The system does a comparison of shot weight less the shot weight times the regrind % to the cavity times part weight to determine which formula will be used. The first calculation checks to see if the Shot Weight less the Shot Weight times the Regrind Percentage is LESS than the Cavity weight total. If so, then the new Shot Weight (BB) will be equal to the total cavity weight plus the runner/sprue weight times defined percent of runner and sprue*.

If the process will not produce enough regrind:

[If (AA - AB) < (Cav x Part Weight)] then BB = (Cav x Part Weight) + (Sprue x defined percent of runner and sprue*). Essentially this will require more material (LBS/K will be greater than if the process will produce enough regrind).

* The Defined percentage of runner and sprue can be set up for Injection and Diecast MFG Types, and for Custom MFG Types that default to Injection and Diecast, from Mfg Types->File menu->Alter LBS/K Calculation. (See Alter LBS/K Calculation in the Manufacturing Types section). The default is 10%.

If the process will produce enough regrind:

[If (AA - AB) > (Cav x Part Weight)] then BB = AA - AB. Essentially this will require less material (LBS/K will be less than if the process will not produce enough regrind).

➢ Use the same example as illustrated above, this time using the Allowable Regrind value equal to **25%**. The goal is establish a shot weight (BB), which takes into account regrind reusage.

Example:

   AA - AB = 15.7895 - 3.947 = 11.8425

   Cav x Cav Weight = 1 x 3 = 3

   11.8425 > 3 so the formula used is BB = AA - AB

   BB = 15.7895 - 3.947

BB = 11.8425

Therefore, Lbs/K Cycles = 11.8425 x 1000 / 453.6

Lbs/K Cycles = 26.11

➢ Use the same example as illustrated above, this time using the Allowable Regrind value equal to **85%**

Example:

AB =   15.7895 x .85 = 13.4211

AA - AB = 15.7895 - 13.4211 = 2.3679

Cav x Cav Weight = 1 x 3 = 3

2.3679 < 3 so the formula used is BB = (Cav x Part Weight) + (Sprue x defined percent of runner and sprue*)

BB = (1 x 3) + (12 x .1)

BB = 4.2

Therefore, Lbs/K Cycles = 4.2 x 1000 / 453.6

Lbs/K Cycles =9.26

Note: If the runner and sprue is zero and the allowable regrind is greater than the scrap % the system will simply take the Part Weight * Std Cavity / 453.6 *1000 to determine the LBS/K value.

Calculation examples for Regrind generated per 1000 part run

Allowable Regrind = 0

This calculation takes the total shot weight (AA), removes the cavity weight only, multiplies the remaining grams by 1000 cycles, then converts this value to lbs.:

(AA - (Cav. x Cav. Weight)) x 1000 / 453.6

15.7895 - (1 x 3) x 1000 / 453.6

12.7895 x 1000 / 453.6

Regrind generated per 1000 cycles = 28.195 lbs

This makes sense because the runner and sprue contributes 12 grams per cycle, compared to the 3 grams consumed by the actual part. This value will be very small if the runner and sprue represents a small volume of material consumed.

Allowable Regrind = 25%

Regrind generated per 1000 cycles run

(BB - (Cav. x Cav. Weight)) x 1000 / 453.6

11.8425 - (1 x 3) x 1000 / 453.6

8.8425 x 1000 / 453.6

Regrind Generated per 1000 cycle run = 19.494 Lbs
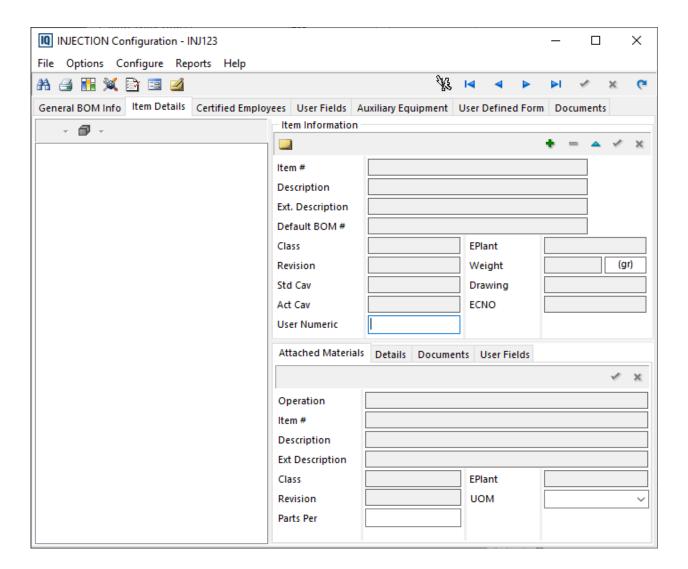
Item Details Tab

Once the general BOM information is entered, the user must add at least one item number. This information is detailed in the next section.

Attaching Item Numbers

A manufacturing configuration may contain more than one item number. The system provides the ability to enter multiple parts, along with packaging and components associated with each.

To begin entry:

➢ Click on the *Item Details* tab. The following screen will appear:

This screen contains a visual browser showing the relationships between item numbers that are made using this BOM, and other components and packaging items consumed *during the same process*. For example, you may create a part and immediately put the part in a box. When a work order is created that uses this BOM, then the production report will understand to add the finished good to inventory, and relieve the raw material *and* any attached component or package.
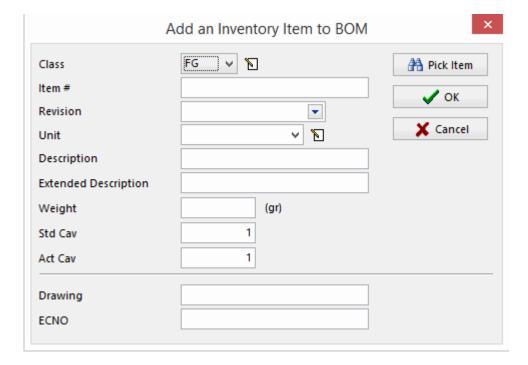
By highlighting any item in the visual view (left side of the screen), the details will be shown on the right side of the screen.

To ADD a manufactured item:

➢ Click on the Add [+] function key located on the navigator bar within the Item Info section of the screen, or right click anywhere within the left side of the Items Details screen and select the 'Add Item' function.

➢ From within the 'Add Inventory Item to BOM' screen, click on the Pick Item button to select an existing item from Master Inventory, or begin entering the item information in the fields provided. When adding a new item, be prepared to specify an item number, description, cavity weight, and the number of cavities before attempting to exit. For some manufacturing types, such as Generic, the system will automatically populate the Item # field with the MFG # from the General BOM Info tab. This value can be removed or modified.

Note: A circular reference error will occur if a users attempts to add the Primary Material of a BOM as a manufactured part on the same BOM.

The field listing below describes each field shown within the Add Inventory Item to BOM screen:

Class	Shows the class of the item that you are adding to the BOM. When you first enter this screen, the class field will default to 'FG' for Finished Goods item but can be changed by selecting a class from the drop down list.
	The master class list can be accessed by selecting the button next to this field.
	Note: You can create a BOM for a PK class item. The manufactured PK items will be calculated like an FG item if it has a Standard ID associated to it.
Item #	Enter in the inventory item part number.
	Note: If the 'System-Generated Inventory#' option is enabled in System Parameters->Sequential Numbering tab, the system will populate the item number with the next sequential number. If the user clicks on the 'Pick Item' button and clicks 'New' on the pick list, the item # will be the same as what was generated. For example, if the next sequential item was '123', when selecting 'New' on the pick list it will still be '123'. The value can be overwritten if desired.
	Note: If the 'System-Generated Inventory#' option is not enabled in System Parameters, for some manufacturing types, such as Generic, the system will automatically populate the Item # field with the MFG # from the General BOM Info tab. This value can be modified.
Revision	This field is optional though very important for tracking revisions to parts. It is used to distinguish between similar part numbers. (EnterpriseIQ sorts and stores unique part numbers based on Class, Item Number and Rev). You can use it to track any revisions made to the part and can also be retrieved in reports.
	The information can be typed manually or selected from a user defined list. (Uppercase is forced). To create the list right click on the Rev field and select 'Edit User Defined List'. Select the **+** button and enter the text. (This field is only 15 characters - any additional characters entered will be ignored).
Unit	This is the Unit of Measurement. Select the desired UOM from the drop down list.
	The master UOM list can be accessed by selecting the button next to this field.
Description	Enter a short description or common name of the item. The description entered here will be used throughout the system to identify this item.
Extended Description	Extended description field—use up to 100 characters for the description.

Weight	Enter the weight for a single item. The weight will be shown in either pounds, grams or ounces. If the UOM is set to GR in the **Quote** module under 'Misc/Rates and Parameters', the system will use that for the BOM UOM for Part Weight regardless of whether the System Parameter setting is Metric or Imperial. If the quote parameter UOM is set to null or any other value except GR the system will go to the System Parameters->Regional tab or EPlant Parameters (Enterprise->Miscellaneous tab) to determine whether to use the Metric or Imperial UOM.

If the default UOM was overridden it will look at the UOM field on the general BOM screen.

Do not multiply the weight by the number of cavities. Do not include runner and sprue weight. Also, do not include any additional weight an insert might add. **EnterpriseIQ** is only interested in the amount of material used to create a single part, even if the tool contains multiple cavities.

Note: The part weight displays out to eight decimal places when using pounds. |
| **Actual & Standard Cavities** | The Standard Cavity is the number of cavities in the tool for the item. The Actual Cavity is how many cavities in the tool for the item are functioning.

Actual Cavity is used to determine how many shots are required on a production run. The calculation is the number of Items Required divided by the Actual Cavities. For family tools, the item with the least number of cavities is used in the calculation.

For RT users, this is also used when shutting off cavities so that RealTime monitoring can count parts correctly. The user is given the option of changing the cavitation on a part directly through RealTime as well.

Standard/Actual Multiplier: If the box 'Assy at Machine' is checked, the actual and standard cavity fields will change to allow the entry of an item multiplier. Instead of entering the number of cavities, the user would enter in how many items will be produced with each cycle. Normally, this feature should only be used when setting up an assembly at the press configuration where you are ending up with more than one of the finished good items being produced.

Note: If desired, users may enter negative cavitation/multipliers on the BOM, although this is not recommended.

Note: When a parent item with multiple cavities has an existing firm work order in the system, newly created child work orders for new demand have the potential to be created for less than the amount needed to fulfill the new demand if the existing firm work order is allocated to the parent demand. |
| **Drawing No.** | **Optional**. The number entered here is used to track the drawing number for the part. Use up to 30 characters. |
| **ECNO** | **Optional**. This user defined field normally carries an engineering change number, but it can also be used to hold additional information about the part, such as a UL number.

Note: This is an informational field only and is not related to the ECO Quality module. |

➢ Upon selecting or creating the item, press [OK] to exit back to the *Item Details* Entry screen.

User Number field

On this screen there is an additional field called 'User Num'. This field is only used for EDI or Crystal reports. (The field is in the table Partno and is called Nuser1). The label text for this field can be changed by right clicking over the field and selecting 'Define Label Text'. The changes made to the text name will only affect BOM's with the same MFG Type.
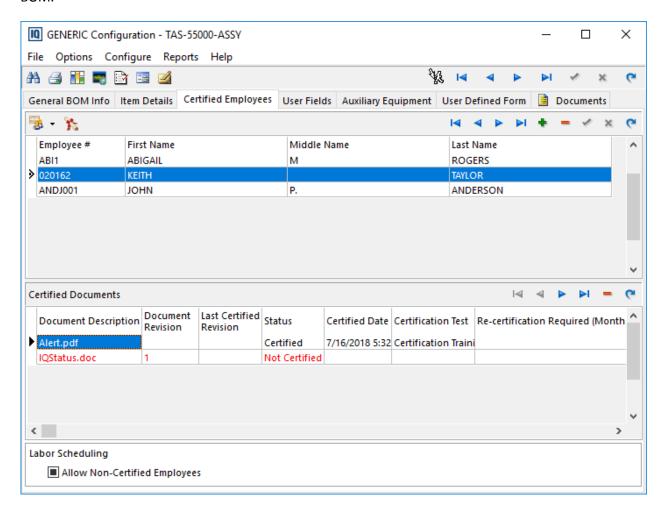
Item Details Documents and User Fields

- **Documents** - This tab contains Internal or External documents associated with the attached item in relation to this BOM. These documents can be selected to print with the BOM, Work Order, Routing Packet, All, or None. This option defaults to None. If the Print with Routing Packet option is selected for a document, when the Print Work Order speed button is selected from the work order module the routing document will also print.

- **User Fields** - This tab contains three alphanumeric and three numeric user defined fields that are associated with the attached item in relation to the BOM. The three alphanumeric fields can hold up to 255 characters. The user may change the label text of these fields by right clicking on them and then typing the new label.

Certified Employees

This is a list of employees that are certified to run the specific BOM. Logging into a work order in Task Clock from Time and Attendance or Task Clock in ShopData and AssyData will be restricted to only certified employees. Employees must be certified on all external documents associated to a BOM, that do not have the 'No Training Req' set to 'Y', in order to be able to clock in to the work order. If a non-certified employee attempts to clock into a work order they will receive an error, 'Document Name Not Certified', and will not be clocked in. (If there are multiple certified documents, the error will just list the first document in the Certified Documents list for the BOM).

The Certified Employees tab is applicable to BOMS for all MFG Types except: Outsource, ASSY1, ASSY2, and ASSY3. The Processes associated to the ASSY MFG Types have a Certified Employees tab and not the BOM.

To add employees, select the insert record (+) button to bring up the pick list of employees. Use the toggle buttons on the pick list or the Shift and Ctrl buttons on the keyboard to multi-select the employees to be added.

The **Certified Documents** section displays any External documents that have been associated to the BOM on the Documents tab. Upon adding a document, the employee is marked as 'Not Certified' and the line item is red. To certify an employee for **all** of the associated documents highlight the employee and select the 'Certify Selected Employee' speed button. A confirmation button will appear – select Yes to continue. The document(s) text will turn black; the status will say 'Certified', and the system date and time the employee was certified will populate in the Certified Date field.
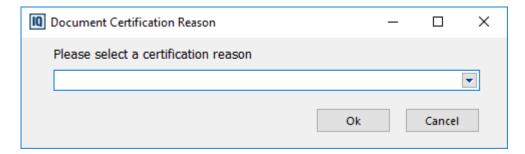
Manually Certifying Employees

Employee(s) can be manually certified on all of the documents associated to the BOM from the Certified Employees tab on the BOM. There are two certification options available from the drop down arrow on the 'Certify Selected Employee' speed button :

- **Certify selected employee(s)** - Select this option to certify the highlighted employees on the documents in the lower section. Employees can be highlighted in the grid using the Shift or Ctrl keyboard buttons. Once the desired employee(s) are highlighted, select this option. A confirm message will appear with Yes and No options. Select Yes to continue with the certification, or No to return to the module with no changes.

- **Certify selected employee(s) on all BOM(s) containing the same documents** - Selected employee(s) can be certified on all BOMs containing the same document by selecting this option from the drop down arrow from the 'Certify Selected Employee' speed button. A confirm message will appear with Yes and No options. Select Yes to continue with the certification, or No to return to the module with no changes.

Single Document Certification - To certify an employee on a single document, right click on the document and select '**Certify This Document**'. The specific document will be marked as Certified. A confirm message will appear with Yes and No options. Select Yes to continue with the certification, or No to return to the module with no changes. (Note: Employees must be certified on all documents before being allowed to log in to a work order for the BOM).

Certification Reason

When using any of the certification options in the BOM module, when 'Yes' is selected on the confirm message, a pop up form to enter the reason will appear. It is mandatory for a reason to be entered. Select the Certification Reason from the drop down list, or manually enter a reason. The drop down list is a user defined list. Right click on the blue arrow and select 'Edit User Defined List' to access the list to add or edit records.

Certification Revision Mismatch Status - If the external document is updated to a new revision the employee will not be certified any more for that document and the status will display 'Certification Revision Mismatch'. If the document has a Certification Test associated to it the employee will be prompted to take the Certification Test for the new revision of the document. If there is not a test, select the 'Certify Selected Employee' button to certify the employee to the latest document revision.
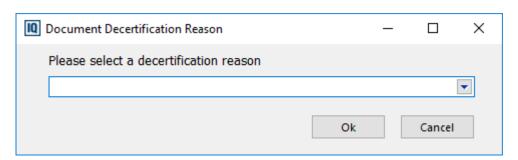
- When new revision is released the system will create a record in the log table. The Event is "Revision Change" and the Reason is "Document Revision Change".
- The Certified Employee tab will change from "Certified" to "Certification Revision Mismatch".

Re-certification Required (months) - This is the number of months required for recertification. This value comes from the External Documents tab, it cannot be edited from here. This is used in the Labor Scheduling module. An employee will display in blue in Labor Scheduling if they are due for re-certification. (Due for re-certification is determined if an employees Certified Date + # Months < Today's date).

De-certifying Employee(s) - Employee(s) can be de-certified on all documents or a single document.

- **Decertify selected employee(s)** - Select this option from the drop down arrow on the 'Certify Selected Employee' speed button. This will decertify the highlighted employee(s) on all documents associated to the BOM.
- **Single Document De-Certification** - To decertify an employee on a single document, right click on the document and select '**Decertify This Document**'. The specific document will be marked as Not Certified. A confirm message will appear with Yes and No options. Select Yes to continue with the de-certification, or No to return to the module with no changes.

Decertification Reason - As with the certification process a confirm message will appear with Yes and No options. When Yes is selected, users must enter a 'Descertification Reason' in the pop up form. Select the Decertification Reason from the drop down list, or manually enter a reason. The drop down list is a user defined list. Right click on the blue arrow and select 'Edit User Defined List' to access the list to add or edit records.

Note: Entering a Reason for certification/de-certification is only available when certifying documents at the BOM level. Users will not be asked to enter a Reason when certifying employees on documents from the Workforce module.

Remove an Employee - Select the minus (-) button to remove an employee. A confirm message will appear Stating, "Delete Employee?". Select OK to delete the employee or Cancel to return to the BOM. There is also a check box to remove the employee from All BOMs. (Note: This check box does not store its value, it will need to be checked for every employee removed in this way).

Note: If there are no certified employees listed, and there are external documents associated to the BOM, any employee will be able to clock into a work order associated to that BOM.

Certification Tests

Certification Tests can be associated to documents (in the Document Control module). When an employee that is not certified on the document attempts to clock into a work order they will receive an error, 'There are pending certification training tests required for this Work Order.   Would you like to take the test now?' If Yes is selected the system will present the employee with the test questions and multiple choice answers.   As the user progresses through the test, the percentage of correct answers will be compared to the Pass Percent on the Certification Training to determine whether the employee passes or fails. If a Certification Test is associated to the document, it will be listed in the Certification 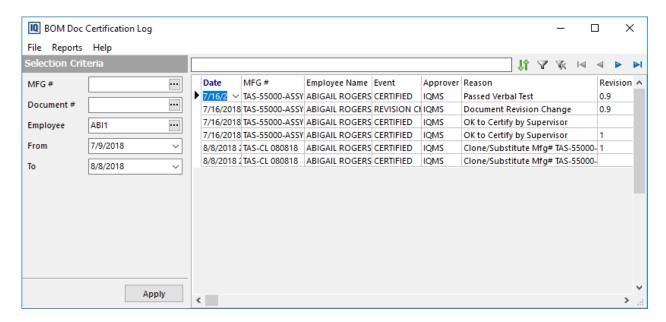Test field in the Certified Documents section.   If the employee passes the test the document will be marked certified for all instances where the user/document exists in BOMs, Processes and Employee Training records. Employees are prompted to take the Certification Test unless the Status in Certified Documents is set to 'Certified'.   If the external document is updated to a new revision the status will display 'Certification Revision Mismatch', and the employee will be required to take the test to be certified. (Please see the Document Control section of the Quality manual for more information on setting up Certification Tests).

Note: Employees can also access required certification tests from My Pending Approvals (accessed from the My Pending Workflows menu on the EIQ Launcher Bar). This enables employees to take the certification tests without having to log into a work order or process.

BOM Document Certification Log

A log of all BOM Document certification/decertifications is kept. This can be accessed from the speed

button on the Certified Employees tab. A report is also available with this information.

Selection Criteria

The fields available for entering selection criteria are: MFG #, Document #, Employee, From and To. When this form is opened the Selection Criteria defaults to the current BOM and the highlighted employee. The To date defaults to the current date and the From date is 30 days prior to the current date. All of the criteria can be changed manually to view the desired records. Note: When changes have been made to the criteria, once the form is closed and re-opened, the default selection criteria will display again.

- To clear a field, highlight the text and click the Delete button on the keyboard.
- To select a value in the MFG #, Document #, or Employee fields click on the ellipsis button to access the corresponding pick list, then select the desired record. To enter different dates, select the drop down arrow in each field to access the calendar.
- Once the desired values are entered press the 'Apply' button to refresh the data in the grid.
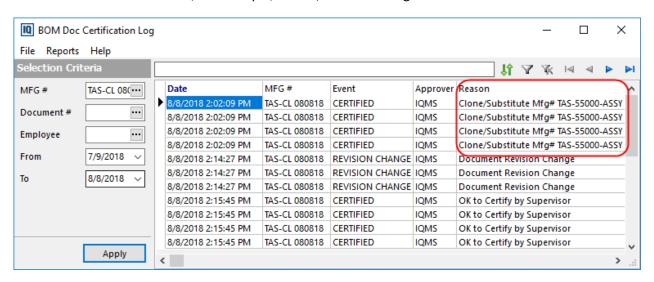
Grid Field Listing

Date	The date and time of the event.
MFG #	The MFG # associated to the log record.
Employee Name	The Employee Name for the log record.
Event	The Event. This field can be:
	- Certified - The document on the BOM was certified for the employee.
	- Decertified - The employees was decertified on the document on the BOM.
	- Revision Change - If the document has a revision change a log entry will be created automatically. The employee will also be automatically decertified on the document with a status of 'Certification revision Mismatch'.
Approver	The user name of the approver.

Reason	The reason selected when certifying or decertifying an employee.
	If the employee is certified after taking a certification test the reason will automatically populate with the name of the document and the employee's score. (i.e. "Certification Test 'Document Name.pdf' - 100").
	For a revision change, the reason field will populate with "Document Revision Change".
Document Name	The name of the document.
Document #	The Document number.
Revision	The revision of the document.
Library Name	The Library Name where the document resides.

Cloned BOMS, Substitute BOMs, and Sales Configuration Template Generated BOMs

- Certified employees are automatically certified on documents when a substitute BOM is created, either from a work order, or if one is created by the system for Logical Work Centers.

- Automatic certification also occurs for certified employees when a BOM is cloned if the 'Include External Documents' option is checked.

- Certified employees associated to BOMs created when sales quotes for sales configuration template items are converted to a sales order will be automatically certified.

For these scenarios a certification reason is automatically added in the BOM Doc Certification Log noting the MFG# it was created from, for example, "Clone/Substitute Mfg# TAS-55000-ASSY".

For employees that are not certified, they carry over to the cloned or substitute BOM as not certified, therefore no log entry is created.

Labor Scheduling

Allow Non-Certified Employees - This option is at the bottom of the Certified Employees tab in BOMs. This check box allows users to establish whether to allow Non-Certified employees to be scheduled in Labor Scheduling for the BOM. This defaults to un-checked. When a work order for the BOM is first scheduled the allow non-certify option in Labor Scheduling is updated with the control set at the BOM level. If this option is unchecked the Allow Non-Certified will be 'No' in Labor Scheduling. When this option is checked, Allow Non-Certified will be 'Yes'. The setting can be changed in the Labor Scheduling screen to override the BOM level setting. When it is manually changed, when removing the work order from the work center and then adding the work order back in the first position, the Allow Non-Certified will be populated with what is set at the BOM. When moving the work order from the first position into a different position on the same work center and then moving the work order back in the first position, the Allow Non-Certified will be populated with what was set in Labor Scheduling. When moving the work order from one work center to a different work center, the Allow Non-Certified will be populated with what was set in Labor Scheduling.

Documents and Routing Notes

Documents Attached to the Item

EnterpriseIQ supports attaching unlimited notes and documents to any item number. Use the Documents button to access the internal and external documents linked with the finished goods item number. This same list of documents can be accessed from within the Inventory module.

Note that the Documents button provides direct access to the *Item Number documents*, as opposed to the Documents *tab* which provides access to documents concerning the *configuration*.

The user can *add*, *edit*, and *delete* documents from the maintenance form that is displayed. Any changes made to the documents from this area will be reflected when viewing the documents for this item from within the Inventory module.

Routing Notes

In the Item Info section of the Items Details tab is a speed button to access a routing note field. This is a 2000 character note field used for work instructions for routings. This information will print on the Routing Packet report available in work orders.

Editing, Deleting Part Numbers

Editing Part Numbers Attached to a BOM

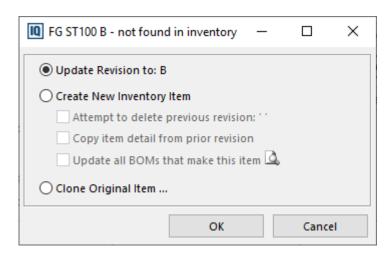To EDIT the part number once it has been linked to the BOM:

➢ Highlight the item in the visual view (left side).

➢ Right click on the item and select 'Change Item' from the menu that will appear, or highlight the item and click on the 'Edit' button located under *Item Info* (right side) to perform the same function. The following screen will appear:

Edit this BOM Inventory Item		✕
Class	FG ⌄ ▧	🔍 **Pick Item**
Item #	ST100	✔ **OK**
Revision	⌄	
Unit	EACH ⌄ ▧	✗ **Cancel**
Description	SEAT BELT TIE-DOWN	
Extended Description	MASTER PACK	
Std Multiplier	1	
Act Multiplier	1	
Drawing		
ECNO		

➢ Make any changes to the attached item through this screen.

If editing the item number directly, a prompt will appear advising the user that the item entered is not found in the Master Inventory and if you wish to create a new item? Enter 'OK' if this is the case.

If adding or changing the revision number, the following prompt will appear:

IQ FG ST100 B - not found in inventory	—	☐	✕

◉ Update Revision to: B

◯ Create New Inventory Item

　☐ Attempt to delete previous revision: ' '

　☐ Copy item detail from prior revision

　☐ Update all BOMs that make this item 🔍

◯ Clone Original Item ...

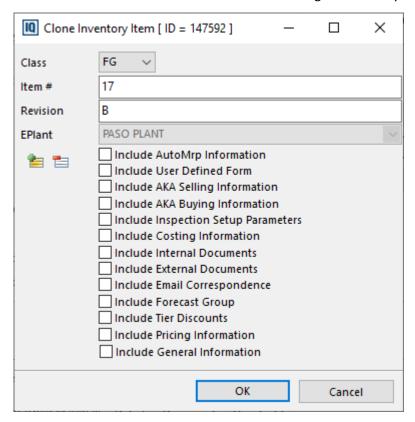| OK	Cancel

The user has three options:

- **Update current item** - This option changes the revision number but will not add a new inventory item. This option will overwrite the old revision number. If you need to track both revisions in inventory, select Create New instead. **Note**: This will only update the revision. If changes to other fields were made such as weight, the user will have to select edit again to make those changes. This is due to the fact that the information is found in two different tables.

- **Create New Inventory Item** - This option creates a new inventory item in the master inventory. The new item will now have this BOM as the Default Mfg # associated with it. The old item will no longer have a default manufacturing number.

  If the Create New Inventory Item is selected three additional options will be available:

  - Attempt to delete previous revision 'x' - This gives the user the option of deleting the previous revision number and/or copying the item info from the 'old' item. In order for the deletion of a previous item and revision number, the inventory item must not have any quantity on hand, be tied to any other BOM, have an existing Sales Order or Work Order, or be associated to a Forecast. This will delete the item from the system, it is not just marked inactive.

  - Copy item detail from prior revision - The copy option carries all the previous item's pricing, AKA customer information (i.e. quantities & price breaks,), Auto MRP data, Inventory Documents, Sales Account splits, and all standard costing information.

  - Update all BOM's that make this item - This will update all the BOMs that make the item. To view the BOM's that make the item click on the icon next to the field and a list of BOM's which produce the item will appear.

  Note: When using the Add a New Part Number (+) button in the Item Information section, these three options are not available.

- **Clone Original Item** -   Select this option to clone the current item and create a new one. This functions like the existing "Clone item" functionality. The Clone Inventory pop up form will appear for the user to select what to clone. See Cloning an Inventory Item for details.

Clone Inventory Item [ID = 147592]	— ☐ ✕
Class	FG ⌄
Item #	17
Revision	B
EPlant	PASO PLANT ⌄

☐ Include AutoMrp Information
☐ Include User Defined Form
☐ Include AKA Selling Information
☐ Include AKA Buying Information
☐ Include Inspection Setup Parameters
☐ Include Costing Information
☐ Include Internal Documents
☐ Include External Documents
☐ Include Email Correspondence
☐ Include Forecast Group
☐ Include Tier Discounts
☐ Include Pricing Information
☐ Include General Information

[OK]   [Cancel]

Note: When cloning an item the system will populate the item number with the next sequential number if the 'System-Generated Inventory#' option is enabled in System Parameters->Sequential Numbering tab.   The value can be overwritten if desired.

Pick Item

An manufactured item can be selected from the pick list if it already exists in master inventory. Select the Pick Item button and select the item that is manufactured using this BOM from the pick list. A confirm message will appear stating, 'The following inventory item details (description, ecno, drawing etc) is about to be updated...'. Select Yes to continue making the change. If this change affects the default BOM another confirm message will appear stating, 'Replace Default Inventory Mfg# with current Mfg Config # ?' Select Yes to change the default MFG # associated to the item to the current BOM or No to not change the default BOM. It also has the 'Do not show next time' check box if users do not want to be asked to change the default BOM.

Deleting an Item

To DELETE an attached item:

➢ Highlight the item to be deleted.

➢ Right click on the item and select 'Delete Item' from the menu that will appear. A prompt will appear asking you to confirm your actions.

➢ Select 'YES' to delete the item. This action will delete the item and all attached components and packaging.
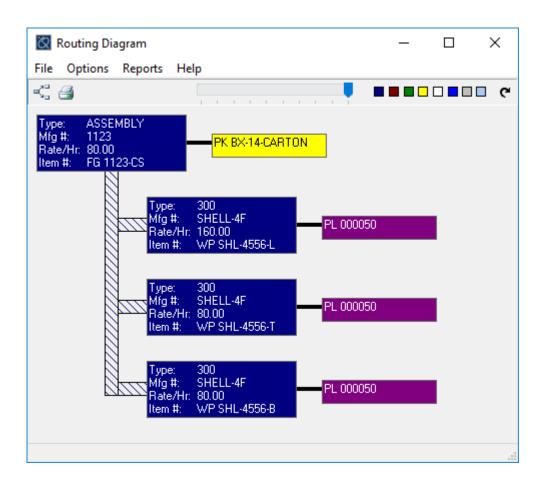
Note: You can also delete the item by selecting the item and clicking on the Delete [-] function key located on the Navigator bar within the *Item Info* section.

Item Details - Right Click Options

The right click options will depend on the record the user right clicks on.

When right clicking on a manufactured item the options are as follows:

- **Add Item/Material** - When highlighted on the manufactured item, this will open the 'Add Inventory Item to BOM' form, which can also be performed by selecting the plus button. When highlighted on an attached material the corresponding pick list (i.e. packaging items) will appear to choose an additional material to add. **Note**: If the 'System-Generated Inventory#' option is enabled in System Parameters->Sequential Numbering tab, the system will populate the item number with the next sequential number. If the user clicks on the 'Pick Item' button and clicks 'New' on the pick list, the item # will be the same as what was generated. For example, if the next sequential item was '123', when selecting 'New' on the pick list it will still be '123'. The value can be overwritten if desired.

- **Change Item/Material** - When highlighted on the manufactured item, this will open the Edit this BOM Inventory Item form to make changes. It is the same function accessed from the Edit Item button. When highlighted on an attached material the corresponding pick list will appear to choose a different material.

- **Delete Item/Material** - This will delete the attached item or material after selecting Yes on the confirm box.

- **Jump to Inventory** - This feature will take you to the inventory module for the highlighted item.

- **Jump to Transactions/Locations** - This will access the Transactions module for the highlighted item.

- **Jump to BOL Data** - This will access the BOL Data form for the item.

- **Jump to Inspection Setup** - This option will only be available for users who own the quality modules. It allows the user to jump to the Inspection Setup for the inventory item.

- **Jump to BOM** - This will be available for attached manufactured items, and will jump the user to the item's BOM.

- **Add Component** - Adds a component to the BOM.

- **Add Packaging** - Add a packaging item to the BOM.

- **Add Operation** - Adds an operation to the BOM.

- **BOM Tree** - This screen allows the user to see all required inventory for the manufactured item along with the requirements per item. This information can be exploded for a specific quantity. Click on the BOM Qty Explosion button and enter in a quantity. The information displayed will show the requirements per item, the required amount of material to manufacture the quantity entered, On Hand inventory, as well as non-committed material on hand. This function will show the user how much of the material in inventory that is not allocated towards existing orders. Select the Material Exception List button to open the BOM Tree Material Exceptions list. This list displays only the materials associated to the BOM. For more information please see BOM Tree in the Inventory section.

- **Routing Tree** - This screen displays the work center routing tree for the highlighted item.

- **Routing Diagram** - This feature brings up a color coded, visual routing diagram of the processes involved to make the highlighted item. This is based on the item and not the BOM. If there are multiple BOM's that make the same item, the default BOM will always be listed on the routing diagram, regardless of what BOM it is accessed from.
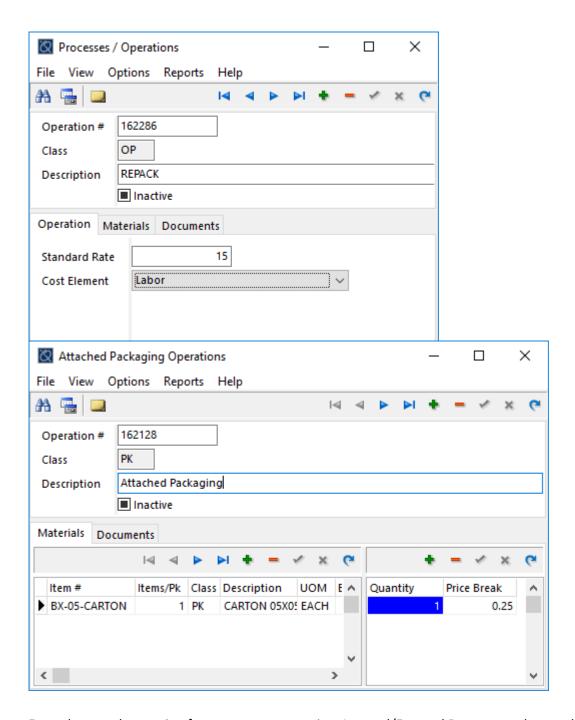
The boxes can be expanded (right click - expand) to view additional information. The additional information available is: On Hand, Non Committed, Std Cost, and Ext Cost. To set a quantity click on the BOM Qty Explosion speed button. Then right click on a box to see the additional information you selected in parameters for the quantity. For example, if the BOM explosion qty is set to 1000 and the purple material box is expanded, the amount of material required for that quantity will display along with any other options selected under parameters, such as on hand quantity. Select the printer speed button to print the Visual Routing report to a printer. From this form the user can also jump to Inventory, BOM, Process, or the Material Exception list. The jump to option will be grayed out if no jump is available.

- **Trace Item** - Allows the capability to trace changes to fields set up in the trace tables (System Parameters->Options->IQTrace Tables).

The same options are available when right clicking on an attached component or packaging item. The exceptions are, there will not be the Add Component/Packaging/Operation options, and the Add/Change/Delete Material options will allow for changing the attached component or package, and not the attached manufactured item.

When right clicking on an Operation (Attached Packaging, Attached Components, or Operation)   the options are:

- **Add Operation** - This will open the Routing or Standard Operation pick list to choose or create a new operation.
- **Edit Operation** - This will open the Operation form for the highlighted operation. This will be based on the type of operation: Attached Component, Attached Packaging, or Processes/Operations. The form below shows the Processes/Operation and the Attached Packaging for examples. Each time a component or packaging item is added to a BOM, and operation is automatically created.

From the actual operation forms users can associate Internal/External Documents that can be set to print with the BOM,Work Order, or both; and Routing Notes (select the to access the pop up form) that can be added to reports.

- **Delete Operation** - This will remove the operation from the BOM, but not from the system.
- **Edit Operation Routing Note** - This option will pop up the Routing Notes form to add/edit the notes.
- **Routing/Seq#** - This allows the user to edit the sequence # (the order is appears in the tree) for the operation.
- **Add Component and Add Packaging** - Allows users to add a component or package item to the BOM.

- **BOM Tree**, **Routing Tree**, and **Routing Diagram** as described above.

Attaching Packaging

EnterpriseIQ supports attaching unlimited packaging and/or components to any item number.

To ATTACH a packaging item, complete the following steps:

➢ Highlight the manufactured item to attach packaging to.

➢ Packaging can be added from the PK inventory pick list or from the AKA Item pick list. Use the drop down next to the Add Packaging to Item button at the top of the screen to choose the list. Users can also highlight the item and right click and select Add Packaging from the menu to access the PK Inventory pick list.

Note: The user must enter the packaging items into inventory before using this feature. However, packaging items may be created on-the-fly by selecting the "New" button within the Add Packaging Inventory pick list. Please see the section below called Creating New Packaging Items (Not found in Inventory).

➢ Use the Search or Sort function to locate an existing PK item number within the pick list.

➢ Click on [Select] when the item is found.

➢ The Items/Material Usage screen will appear where the user will enter the parts per package, scrap, and other information for the packaging item discussed below.

Parts/Package

After selecting a packaging item, the user will be asked to enter in the number of *Parts per Package*. Note: A null or zero quantity is allowed. A message will appear stating, "Parts per Package should be a number greater than 0. Are you sure you want to continue?". Select Yes to continue or No to return to the form to enter a value. Security can be placed on this message.

The parts per package calculation needs to know how many parts will be put into the packaging item selected. In the case of a box, for example, you will enter how many parts will be placed in the box. The system then removes the number of boxes based on the number of parts produced

For example, if putting a total of 5,000 parts in a box, with 1000 parts each in 5 bags with a single twist tie per bag, the number of parts per package would be 5,000 for the box, 1000 for the bag and the tie. Put the largest packaging item first in the list. In the example, the box should be first.

Note: During dispositions, EnterpriseIQ will remove Fractional Packaging items. From the example above, if there were 4,000 good parts produced, dispositioning would remove 0.8 boxes, 4 bags and 4 twist ties from packaging inventory. While it may seem illogical to remove a portion of a box or bag, the theory is that in most cases the partial box will be filled during the next shift. If shipping packages that are not full, you can make the adjustment during dispositioning.

If the parts use a packaging material that is not easily defined as a single unit (plastic wrap, paper wrap, etc.), then the user must calculate how many parts could possibly fit into the entire roll or item. For example, assume you stretch wrap the product using a 600 foot roll of plastic wrap. Calculate the number of parts a single 600 foot roll could wrap, and enter this value. In this way, EnterpriseIQ will figure how much of the material you used based on production.

Example One:

A single finished goods item requires three feet of string. In the packaging inventory this item's unit of measure is by the foot. Since we need EnterpriseIQ to subtract an appropriate amount of string per item produced, we must define the Parts/Package field as 0.33, since we need a total of three feet per item. Therefore, for every foot of string, we are only wrapping 0.33 of an item.

Example Two:

Assume you use tape to seal a box of items. Tape is maintained on the inventory list by the roll. We must determine how many of these particular items we can seal with a single roll of tape. If 100 parts are in a box, and we can seal 1000 boxes per roll of tape, then Parts/Package would be 100 x 1000 = 100,000. EnterpriseIQ will remove fractional portions of the tape as parts are wrapped and sealed. Therefore, you may have fractional packaging items on hand.

The additional fields on this form can be entered when adding an item or entered later via the Details tab for the Attached Material. Please see the section below on Attached Material Details for information on all fields. (**Details**).
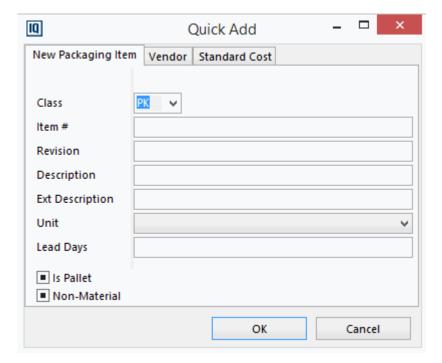
Returned Packaging - If the packaging item will be returned and reused and it is desired it shows up on the work order users can set this up on the BOM by adding the packaging item twice, once with a positive parts per and once with a negative parts per.

Creating New Packaging Items (Not found in Inventory)

If the packaging item cannot be found within the pick list, follow the steps below to quickly create the item needed.

➢ Select 'Add Packaging'.

➢ Click on the 'New' button located at the bottom of the PK Inventory Pick list.

➢ Enter in the information about the packaging item on the form that displays and click on [OK]. The minimum that can be entered is the Item Number, Description, and UOM. The user has the option of also filling in Lead Days, the default vendor, as well as standard cost information. Check the 'Non-Material' box if the new item is considered Non-material. Non Material items can be attached to BOMs but the system does not allow parts per to be entered for a non-material item. They can be shipped but are not dispositioned. Locations and On Hand quantities are not maintained for Non-Material items. If the packaging item is a pallet, check the 'Is Pallet' box. This setting is used to determine pallet count in conjunction with parts per on the BOM. In the RF module it is used for the print label function 'Print on Complete Pallet.' Based on the parts per field the system will recognize when a full pallet has been reached and prompt to print a label. Also, if this box is checked when a pick ticket is converted to a packing slip the Pallet Count field on the Packing Slip will populate automatically with the pallet count.
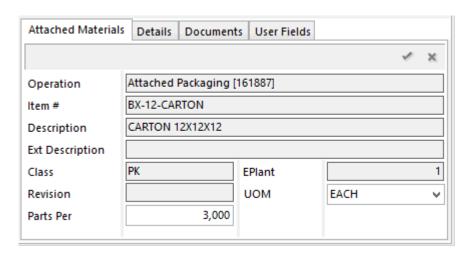
Note: When creating a new item the system will populate the item number with the next sequential number if the 'System-Generated Inventory#' option is enabled in System Parameters->Sequential Numbering tab. The value can be overwritten if desired.

> ➢ Enter the number of parts per package. Refer to the section above if help is required with this entry.

> ➢ Click on [OK] when finished.

Editing Attached Packaging

Once a packaging item is entered the parts per field may be edited and additional information may be added. The information regarding attached packaging or a component is on the bottom right side of the item details tab.

This section has four tabs which are associated with the highlighted attached item.

- **Attached Materials** - This tab displays the inventory information about the attached item such as Class, Item #, Rev and Description. Every time a packaging item is associated with a BOM the system creates a packaging operation. This information also appears on the tab. In addition to inventory data the user can edit the parts per information.

  The UOM (Unit of Measure) field can be used to specify a different UOM for usage than what the packaging item is stored in inventory. The UOM will default to the UOM associated with the inventory item but can be changed by selecting a different UOM from the drop down pick list.

  Parts Per - To Edit the Parts Per for a packaging item: Highlight the packaging item. Place the cursor in the Parts Per field in the Attached Material Specification section (right side of Item Details screen) and make the change. Click on the Post/Edit function key to save the change. If the value is changed to zero a status exception warning will appear "Field 'Parts Per' is 0". Select OK to change the parts per to zero or Cancel to return to the BOM to enter a quantity greater than zero. Security can be placed on this warning.

  If additional changes need to be made to the packaging item number, select the packaging item number and right click to bring up the submenu. Select 'Jump to Inventory'. This will bring up the Inventory screen and the item number to make changes to.

  Delete - To Delete a packaging item, highlight the item to be deleted. Right click and select 'Delete Operation' from the menu, and select 'Yes'. This will remove the packaging item that is currently attached to the part. **Note**: Make sure the correct operation is highlighted prior to deletion.

- **Details** - This tab contains the general and packaging details such as Scrap % and weights depending on the type of attached material. Please see Attached Materials (Components, Packaging and Operations) Details Tab in BOMs for additional options associated to attached packaging.

- **Documents** - This tab contains Internal or External documents associated with the attached item in relation to this BOM. These documents can be selected to print with the BOM, Work Order, Routing Packet, All, or None. This option defaults to None. If the Print with Routing Packet option is selected for a document, when the Print Work Order speed button is selected from the work order module the routing document will also print.

- **User Fields** - This tab contains three alphanumeric and three numeric user defined fields that are associated with the attached item in relation to the BOM. The user may change the label text of these fields by right clicking on them and then typing the new label.

Attaching Components

Attaching components is accomplished in the same manner as attaching packaging items.

➢ Highlight the manufactured item to attach a component to.

➢ Components can be added from the master inventory pick list or from the AKA item pick list. Use the drop down next to the 'Add Component to Item' button at the top of the screen to choose the list. Users can also highlight the item and right click and select 'Add Component' from the menu to access the master Inventory pick list.

Note: The user must enter the components into inventory before using this feature. However, components may be created on-the-fly by selecting the New button within the Select from Master Inventory pick list.

Note: When creating a new item the system will populate the item number with the next sequential number if the 'System-Generated Inventory#' option is enabled in System Parameters->Sequential Numbering tab. The value can be overwritten if desired.

➢ Use the Search or Sort function to locate the desired component within the pick list. Click on [Select] when the item is found.

Note: Blends cannot be attached as components. The components of the blend will backflush if the blend is placed as the primary material on the BOM (on General BOM Info tab); not as Attached Component (on Item Details tab).   Only the blended item will backflush when entered as an Attached Component.

Note: For family BOMs, sibling items cannot be added as each others components. For example, if a family BOM makes part A and B, if a user attempts to add A as a component of B, or B as a component of A, a circular reference will occur. This prevents circular references to happen elsewhere.

Note: When an item on a ECO BOM is edited it is given a Class of ~0. These items will be visible in inventory pick lists. If a user attempts to attach an ECO item to a BOM as a component an error will display, 'Cannot attach an ECO item as a component'.

➢ The 'Items/Material Usage' screen will appear asking how many components per part will be consumed. If the selected item is a non-material item the screen will not appear as the system does not allow parts per to be entered for a non-material item.

➢ Enter the number of components per part and press [OK]. Note: A null or zero quantity is allowed. A message will appear stating, "Components per Part should be a number greater than 0. Are you sure you want to continue?". Select Yes to continue or No to return to the form to enter a value.

Note: If a PK Class item is attached to a BOM as a component (rather than a packaging item) it will still be calculated as 'Parts per Package' instead of 'Components per Part'.

➢ Multiple components may be added using the steps described above.

Note: Each component will have a sequence # associated to it based on the order they were added. The sequencing can be changed by dragging and dropping the components in the left portion of the Items Details tab

Follow the steps under Attaching Packaging for assistance when editing or deleting a component(s). The steps are exactly the same.

Please see Attached Materials (Components, Packaging and Operations) Details Tab in BOMs for additional options associated to attached components.
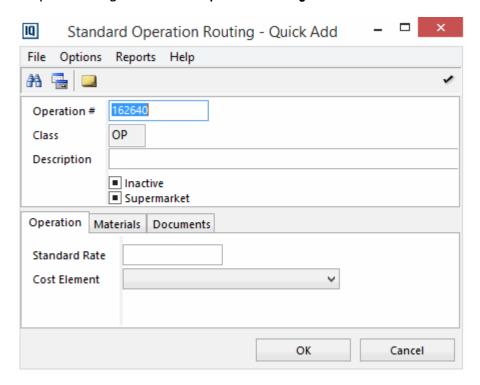
Attaching Operations

Attaching operations is accomplished in a similar manner as attaching components or packaging items. This feature is used to attach operations to the injection configuration versus creating a generic standard. By adding the operation here the assumption is made that it will be done within the cycle time and the operation does not change the manufactured part number. If the part number changes due to the operation (i.e. hot stamping a logo) or the operation time needs to be scheduled a generic BOM should be created.

➢ **Highlight** the FG item to attach an operation to.

➢ Select the **Add Routing / Std Operation** button at the top of the screen, or highlight the item and right click and select **Add Operation** from the menu.

The **Select from Std Oper / Routing** pick list will appear. Use the **Search** or **Sort** function to locate an existing Operation number within the pick list or create a new operation "on the fly".

Adding a new Operation

➢ Right click and select Add Operation or select the speed button, then select New from the pick list to get to the **Std Operation Routing** form:
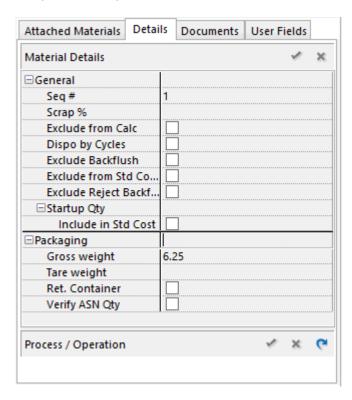
Use the field listing below for assistance in filling in each of the fields on this screen.

Operation #	The operation number will default to the next sequential number but it can be changed by typing over the number. Typically the value entered by the system is used because the Description field is used to describe the operation. **Note**: If this number is manually changed users could potentially end up receiving a unique constraint error if the number is already used.
Class	The class will fill in with OP and cannot be changed.
Description	60 alpha-numeric description of the operation.
Operation Info	Std Rate: This rate is defined per hour and is used for calculating the labor or overhead costs associated with the operation. The system uses this rate in conjunction with the Hours/Item value entered on a BOM in the Process Details section of the Item Details tab to determine the standard cost per item for the operation for the specific BOM. See the **Process Details (Operation Only)** in the Attached Materials (Components, Packaging and Operations) Details Tab in BOMs for more information. **Cost element**: Choose the appropriate cost element from the drop down menu. Note: In the Recipe Card in inventory, the 'Cost Contribution Type' field will always default to Labor regardless of the cost element selected here. The actual cost element in the upper section of the Recipe Card does correspond to the cost element selected here.
Materials	New or existing materials from inventory can be associated with the operation by clicking in the item # field to get an inventory pick list. Select an item from the pick list or select the 'New' button. **Note**: If the 'System-Generated Inventory#' option is enabled in System Parameters->Sequential Numbering tab, when creating a new item the system will populate the item number with the next sequential number. The value can be overwritten if desired.
Documents	Add any internal or External Documents related to the specific operation. These can be set to print with BOM and/or Work Order reports.

Please see Attached Materials (Components, Packaging and Operations) Details Tab in BOMs for additional options associated to operations.

Attached Materials (Components, Packaging and Operations) Details Tab in BOMs

The details tab allows the user to view and/or edit the details of the attached item (packaging or component) or operation.

The field listing below describes how to fill in each field shown in this section.

Seq #	Shows the order of each item attached. The sequence number will default to the order the item is added in. The sequence of the items can be changed by dragging and dropping them in a different order.
	Note for Packaging: The largest packaging item or the one that will be associated to the Bill of Lading should be Seq #1. The default method for calculating BOL' s uses Seq #1 packaging items to calculate the BOL data such as class.
Scrap %	This field is used to assign a unique scrap % to the attached item which takes into account fall out from using the item during the operation. This is always used in material planning and by default in usage (even when the material is hard allocated, scrap % is taken into account when calculating the materials involved in production reporting). It will tell the user to buy/produce more product, and more product will be dispositioned, unless the 'Exclude from Calc' option is selected (see below).
	This is calculated: (Quantity / (1-scrap%). If the quantity is 1000 and the scrap rate is 20%, the system would calculate the requirement as 1250 for the attached item. If the item is manufactured a work order would be created for 1250 pieces (assuming no other demand).
	This field is available for both components and packaging.

Exclude from Calc	With this checked the scrap percentage will not be included in the dispositioning or manual backflush calculations. Disposition and backflushing will only look at usage and not include scrap. (This does not affect material planning, the system will still tell the buyer to purchase more to compensate for potential scrap).
Disposition based on Cycles	Components and packaging can be consumed during the production reporting process via the total cycles counted, or based on good parts only. This method allows you to determine whether the insert can be reclaimed or not if the part is defective. If it cannot be reclaimed, then check this option. If this option is checked, EnterpriseIQ will calculate components or packaging used on total cycles. If left unchecked, the system will base components used on good parts.
Exclude From Backflush	When selected this option will keep the attached component from being dispositioned (either through production reporting or manual transactions with backflush). It will not show up in the material exception reports nor as a constraint in the CTP Diagram. The attached item will also not be included in standard costing unless the Include in Std Cost Calc option is checked. If this option is checked the option 'Exclude from Std Cost Calc' becomes unavailable and vice versa.
Include in Std Cost Calc	If the Exclude Backflush option is checked the user will see this option. Check this box to have the attached item included in the standard cost calculation.
Exclude from Std Cost Calc	If this option is checked the attached component/packaging will be backflushed/dispositioned but not included in the standard cost calculation. If this option is checked the option 'Exclude Backflush' becomes unavailable and vice versa.
Exclude Reject Backflush	When entering rejects if the user has the Backflush Rejects option checked in Security Inspector for their user name, the system will backflush the attached materials of the rejected item by default. This box can be checked to exclude the attached material from being backflushed when reporting rejects. For example, if an item is rejected it may not be placed in a packaging item therefore the package should not be backflushed when rejecting the manufactured item.
Exclude from KIT MTO	This option will only be visible for components of a phantom Kit item. With the option selected for a component within the parent BOM, this will exclude the purchased and/or manufactured component from automatically inheriting the MTO status of the parent Kit item on a Sales Order. Note: If selected for a manufactured component, this overrides the 'Cascade Parent MTO Designation' check box option in Inventory.

Startup Qty	A start up quantity can be entered in this field for the attached material. During the update schedule process the system will check if a start up quantity is required and if so the required material quantity will be added to the first date of each work order. For example, if a sales order has a requirement for 10,000 pieces and the system creates five work orders, the start up material quantity would be added in five times, one for each work order (or start up). The requirements will be visible in the Material Exceptions and Staging reports. The quantity entered here will not effect the standard cost of the item unless the 'Include in Std Cost option is checked. The system will use the inventory item's standard calc quantity to determine the costs. The Component Calculation = [(Components per part + (Start Up Qty / Std Calc Qty))/(1 - scrap percentage)] * components standard cost.
	Note: The system will factor in the startup quantity in material exceptions for a component with a zero or null parts per.
	Note: The system will only apply the startup qty to the consumed components as long as no labor reporting (process wip) took place for the parent item. For instance: Item A consumes Item B. The demand for Item A is 100, Item A needs 10 startup parts of Item B. As long as there is no labor (process wip) reported against Item A, the system will add 10 to Item B (during update schedule).
Include in Std Cost	If this is checked the system will include the start up quantity in the standard cost calculation.
Gross Weight (Pkg Only)	This field is used to enter the ENTIRE (final) weight of the packaging item (box). Includes all parts, bags, ties, etc.
	The Bill of Lading is based on pounds per cubic feet. Pounds per cubic feet are calculated based on box weight and the volume of the package.
Tare Weight	This is the weight of the empty packaging item.
	This information is used when BOL's are being calculated based on individual component weights. The program will add up all of the tare weights for the packaging and the net weight for the Finished Good based on the parts per in the BOM.
	Please see Calculate BOL based on individual component weights for more information.
Ret Contnr (Pkg Only)	This is for returnable containers and will only be used by the EDI module.
Verify ASN Quantity (Pkg Only)	This is used for EDI only.
	In the BOM, all returnable packaging items that need to appear on the EDI 856/DesAdv outbound transactions should be specified as packaging components and have the Ret. Container box checked. In addition, any returnable packaging items in which the quantity can vary per shipment (usually tops & bottoms), should have the Verify ASN Qty box checked on the BOM. For the inner returnable packaging item, the Seq # MUST be set to 1.

Overlap Hours (Manufactured Component only)	This option is only available for attached manufactured components. It is used for assemblies. This is the number of hours you can start on the next operation after starting to make the previous part. If you are creating part A and have an attached part B, without overlap hours the program will want to produce all of part B before you can begin production on part A. With overlap hours set you can start A after 'x' number of hours of starting B. The operations can 'overlap'.

This will adjust the must start time for child work orders. The must start date on the child work order will be based on the must start date of the Parent work order. The system takes that date and backs up the number of overlap hours to come up with a must start date for the child work order.

For example:

Prod Hrs for the Injection (Child) WO = 12.5

Prod hrs. for the Generic (Parent) WO = 6.94

No set up hours

Before overlap hours are added the must start date/time for the injection WO is 4:33:

Prod Hours	12.50
Must Start	5/27/2008 4:33:20 AM
End Date	5/27/2008 5:03:20 PM

Overlap hours = 6, the must start date is 11:03 (5:03 less six hours).

Prod Hours	12.50
Must Start	5/27/2008 11:03:20 AM
End Date	5/27/2008 5:03:20 PM

With overlap hours of less than the difference between the injection production hours and the generic production hours: The Must start is backed up by that difference.

12.5 - 6.94 = 5.55 or 5:33 hrs.

So with an end time of 5:03 pm, the must start time is 11:30 a.m.

(5:03 pm less 5:33 hrs = 11:30 am).

Prod Hours	12.50
Must Start	5/27/2008 11:30:00 AM
End Date	5/27/2008 5:03:20 PM	

Overlap Hours (Manufactured Component only) - Additional Examples	No Overlap Hours. Must start for child is based on its required production hours.

No Overlap Hours. Must start for child is based on its required production hours.

Production Hours	Cycles Required	Must Start	Must End
100	1000	11/18/2009 8:00:00 PM	11/25/2009
100	1000	11/12/2009 4:00:00 PM	11/18/2009 8:00:00 PM

2 Overlap Hours. Must start date for child is backed up 2 hours from parent must start date.

Production Hours	Cycles Required	Must Start	Must End
100	1000	11/18/2009 8:00:00 PM	11/25/2009
100	1000	11/18/2009 6:00:00 PM	11/18/2009 8:00:00 PM

2 Overlap Hours. When Production hours for child is greater than the parents and the difference is greater than the overlap hrs. Child's Must start = must start of parent less prod hrs difference (in this example = 25 hrs). The earlier must start date for the child is necessary for the job to be finished on time.

Production Hours	Cycles Required	Must Start	Must End
100	1000	11/18/2009 8:00:00 PM	11/25/2009
125	1000	11/17/2009 7:00:00 PM	11/18/2009 8:00:00 PM

2 Overlap Hours. When Production hours for child is greater than the parents and the difference is less than the overlap hrs. Must start date for child is backed up 2 hours from parent must start date.

Production Hours	Cycles Required	Must Start	Must End
100	1000	11/18/2009 8:00:00 PM	11/25/2009
101.503263	1000	11/18/2009 6:00:00 PM	11/18/2009 8:00:00 PM

Note: When using Batch Production, overlap hours should allow enough time to complete the quantity of the batch size.

Note: If overlap hours are used this information will appear on the Log tab in the MRP Engine (update schedule) screen. For example: *Overlap hours = 3 was used to calculate the must start date 11/28/2013 05:22:23 and must_ship_date 11/28/2013 09:55:54.*

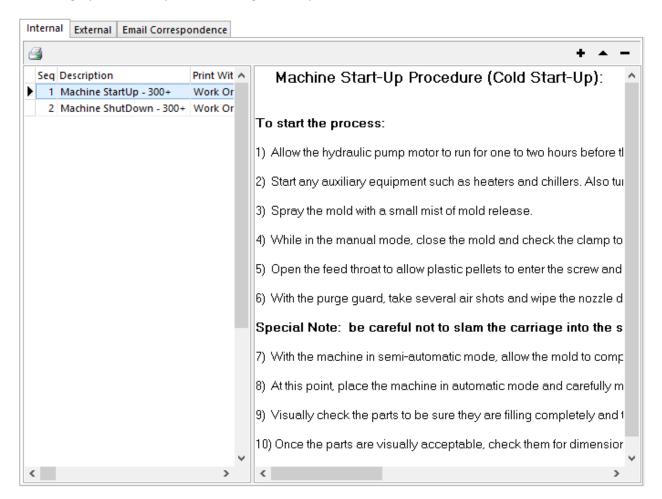| Process Details (Operation Only)	This is the time required to complete the attached operation on one item. This is used for costing information only. Select the UOM (Sec, Min, Hour, Day) from the drop down and then enter the cycle time. The system will multiply the Std Rate defined on the operation times the Hours/Item to calculate the standard cost per item. For example, if the time required is 15 seconds at a rate per hour of 25, the system will calculate the cost as 15/3600 * 25 = 0.104167.

This time is not included for scheduling purposes. If the operation requires more time than the standard cycle for the process and you would like to schedule the time - a Generic configuration should be created.

Documents Tab in BOMs

Each manufacturing configuration may have its own set of process instructions or notes such as machine setup notes and quality control information. The documents can be created and stored as an internal document or associated to a BOM as an external document. These two sections are discussed briefly below. For a full discussion on Documents within EnterpriseIQ please see the Documents section in Using EnterpriseIQ.

Internal Documents

The screen acts exactly like a word processor. The user can add, edit, delete, or print documents from here. Graphic images may also be imported into the document or text area. EnterpriseIQ supports.BMP or.WMF graphic files only. The following is a sample of the Internal documents screen.

External Documents

This section enables the user to be able to insert or open documents created in different applications such as Microsoft Excel Chart/Worksheets, Microsoft Word Documents, Acrobat Reader, Word pad, Bitmap images, etc. and map the path to these documents so that anyone can access them.
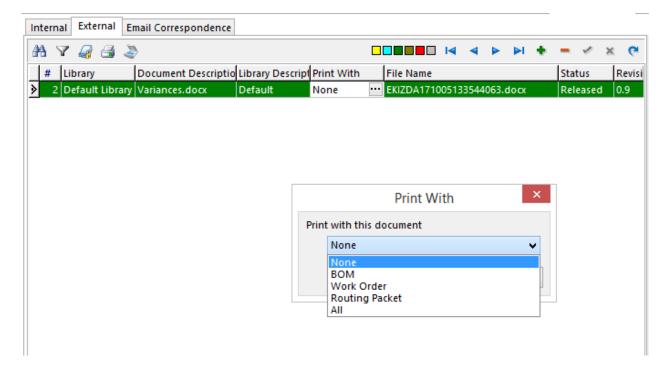
To CREATE a new document in this section:

➢ Click on the **ADD [+]** function key located on the Navigator bar.

➢ Find the location of the application or file and double click to select it. The File Name field will now contain the path or location of the document attached. If the user has the Document Control module the user will first select the Library and then the specific document in that library to be attached rather than the path.

➢ Click on [**Open**] to assign the document to this section.

To OPEN the document:

➢ Double-click on the file name, or select the document and right click. Select [**Execute**] from the submenu.

The program will open both the application the document was created in as well as the document itself.

➢ When finished viewing the document, click on [**Exit**].

➢ Note that with either an internal or external document you can specify what you want the document to automatically print with. To do this click on the "print with" field and choose from the drop down menu. You can print the document with the BOM, Work Order, both, or none. For External documents this defaults to None.

➢ For users licensed for Shop Data there are two additional fields: '**Place Shortcut**' and '**Shortcut Sequence**'. Attached documents with 'ShopData specified under the 'Place Shortcut' drop down appear on the RealTime Work Center screen in ShopData. The 'Shortcut Sequence' column allows users to specify the sequence that the documents appear.

➢ **No Training Req** - The External documents are also used in conjunction with Certified Employees. If Certified Employees are associated to the BOM, by default they are required to be certified on all External documents associated to the BOM. If employees are not required to be certified on a specific External document set this field to 'Y'.

➢ **Recertification** - This is the number of months required for recertification. This will carry over to the Certified Employees tab in BOMs. This is used in the Labor Scheduling module. An employee will display in blue in Labor Scheduling if they are due for re-certification. (Due for re-certification is determined if an employees Certified Date + # Months < Today's date).

Filter Dataset - Each External Documents tab within the modules will have a Filter Dataset button to enable users to filter the attached external documents by a field within the library, including the user defined fields. Select the filter speed button and enter the filter criteria in the pop up form.

Email Correspondence in BOMs

In addition to documents there is an Email Correspondence tab. From this tab users can to attach Email correspondence related to the BOM. To add an Email simply drag and drop it from Outlook or other email programs into the form.   A Received Date box surfaces if the system is unable to determine the date (such as: the Received and Sent dates differ, unclear binary data, or older data, etc.). Users are asked to provide the Received Date by selecting the correct date from the calendar. The From and Subject fields will also automatically populate with the information from the email. The date, from, and subject fields cannot be edited. A comment can be entered by double clicking the field. Enter the comment in the pop up box to further describe the email correspondence.

There are three ways to access the email once associated to the BOM:

▪ Double click on either the Received, From, or Subject fields.

▪ Right click and select View email.
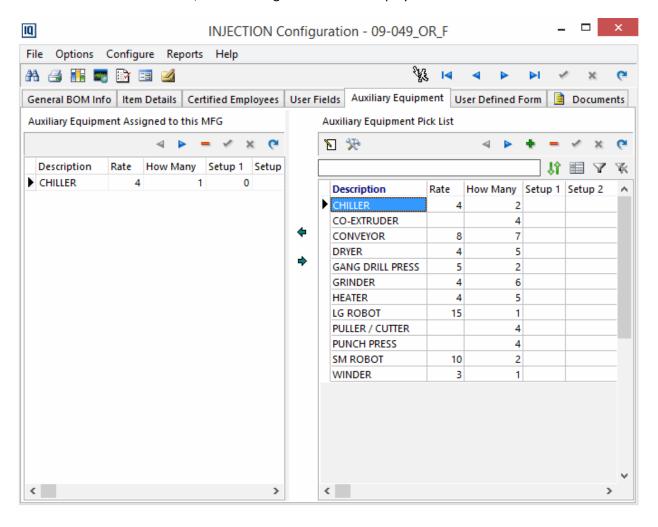
▪ Or select the View email button.

Note: Dragging and dropping from a local workstation to an RDS desktop does not work. Users in this environment can drag and drop an email .msg file from a network folder within RDS.

Auxiliary Equipment in BOMs

Auxiliary equipment can be associated to a configuration. By doing so, **EnterpriseIQ** can check for availability of the equipment via the Conflict Evaluator tool in the Scheduling module. This tool evaluates if there is a conflict for scheduled jobs, and lets the scheduler review any conflicts. (See Conflict Evaluator for details).

EnterpriseIQ will use the rate field for costing manufactured items if an Overhead Cost Element is associated to the equipment.

When this function is selected, the following screen will be displayed.

The left side box will display the items currently associated with the standard, the right side box holds all available items.

To ADD any new items to the Auxiliary Equipment pick list:

➢ Click on the **Add (+)** button on the left side. Enter the information in the applicable fields described below:

Description	The description can be up to 50 characters.
Rate	This is the hourly charge rate for the equipment. In Quoting, this rate will be added to the machine rate and included in production costs. In BOMs the rate is only used in costing if the auxiliary equipment has a standard cost associated to it.
How Many	How many of these particular items are available on the floor. This information is used to determine scheduling conflicts.
EPlant ID	Auxiliary equipment can be assigned to an EPlant. To do this highlight the equipment you want to assign and click on the EPlant icon next to the navigator bar. Choose one plant and then pick from the drop down list.
Warehouse/Division Name	Auxiliary equipment can also be assigned to a Warehouse/Division. Select the Warehouse/Division form the drop down list.
Cost Element	If the auxiliary equipment should be included in the standard cost calculations, select the ellipsis button in the Cost Element field and select the cost element from the pick list. This list will include cost elements with a Type of Overhead only. Note: Auxiliary equipment does include setup time in its calculations.
Setup 1 **Setup 2**	Setup 1 and Setup 2 values can be entered for an auxiliary equipment. The system will calculate the Setup time based on the predecessor's Primary Tool and use Setup Hours 1 or 2 from the BOM plus the Setup 1 time on each Auxiliary Equipment attached to the BOM being added to the schedule. If an Auxiliary Equipment matches the predecessor's auxiliary equipment the value from Setup 2 will be added instead of the value from Setup 1.
Teardown	A value can be entered in this field to track the teardown time of a piece of auxiliary equipment. The system will include this time in the setup time of the preceding job on the finite schedule. The teardown time added to the setup hours is the total number of hours for all equipment that will not be used in the upcoming work order. If more than one auxiliary equipment needs to be torn down then the value added to the setup hours is the sum of the teardown times of both. Note: This setting also affects Machine Capacity planning, Labor Capacity planning, and material exceptions dates, but not Daily projected requirements. Note: Teardown time is considered when using Auto Load to schedule work orders. Note: This field does not apply to the ASSY (1,2,3) MFG Types. Note: Teardown time is not considered in the Capable to Promise Calculation, the must start date, or costing calculations.

The user can edit the description, rate and quantity by highlighting it and typing the correction. An item may be deleted by highlighting it and pressing the [**Delete**] key. The items in this list are global for all BOM's and quotes.

➢ Auxiliary equipment can be linked to equipment in the Maintenance, Repair and Overhaul module by selecting the '**Assign Tooling Info**' button. Click on the ellipsis button in the Tool # field in the pop up form and select the MRO equipment to link to the auxiliary equipment from the pick list.

Associating the Equipment with the Standard

To make an entry in the Auxiliary Equipment Assigned to this MFG list:

➢ Select the equipment of choice by using the drop down menu in the description field on the left side of the screen, or highlight the auxiliary equipment you would like to attach on the right side of the screen and click on the arrow to the left hand button.

Likewise, you can easily remove an item from the BOM by highlighting it and pressing [**Del**] key or using the arrow over to the right button.

BOM Main Menu Bar Functions

Many functions are available regardless of BOM Type. Several of these options are available as speed buttons or accessed from the menus.

As with all modules the BOM includes the standard navigator bar to perform functions such as add, scroll and delete.

Note: To delete a BOM select the (-) button on the navigator. A confirm message will appear. If Yes is selected the BOM will be deleted. However, if the BOM or Substitute BOM is associated to a work order that is on a production report that has not been dispositioned an error will display and the BOM cannot be deleted..
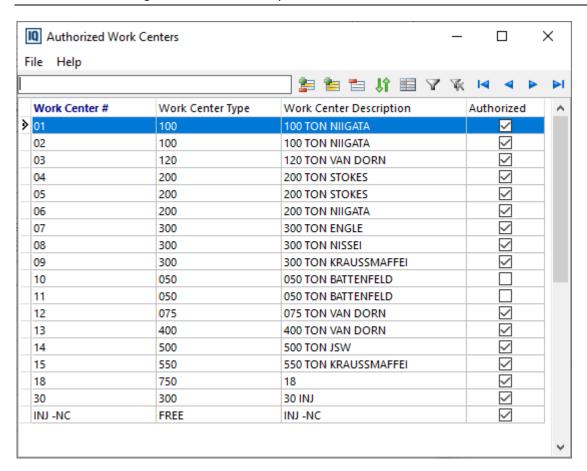
The following sections provide information on these common functions.

Authorized Work Centers

Authorized Work Centers can be established for BOMs to control where a work order associated to the BOM can be scheduled and added to production reports (by shift and by work order). If a user attempts to add or move a work order in the schedule, perform a setup from scheduling (not RealTime™), or add to a production report for a work center that is not authorized, they will receive an Authorization Required Status Exception message. The system does not evaluate whether the work center is authorized or not during Auto Load.

To access Authorized Work Orders select the speed button from the BOM form , or select Authorized Work Centers from the Options menu. A form will display that lists all work centers that are associated to the EPlant, Manufacturing Type, and Cell that are associated to the BOM.

Note: This applies to all MFG Types BOMs except ASSY1 and ASSY2. For ASSY1 and 2 the Authorized Work Center feature is designated at the Assembly Process level.

Work Center #	Work Center Type	Work Center Description	Authorized
01	100	100 TON NIIGATA	☑
02	100	100 TON NIIGATA	☑
03	120	120 TON VAN DORN	☑
04	200	200 TON STOKES	☑
05	200	200 TON STOKES	☑
06	200	200 TON NIIGATA	☑
07	300	300 TON ENGLE	☑
08	300	300 TON NISSEI	☑
09	300	300 TON KRAUSSMAFFEI	☑
10	050	050 TON BATTENFELD	☐
11	050	050 TON BATTENFELD	☐
12	075	075 TON VAN DORN	☑
13	400	400 TON VAN DORN	☑
14	500	500 TON JSW	☑
15	550	550 TON KRAUSSMAFFEI	☑
18	750	18	☑
30	300	30 INJ	☑
INJ -NC	FREE	INJ -NC	☑

By default all work centers in the form are marked as Authorized. Also, when a new work center is created that is based on the EPlant, Manufacturing Type, and Cell that are associated to the BOM, it will automatically be added to this list and marked Authorized. The Authorized check box can be unchecked to mark a work center as not authorized to run work orders associated to the BOM.   In order to check or uncheck the Authorized check box for multiple work centers at once use the toggle buttons or the Shift/Ctrl keyboard buttons to select the work centers to change. Then from the right click menu select 'Check Selected' or 'Unselect Selected' to update the Authorized check box for the highlighted work centers.

Users can sort based on any column in the table. This form also includes a 'Filter Dataset' button to filter the list.

The Authorized check box is also visible in the Runs the Best list. It is a read only field so changes cannot be made from Runs the Best list. Users can right click and jump from Runs the Best to the Authorized Work Centers form.

Note: When a BOM is cloned or a substitute BOM is created the authorized work center information populates based on the EPlant/MFG Type/MFG Cell query. In other words, if work centers were unchecked in the Authorized Work Centers form for the 'cloned from' BOM, they will be checked on the new BOM. The system does not assume that the authorized work centers will be the same for the cloned BOM.

Status Exception

For unauthorized work centers the Status Exception message will state, "BOM is not Authorized to run on this work center". The pop up message includes an OK and Cancel button, and a 'Do not show next time' option. Security is available on this pop message.

If the user has security for the OK button it can be selected to continue to add or move the work order in the schedule and add it to the production report for the unauthorized work center. If Cancel is selected the work order will not be added/moved.
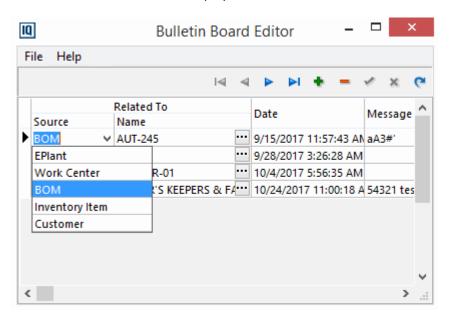
Note: There is not a parameter (setting) associated to this feature, the system will always evaluate for authorized work centers.

Note: This is separate functionality from the Runs the Best feature which has it's own warning when the scheduling parameter ('Verify Work Center from Runs The Best list') is checked.

Bulletin Board Editor

Select the **Add/Edit Bulletin(s)** button to create messages relevant to a BOM (as well as EPlant, Work Center, Customer, and Inventory Item) that can be seen in Scheduling, RealTime™ (Individual Center Info), and ShopData (RT Work Center).

The Bulletin Board Editor will display.

Select the Source from the drop down list. Then select the ellipsis button to access the corresponding pick list, i.e. BOMs, Work Centers, etc. Select the ellipsis button in the Message field to enter a message. The Date and User fields will populate automatically with the date/time the message was created and the logged in user name. These fields cannot be manually changed.

A Bulletin Board can be accessed by selecting the Show/Hide Bulletin Board button in the modules that have this feature (i.e. Scheduling). The bulletin board will display messages associated to the EPlant, Work Center, BOM, Inventory Item, and Customer if relevant to the current work center. The number of Bulletins will display at the top. The messages will be bold until marked read. Select the blue source header or the text to mark it as read. Select the 'Read All' button to mark all the messages as read.
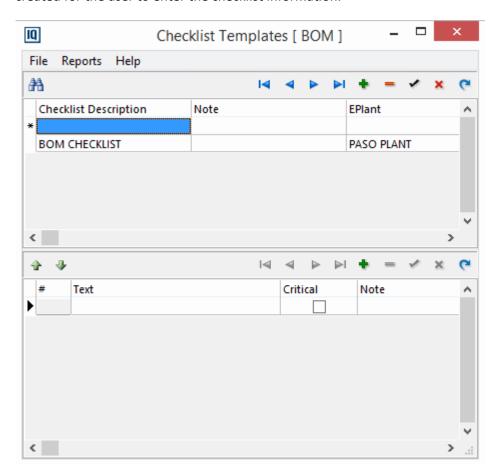

Note: This requires the IIS Server to be setup and the information populated in System Parameters->Company File Information tab->Web tab for the Bulletin Board to be available. Please see the *IIS Installation TechNote https://my.iqms.com/cfs-file.ashx/__key/Technote/IIS-Installation.pdf* for more information.

The Add/Edit Bulletin(s) button is also available in Customer Maintenance, Inventory, ShopData, and RealTime™.

Checklists

Checklists can be associated to BOMs. The checklist will display when a setup is initiated, for a work order associated to a BOM with a setup checklist, from EIQ RealTime™, ShopData, and RTStation. Checklists can also be associated to work centers and Assembly Processes. During a setup the web based Setup Checklist form will appear for the user to enter responses to the checklist items. If a BOM/Process and Work Center both have checklists the checklist will be combined on the same form with the Work Center's checklist listed first. A checklist history is stored for the work center or BOM/Process and can be reviewed at anytime, or used for reports.

Note: This requires the IIS Server to be setup and the information populated in System Parameters->Company File Information tab->Web tab in order to view the web based checklist. See the **IIS Installation TechNote https://my.iqms.com/cfs-file.ashx/__key/Technote/IIS-Installation.pdf** for more information.

Setup

To begin to use the checklist functionality checklist templates will need to be created. Select the 'Setup Checklist Templates' button at the top of the BOM module to access the checklist for the BOM. The Mfg # will appear in the title bar.

From this form select the template button to access the pick list of checklist templates. Select the 'New' button on the pick list to create a new template. The Checklist Template form will display with a new row created for the user to enter the checklist information.

Enter the data in the form. The top section is a description of the checklist.

Checklist Description	Enter the description of the checklist (up to 150 characters).
Note	Enter additional information about the Checklist (255 character limit).
EPlant	This will populate automatically based on the EPlant the user is logged into when the checklist is created. Users will only be able to see checklists for the EPlant they are logged into.

Enter the actual checklist items associated to the highlighted checklist record.

Sequence #	The sequence of the checklist item. The sequence can be changed using the up and down arrow buttons.
Text	The description of the checklist item. This is a list of steps involved in completing the corresponding Checklist.
Critical	Check this box if the checklist item is critical. Critical items must have the status column on the checklist populated with Y, N, or N/A in order to complete the setup checklist.

Note	A list of responses can be created which will apply to all checklist items. When the employee performs the checklist item they will be able to select from the drop down list, or manually enter a note (if allowed) in the Note field to further describe the outcome of performing the step.
	To create the list, right click and select 'Edit User Defined List'. Enter the list details in the text field. The Drop Down Style can be selected from the list:
	▪ Drop Down - Free form data entry.
	▪ Drop Down List - Predefined Text only.
	▪ System Default - Will be based on the setting in System Parameters

Once the checklist template has been created it can be assigned to BOMs.

Assigning a Template

From the BOM where the template is to be applied, select the 'Setup Checklist Templates' button at the top of the BOM module. Select the ellipsis button in the 'Setup Template Checklist' field. Select a template from the pick list. If a BOM has a Setup Checklist assigned and a user clones the BOM, the Setup Checklist will carry over to the cloned BOM.

As setups are performed for work orders for BOMs with templates, the system will pop up the web based checklist for employees to respond to the checklist items. This will populate the Checklist History portion of the Setup Checklist form.

Checklist History

Setup Template Description	This is the template description associated to the historical record.
Setup Date	The date/time the work order was setup.
Work Order	The work order number.
Created On	Date and time checklist record was created.
Created By	The user name that created the record.

The checklist results

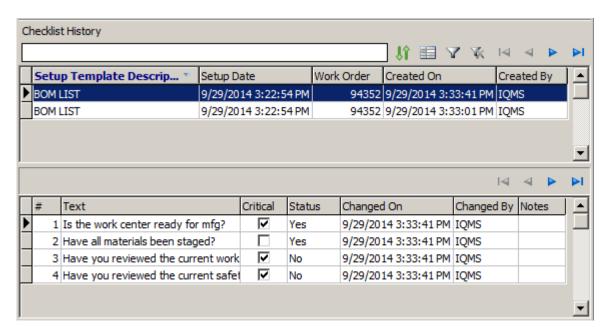| Sequence #	The sequence of the checklist item.
Text	The description of the checklist item.
Critical	This box is checked for a critical checklist item.
Status	The status entered during the checklist process for the item. This will be populated with Y, N, or N/A.
Note	The checklist note entered by the employee.

Checklist

During a setup the web based Setup Checklist form will appear for the user to enter responses to the checklist items. If a BOM/Process and Work Center both have checklists the checklist will be combined on the same form with the Work Center's checklist listed first.

Users can select Yes, N/A, or No for each question. There is also a comment field to enter notes for each checklist item. Once all of the checklist items have been addressed select the Submit Checklist button at the top. If a response is not entered for a critical checklist item (critical checklist items will have a red asterisk next to the number) upon submitting a popup with a Yes and No button will appear stating, 'There are critical items on the checklist that are not marked with a decision. Continue?'.   If No is select the user is returned to the checklist to enter a response. If Yes is selected, or if there are no un-answered critical items, a message indicating the checklist has been submitted will display. Select Close to exit the checklist. The work order setup will then be completed.

Checklist History

The information entered from this form is visible from the Setup Checklist form in the Checklist History section.

Cloning Configurations

EnterpriseIQ supports the ability to clone (copy) an existing standard. Differences between standards may be as simple as a single packaging item in one of the many part numbers, or as major as a change in material or color.

➢ Open the configuration to clone.

➢ From the menu bar, click on **File** and choose **Clone Configuration** from the submenu. The following screen will appear:

➢ Enter in the **New Manufacturing #**

➢ Check the desired options to include in the clone. Then press [**OK**].

- **Reuse Processes / Operations** - If this box is checked, the system will not create new processes/operations (i.e. attached packaging operations, attached process/standard operations, and Assembly processes) but instead will reuse the current processes/operations. Changes made on the process or components when this option is checked will affect both configurations.

- **Include User Defined Form** - check this box to include the data within User Defined Form fields in the main BOM and Runs Best forms.

- **Include Internal Documents** - check this box to include the internal documents.

- **Include External Documents** - check this box to include the external documents.

> **Note**: Documents included for cloning can be attached on the original BOM's main Documents tab, within the Runs Best form, and to components/packaging/operations/processes on the Item Details tab.

- **Clone All Manufactured items** - This applies to the Complex MFG Type only. If this option is checked, the parent item and all the children BOMs and items will be cloned.   The new MFG numbers of the children will be the 'MFG # - sequential #'.   The item numbers will be the 'item# -sequential #'. For example, if the item number associated to the original BOM # is F-38900, the cloned item number will be F-38900-1, if the original BOM is cloned again the item number would be F-38900-2. **Note**: When Cloning All Manufactured item, the system stops cloning designated child items with a break in the 'chain' of designated children. For example, Parent Complex item 123 has three children items: Child A - designated complex, Child B - NOT designated complex, Child C – designated complex. In this example, neither Child B or Child C will be cloned. Child C, even though it is designated complex, will not be cloned because Child B is NOT designated complex (breaking the chain). **Note**: In situations where the manufactured item has documents attached, when cloning Complex BOMs, if the same document record already exists on the target, it will be skipped.   This applies to internal and external documents as well as email correspondence. (The basis for comparison for emails is an exact match on subject and body text).

Most information from the standard (including routing notes, scheduling notes, 'From RFQ#', assigned Checklist Templates, and user fields) will copy over to the new configuration. To edit fields in the cloned configuration follow the steps mentioned later on in this manual. The following information will not be carried over to a cloned BOM: FG Lot #, an 'Inactive' checkbox selection, Email Correspondence, and the Runs Best 'From Date'.

If the BOM has an attached operation, a new operation record is created with a new number. This is to allow changes to the new operation without affecting the other BOMs that use the original operation.

Be sure to change the item number and description fields of any part that has changed.

Note: order to clone documents on the Certified Employees tab, the 'Include External Documents' option must be selected.

Note: Cloning while logged in as 'View All' will not clone an EPlant assigned on the original BOM.
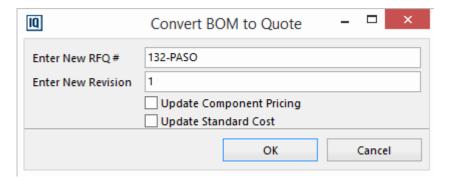
Convert BOM To Quote from the BOM Module

A single level BOM or multiple level BOMs can be converted to a Quote. This process will always make a new quote even if a quote exists for the exact BOM.

Convert to Quote (Single Level)

To convert a single level BOM to a quote click on the **Convert to Quote (Single Level)** feature in the **File** menu. A pop up form will appear with a field to enter the New RFQ # that will be created and a Revision.

- **Enter New RFQ #** - If the 'Enabled' checkbox is checked for the System-Generated RFQ # in System Parameters->Sequential Numbering tab, this field will be populated with the next sequential number. If the enabled option is not checked thsi field will be blank for the user to enter a value manually.

- **Enter New Version** - The revision field defaults to 1.

If the RFQ # and Revision already exist a warning will appear stating this.

- Select the **Update Component Pricing** box to have the system update the quote inventory price breaks and currently assigned price breaks with the Master Inventory price breaks from the Buying section (Buy/Sell tab). If the Update Component Pricing option is not selected, the pricing for purchased materials will come from the Buying section of the Buy/Sell tab in inventory for the item (never the AKA Buying section) *unless* the raw material is already in the Quote Inventory list. If it is in the Quote Inventory list the system will use that pricing even if it is null.   If the 'Update component pricing' is checked but the item has the 'Use Standard Cost in Engineering Quote' option checked (Additional tab in Inventory) then the system will not update the price breaks in the quote module.

- If the **Update Standard Cost** option is checked, items (primary material or attached materials) that have the 'Use Standard Cost in Engineering Quote' option checked will have the standard cost update in the price breaks in the quote module. If the item does not have the use standard cost option checked the system will update the price breaks based on the Buying section based on the Update Component Pricing check box.

- If the '**Quote Due Date is Mandatory**' default value (in Quotation Parameters) is checked the user must enter a due date for the new quote. If the parameter is not checked this field will not display.

All of the values from the fields in the BOM will populate into the quote such as Cell, Operators, Labor Rate, Cycle Time, Scrap, etc.

Note: The Units/Cycle field on the RFQ will default to one and should be updated to reflect the correct value.
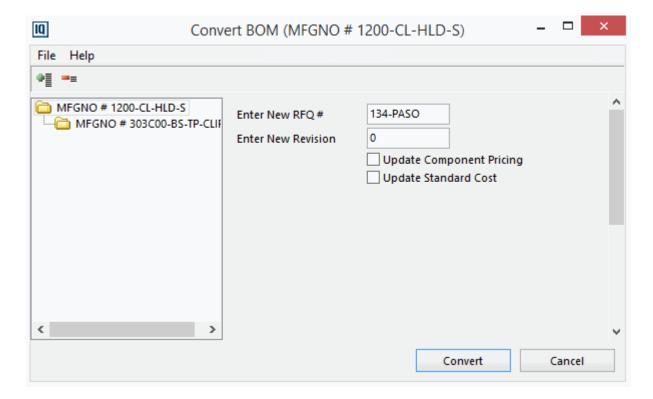
Note: Since a specific Work Center # is not associated to a BOM, when converting a BOM to a Quote using a Work Center with a Center Type that is also assigned to other Work Centers, the system will use the Center Rate, Fixed Center Rate, Setup Hours, and Startup Shots from the first Work Center created with that center type. To populate the fields for a specific work center, the user must select one by clicking the drop down or search button in the Work Center field on the quote and select Yes to the Confirm message to paste the values, then the rates associated to that work center will populate.

If the BOM is a Generic with attached items that are manufactured the system will first look in the quote database and if the item is found the system will use the quote prices. If the attached manufactured item cannot be found in the quote database the system will use the pricing from the selling prices on the Buy/Sell Pricing tab in Inventory.

Convert to Quote (Multi Level)

If the BOMs to be converted include several levels select the 'Convert to Quote (Multi Level)' option from the File menu. The following form will appear to enter/accept the New RFQ # and Revision for all associated BOMs. If the 'Enabled' checkbox is checked for the System-Generated RFQ # in System Parameters->Sequential Numbering tab, the Enter New RFQ # field will be populated with the next sequential number for each BOM being converted.

Note: If the same BOM is listed multiple times (same BOM attached to multiple different sub-BOMs), a new RFQ # is needed for each instance. If the RFQ # and Revision already exist a warning will appear stating this.

Highlight each BOM in the tree and enter the information in the fields. The check box options function the same as when converting to a single Quote.

Note: If the 'Quote Due Date is Mandatory' default value (in Quotation Parameters) is checked, the user must enter a due date for the new quote on the 'Convert BOM to Quote' pop up form. If the parameter is not checked this field will not display.

Note: If the 'Workflow Mandatory' Quote parameter is checked, a pick list of Quote Types will display after entering the details on the 'Convert BOM to Quote' pop up form. Select the quote workflow type from the list to continue converting the BOM to a quote. The same workflow type will be assigned to all levels when converting a multi level BOM. Users can modify the quote workflow type on a quote after it is created.

EIQ Bookmark for BOM

This option allows the user to drag and drop the icon onto the desktop or a folder in order to open the exact BOM up again with one click. Select the [icon] EIQ Bookmark button then drag it to the desktop or folder and drop it. The shortcut will be named BOM_id#.eiq by default.

Miscellaneous Parameters in BOMs

This form contains various miscellaneous parameters associated to BOMs in general and for specific BOMs. Security can be placed on these fields.

Efficiency Factor

The Efficiency Factor default for all BOM's is set up from here. This value will automatically populate the Efficiency Factor field when creating new BOM's but can be overridden for an individual BOM.
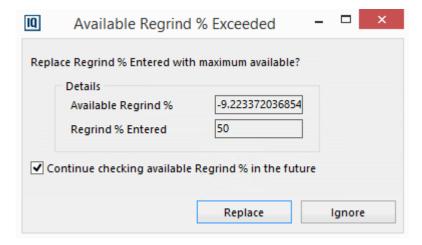
Mfg

Mfg Effective and Inactive date fields are informational only. If the BOM has an inactive date entered it will not stop the items from being entered in sales orders. These fields do show up on the pick list. To make the BOM inactive which will hide it from the pick lists, click on the Inactive check box on the General BOM Info screen.

Check Available Regrind %

This option will only display for BOMs with a MFG Type of: Blowmold, Diecast, Extrusion, Extrusion2, Extrusion3, Injection, Rotational, or SFoam. For the Stamping MFG Type it will say 'Check Available Waste % in lbs/k Calc'.

If this is selected, when the program calculates the lbs/K, it will calculate the available regrind (100*Runner wt/Shot weight) and will give a warning if the allowable regrind entered exceeds the calculated available regrind.

If the allowable regrind % is greater than the available the following warning box will appear:

The user can choose to Replace the Allowable Regrind % with the calculated amount or Ignore the warning.

Scheduling Options

- **Default Planning Fence**: This is a calendar days value that will automatically firm a scheduled work order during the update schedule process if it is scheduled within the planning fence. During update schedule the system will mark planned work orders that are finite scheduled within the planning fence days as firm. (Manual work orders will not be marked firm). Once the work orders are marked firm they will follow the firm work order rules and no changes will be made to the quantity. This will prevent any changes to work orders that fall within the planning time fence. (Note: As an alternative, there is a Scheduling Parameter,' Mark work order FIRM on setup', that when checked will mark a work order Firm when put into first position).

NOTE: If a work order is marked firm automatically because it was scheduled within the planning fence and is later moved outside the planning fence it will remain a firm work order. If the firm check box is cleared at a later date, the work order becomes a manual work order, and the normal manual work order rules would apply.

- **Mfg Planning Fence:** This option is **only** used in Master Planning Scheduling (MPS). The Mfg planning fence is the time frame in days when you want the system to warn you to address an issue about an item. For instance, if the Mfg planning fence is set for 15 days, and the order is due within that time frame, through Master Planning Scheduling, the user will get a message to make the work order firm and release it to the floor. However, if a Default Planning Fence is set the work order will be marked firm automatically if scheduled within the planning fence.

- **Scopes**: You can modify the Run Size Scope for the specific BOM from this tab. The value entered in the Mfg Run Size field for the specific BOM will override the run size set as the default. You can also view and modify the global Schedule scope and Run Size scope. If changed here the fields in Scheduling Parameters will also be updated. Changes made to these fields will effect many work orders, so change these values with caution. This is calendar days and not production days.

- **Start-up Primary Material**: This option is used to set a material requirement for start-ups. This option is only available for BOM's with a primary material. Enter the quantity of material required for start up. For example, if 25 pounds of material is required for the start up enter 25 in this field. During the update schedule process the system will check if start up material is required and if so the required material quantity will be added to the first date of each work order. For example, if a sales order has a requirement for 10,000 pieces and the system creates five work orders, the start-up primary material quantity would be added in five times, one for each work order (or start up). The requirements will be visible in the Material Exceptions and Staging reports. The quantity entered here will not effect the standard cost of the item unless the 'Include in Std Cost option is checked. The system will use the inventory item's standard calc quantity to determine the costs

- **Include in Std Cost** - Check this option to include the start up material in the standard cost calculation for the manufactured item. This value will be divided by the standard quantity and added to the part weight. Please see the standard cost calculations for more information.

- **Alternate Item Code** -   An Alternate Item Code can be associated to a BOM in order for the system to know which alternate items can be used for substitutions. The system will only show blends that are setup as Alternate Item of the original Blend with a matching Alternate Item Code. In the BOM Options menu select Miscellaneous Parameters. From the Scheduling tab select an Alternate Item Code from the pick list accessed by clicking on the ellipsis button in the field. See Alternate Items for more information.

Note: Security can be placed on these fields.

Labor Rate

You can set a different labor rate for this BOM for Current, Future, Budget, and Forecast costing if desired. Otherwise, the BOM will base labor costs on the default Labor Rate stored with the MFG Cell if applicable and if not it will use the MFG Type.

Labor Rate Hierarchy

1 First the system will use the employee levels set up for each BOM if other than the default is used. If the Default employee level is used the system will look at the following for the labor rate:

2 BOM/Options/Misc. Parameters/Labor tab.
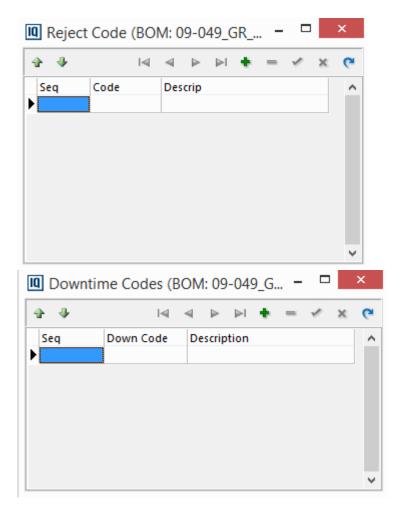
3 Mfg Cell.

4 Mfg Type.

In Employee Levels, MFG Types, MFG Cells, and BOM Misc parameters rates can be entered for Future, Budget, and Forecast that will be used when calculating the standard cost of an inventory item. If these are not populated the system will use the standard hierarchy for determining labor costs. Refer to Assigning Labor Cost Elements and Rates for more information.

Reject and Downtime Codes for BOMs

Each Bill of Manufacture can have specific reject and downtime codes associated to them. When displaying Reject and Downtime Codes in Shop Floor modules (RT Monitoring, RTStation, ShopData, IQRF and WMS) the system will display the sequential codes as follows:

- If there are reject/downtime codes on the BOM Level the system will only show those codes
- If there are reject/downtime codes on the Work Center level the system will only show those codes
- If there are reject/downtime codes on both the BOM and Work Center levels both will be visible
- If there are no reject/downtime codes on either BOM or Work Center levels all codes will display with soft filters on EPlant and the MFG Cell

To associate the codes to a BOM, select Reject Codes or Downtime Codes from the Options menu in the BOM module.
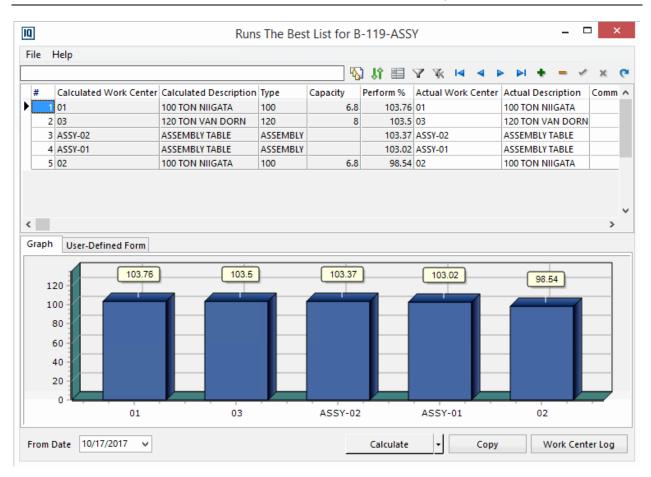

Select the insert record button and the next sequence number will populate the Seq field. Select the ellipsis button in the Code field and choose a code from the pick list. Only codes associated to the EPlant the user is logged into or null EPlant codes will appear in the list. There is also a soft filter on MFG Cell, where only the codes associated to the MFG Cell associated to the BOM or work center, or those with no cell will appear.

Continue this process until all of the desired codes have been added. The sequence of the codes can be changed using the up and down arrow buttons.

Runs the Best

Select the Runs the Best button or from the **Options** menu click on **Runs Best**. This is a list of the active work centers where the BOM runs the best. The system will automatically calculate which work center this Manufacturing Configuration ran best on from the overall efficiency information in Archived Production Reports. (Note: Inactive work centers are excluded from the runs the best calculation).

Note: When just beginning to enter data, no production history is available and the Runs the Best calculation will have no data. As the Production Reporting module is utilized and reports are archived, this feature becomes more useful, or information can be added manually.

Calculate Runs Best

To *calculate* the Runs Best information:

➢ Optionally select a **From Date** using the drop down calendar in the lower left of the form or leave it blank to go back to the beginning of all records.

➢ Then click on the Calculate button. The options for recalculating include:

▪ **Recalc for this BOM** - This will recalculate Runs the Best just for the current BOM.

▪ **Recalc and Roll for All BOM's** - This will calculate Runs the Best for all BOMs. The user can choose to include all manufacturing cells or recalculate just for a specific cell by making the selection on the pop up form that displays after selecting Yes on the confirm message. With this option the system will use the 'From Date' associated to each individual BOM if applicable.

▪ **Recalc and Roll for All BOM's - Set 'From Date'** - This option will recalculate the Runs the Best for all BOMs as above but will use the 'From Date' entered on the current BOM for all of them. A 'From Date' must be entered or an error stating, 'From Date' is not assigned - operation aborted' will appear.

The system will calculate the efficiencies of where the BOM has run based on production reports. This information is then available in scheduling from the 'Scheduling Pool' grid accessed by selecting Insert Job.

Note: The system calculates Runs the Best based on each production run for each work center. The total value for runs the best is the average of these calculations for that work center.

Note: The system will not remove work centers from this list when calculating runs the best regardless of the date in the 'From Date' field.

Runs the Best Calculation:

The calculation for Runs Best for the majority of manufacturing types such as, Injection, Diecast, Blow Mold, and Generic is as follows:

Runs Best % = (Effective Cycles per Hour / Standard Net Cycles Per Hour) * 100

▪ Effective Cycles per Hour = Good Parts / (Prod Hours + Chargeable Downtime Hours) / Actual Cavities (or Multiplier)

▪ Net Cycles Per Hour = For many manufacturing types this value is displayed on the BOM under Production Summary information. The calculation is based on the number of seconds in an hour and dividing it by the standard cycle time. Then factoring in the standard scrap % and the standard efficiency % thus giving you a net cycles per hour.

The calculation for Runs Best for the Extrusion manufacturing type is as follows:

Runs Best % = (Effective feet per Hour / Standard feet Per Hour) * 100

▪ Effective Feet per Hour = (Good Parts * Part Length) / (Prod Hours + Chargeable Downtime Hours)

- Standard Feet Per Hour = this value is displayed on the BOM under Production Summary information. The calculation is Feet/Hr = Feet/Lb x Lbs/hr.

Manually Entering Runs Best Information

Runs Best information may be added *manually* by clicking on the **Add (+)** button at the top of the form and then selecting the equipment from the drop down list in the Actual Work Center field. The only information that will appear is the work center number (no performance or bar chart information). If at a later date the Runs Best calculation is run the system will populate the existing manually created line with calculated information for that work center if applicable. If Runs Best has been calculated and a user attempts to add the same work center manually an error will occur, 'Actual work center selected was found among already calculated runs best records for this BOM. Operation aborted!'.

Note: The MFG Types of the Work Centers manually added to the Runs the Best list for the BOM should match the BOM's MFG Type.   When a Work Center with a different MFG Type than that of the BOM is added to the Runs the Best list, the system may load the Work Order onto that incorrect MFG Type Work Center during Auto Load.

Other Options in Runs the Best

- **Copy** - This button sets the Actual work center column to be equal to the Calculated work center column, overwriting any manual changes made to the actual work center field.

- **Wrk Cntr Log** - This button brings up the work center log for the Mfg #. The work center log is used to record and review notes, tool changes, or any other information pertaining to a job and the machine it ran on. See Accessing IQLog for more information.

- **Comment** - A comment (up to 60 characters) can be added to a runs the best record. This will be visible from this screen when accessed here and in the scheduling module.

- **Do Not AutoLoad** - If this is checked, the work center will not be considered when running auto load.

- **Authorized** - If the work center is marked Authorized in the 'Authorized Work Centers' module this check box will be checked. It is a read only field so therefore it cannot be checked/unchecked from here. Users can jump to 'Authorized Work Centers' from the right click option in the lower section. Refer to Authorized Work Centers for more information.

- **Documents** - Select the Documents button [icon] to attach internal or external documents to individual Runs Best work centers. These documents can be set to print with the work order when scheduled on that work center. Documents attached here can be set to print with None or Work Order.

- **User Defined Form** - Select the User-defined Form tab to create a form with user defined fields. The values entered in the fields is based on Work Center+Mfg#. See the User Defined Forms section for details.
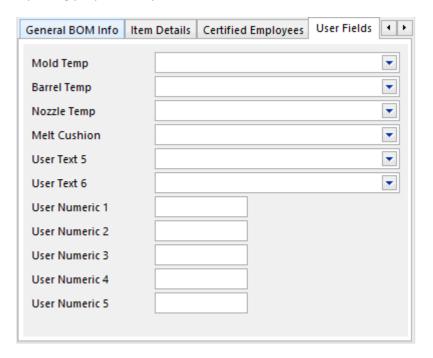
User Defined Form in BOMs

User defined forms allow the user to create a unique form to store information beyond the scope of the original BOM. Once established, this form is available to all BOMs. The User Defined form can be accessed from the User Defined Form tab, from the speed button, or from the Options menu.

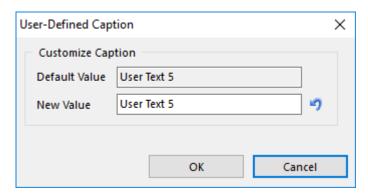See User Defined Forms for more information.

User Fields in BOMs

User fields can be accessed on the User Field tab or select **Options|User Fields** to access the six alphanumeric and five numeric user fields. These user definable fields are used for informational or reporting purposes only.

Note fields 1 - 6 are character fields, Value 1 - 5 are numerical fields. User fields one and two will display in the scheduling pool pick list when inserting a job on the schedule under the column titles of BOM User 1 and BOM User 2. The six text fields also are in the BOM pick list and will display the user defined label.

To define label text, follow the steps below.

➢ Right click on a field within the user defined screen and select **Define Label Text.** The following screen will appear:

➢ Type in the new caption under **New Value** and click on [**OK**]. You will be returned to the User Defined screen where you will see the new caption. Click on [**OK**] to exit. The new value will display for all MFG types.

For the User Text Fields the user can define a list that can be used to populate the user field rather than manual data entry. To edit the list for a user field, right click on the blue arrow and select 'Edit User Defined List'. A list form will appear to enter the Text selections that will be available when selecting the blue drop down arrow in the field.
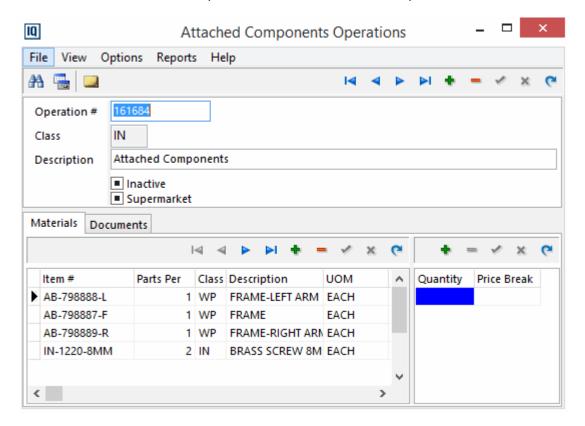
View/Edit Processes and Operations

From the **Options** menu select View/Edit Processes and Operations to view/edit packaging operations, component operations, blends, or processes/standard operations. When highlighted on a specific attached component/packaging item or operation on the Item Details tab, that record will appear by default. To choose another record first choose which view, click on View from the menu and select the type of operations you want to see. Then choose from the pick list the specific operation to view/edit.

- Attached Packaging - Review and/or change packaging operations.
- Attached Components - Change the details of attached components operations.
- Blends - Edit blend operations by changing blend percentages, blend components or pricing.
- Process/Std Operation - Edit attached processes or operations by changing the labor rate, the cost element or the materials involved.

Each time an item is attached to a BOM, an operation is created automatically. From this screen users can view or edit that information. Typically changes are made at the specific BOM level rather than attempting to find the specific operation that needs editing from this menu option. See Attached Materials (Components, Packaging and Operations) Details Tab in BOMs for details on all fields associated to attached materials.

From this screen it will list the operation number, class and description.

Material tab - The item or parts per can be edited from this tab. Select the ellipsis button in the Item # field to access the pick list. Type in the Part Per field to make a change to the number of parts per. If the item is a non-inventory item the user will receive an error stating, 'Parts per are not allowed for non-material items.'
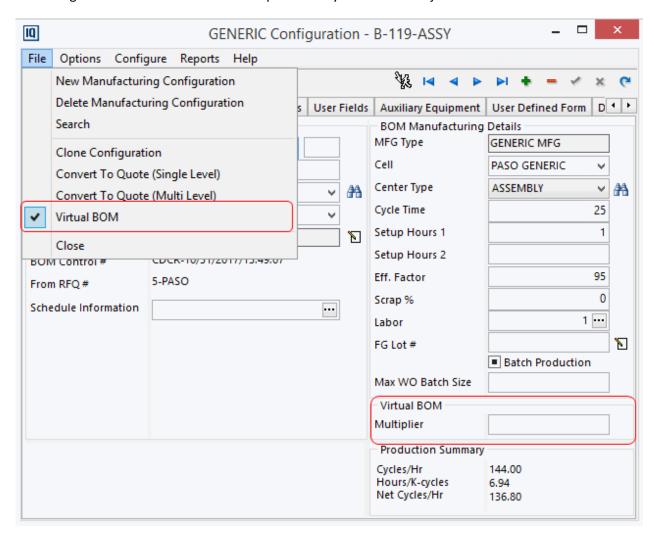
Documents tab - This tab includes access to the Internal and External document tab to associate documents to the operation.

Routing Notes - Select the Routing Notes speed button to enter up to 2000 characters of notes used for reporting.

Where Used - Select this feature from the Options menu to view which BOMs the operation is attached to.

Virtual BOM

BOM's that will be run on virtual work centers should be marked as a Virtual BOM. Once a BOM is marked virtual an additional field will be visible to enter the number of work centers that will be running this configuration at the same time. This option is only available for Injection or Generic BOM's.

To mark the configuration as a Virtual BOM, select 'Virtual BOM' from the File menu on the Bill of Manufacture.

Note: The setting in System Parameters > Company File Information > Application tab > 'Incorporate Virtual Work Centers / Work Orders' check box must be selected in order to see this in the File menu for Generic and Injection BOMs.

Once this option is selected the Virtual BOM Multiplier field will become visible. Enter the number of work centers that will run this configuration at the same time. This field will affect the Cycles/Hr, Hours/K Cycles and Net Cycles/Hr. This production summary information is used by the system to determine the production hours required for a work order, which in turn affects the must start date. This information is not used in scheduling; if the BOM's Virtual BOM Multiplier is set to 10, but the work order is scheduled on a work center with 3 virtual work centers, the system will divide the work order by 3 instead of 10.

Cycle/Hr	Basic calculation based on the standard cycle time, and how many cycles will occur in one hour. 3600 / Cycle Time) * Virtual BOM Multiplier
	Example:
	Assume 15 second cycle time and 5 virtual machines
	(3600/15) * 5 = 1200 Cycles per Hour
Net Cycles/Hr	The total number of assumed or net cycles that will be generated in an hour. This field is calculated by taking the number of seconds in an hour and dividing it by the cycle time, and then factoring in the scrap rate and the efficiency factor. This is the value used by the Work Order system to generate the total length of time required to manufacture the part(s).
	Example:
	(3600 / (cycle Time))(1-Scrap Rate percentage)(Efficiency Factor) * Virtual BOM Multiplier = Net Cycles/Hr.
	Assume Cycle Time = 15 seconds; Scrap rate = 4; Efficiency Factor = 90 ; and 5 virtual machines (3600/15) * .96 * .9 * 5 = 1036.80 Net Cycles per hour
Hours/K Cycles	This value displays the number of hours required to complete 1000 cycles. It is based on the Cycles per hour. Hours/K = 1000/ Cycles per hour.
	Assume 1200 cycles per hour
	1000/1200 = .83

Note: The 'Virtual BOM Multiplier' is ignored when calculating the standard cost.

Adding a new child work center to a virtual work center while a job is running will not affect the currently running job. The next job setup will be divided by the number of child work centers associated at the time of setup.

Blend Technology

EnterpriseIQ supports two kinds of blending activity. The first, and most straightforward, is to simply create an inventory item of class PL, then assign two or more materials, by percentage, to the item.

Each material attached to the blend is measured as a percentage of the whole. For example, a simple blend may consist of 50% of one type of material and 50% of another. During the production reporting process, and depending on how the blend was set up, the base blend material or it's individual components will be relieved. (See Defining a New Blend Operation for more information).

Another blend method is to use a Generic BOM. Like the basic method, this technology allows the creation of a material specification which can call an unlimited number of other materials. Used in this manner, **EnterpriseIQ** can be used to create work orders, and the actual operation of creating the blend can be scheduled like any other job.

Because blends created in this manner can also be consumed by another BOM, you can create an operation to make the blend, then consume it during a production process. **EnterpriseIQ** can report that you need to make the blend (if none is already available) and that you need to purchase the raw components, if they are also unavailable. In essence, this technology can therefore be used to schedule pre-operations.

It is also an option to create Phantom items where work orders are not created, but the system will automatically know to consume the components if the phantom item inventory level is zero. (See Creating BOM's for Blends and Regrind using Phantoms Items for more information).

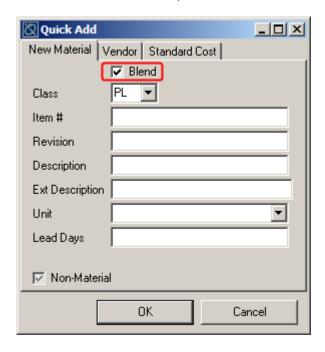# Defining a New Blend Operation

If the raw material required is not in the master inventory pick list, the user has the option of being able to define a new raw material while creating the manufacturing configuration. Defining a new material may include defining a blend of multiple materials.

To create a new raw material that is not a blend from the Quick Add form enter the Class, and item information but do not check the Blend box.

EnterpriseIQ only allows the user to call one raw material inventory item per configuration. If the item will require a blend of two or more raw materials, the user can create an operation that will call these multiple inventory items. Creating a Blend Operation will also add a Blend item to inventory.

Follow the steps below for creating a blend operation.

➢ From the General BOM entry screen, select the pick list near the Material Spec. field.

➢ At the bottom of the pick list, select **New.** The following screen will appear:
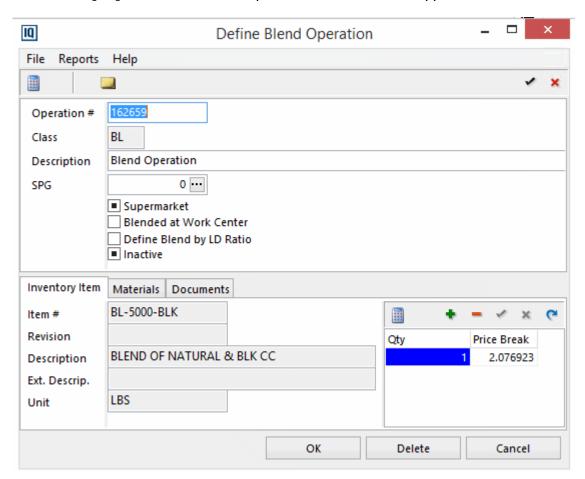

Make sure and place a check mark in the box near the word "Blend." This tells the system that this material is made up of a blend.

Use the field listing below for assistance in filling in each of the fields on this screen.

Class	The Class defaults to PL but can be changed to any class that is designated as a primary material.

Item #	Enter the blended raw material item number here.
	Note: If the 'System-Generated Inventory#' option is enabled in System Parameters->Sequential Numbering tab, the system will populate the item number with the next sequential number. The value can be overwritten if desired.
Rev	Enter a Revision number.
Description	Enter a description here to identify the item number. The description entered here will be used throughout the system to identify the part number.
Unit	Unit of Measurement. Click on the arrow down near this field to select the unit of measurement (i.e. each, lbs, gal, roll, ft. or in).
Lead Days	The number of calendar days it normally takes to receive this item once a purchase order is created. Primarily used for purchased items. Used in the Material Exception List to generate a Must Order By date based on the Must Arrive By (manufacturing) date.
	This will populate the lead days field in inventory.
Vendor	From the Vendor tab the user can enter the default vendor for this material. Click on the ellipsis button on the Vendor # field to bring up the Vendor pick list. Select the vendor from the list and select OK.
Standard Cost	During the Quick Add process the user can also associate the new material with a standard cost element and a standard cost. From the Std Cost tab select a cost element from the drop down list in the field. Then enter a standard cost for the item.

➢ Click on [**OK**]. The Define Blend Operation screen will now appear.
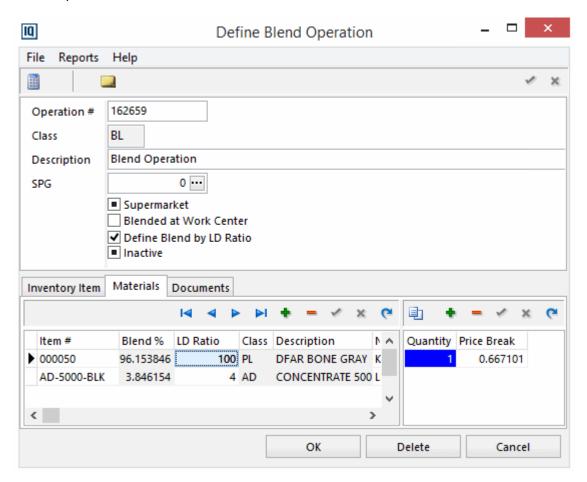

The information shown in the top portion of this screen is generated by the system. You can accept the Operation # and Description shown or make a change prior to going onto the next step.

➢ If the material is to be blended AT the work center, then click on the box indicating so. If it will be blended AWAY from the work center, leave this field blank.

Options	Dispositions	Material Planning
Blended at Work Center **is** Checked	During dispositioning only the individual components will be relieved from inventory.	Material Planning will look at the on hand of the components NOT the blend.
Blended at Work Center is **not** Checked	During dispositioning only the blend item will be relieved from inventory.	Material Planning will look at the on hand of the Blend first then the components second.

Note: Whether a material is blended at the press determines how the raw materials will be relieved from inventory. When a blend is made at the Work Center its "individual ingredients" are removed from inventory at the time of production; when a blend is made away from the Work Center the "Blend inventory item" is removed from inventory.

➢ Choose if the blend will be defined by Let Down Ratio. Check the LD Ratio box if the material usage will be based on a Let Down Ratio versus a percentage.

➢ Now, select the **Materials** tab located towards the bottom of this screen.

➤ Click on the **ADD [+]** function key.

➤ Click once on the **Item #** field and then again on the pick list box (shown above) within this field.

➤ Select the **material** to be used in the blend.

Notes: The materials added to a blend must all have the same unit of measure as the raw material inventory item. If a blend has a unit of measure in LBS the components must be in LBS also.

Manufactured items should not be added as components of a blend operation as a work order will not be created for the component since a work order is not created for the blend. In situations where a manufactured item is part of a blend users should create a BOM for the blend rather than use the blend operation functionality. See Creating BOM's for Blends and Regrind using Phantoms Items for details.

➤ Enter the **blend percentage** amount this raw material item takes as part of the overall blended material or if you are defining the amount of material required based on a **Let Down Ratio,** enter that amount. There may be an unlimited amount of raw materials that make up the blended item, but the total percentage of all the items equal 100%.

➤ Click on the **Post/Edit** function key within this section prior to exiting this module.

NOTE: You will not be allowed to exit from the Define Blend Operation screen until the total equals 100.
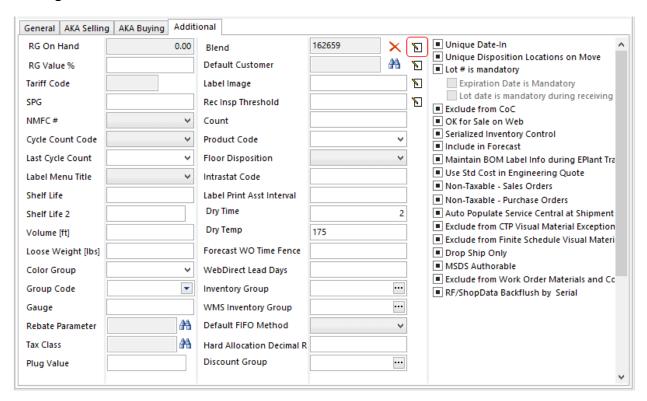
Blend Standard Cost

EnterpriseIQ computes the standard cost of a blend based on the standard cost of each raw material in the blend when you define it. To calculate the standard cost, go to the STD Costing tab of the blend inventory item and click on the Calc button and say Yes on the Confirm box. The Cost Calculations form will appear showing the Current and Future standard cost for the blend. To accept the new standard cost, click on the Roll to Standard Cost button. This standard cost is copied to the inventory file on the STD Costing tab as the raw material cost.

Blend Buying Price Breaks

The price breaks for the blend can be manually entered or they can be calculated on the Inventory Item tab of the blend form. Click on the calculator button in the lower section to calculate the price for just this blend. Choose which price break structure to use. The system will then calculate the price breaks based on the prices associated with all of the attached materials and the percentages required for the blend. These price breaks will then fill in on the Buying portion of the Buy/Sell tab on the main inventory form.

To calculate the price for ALL blends click on the calculator button at the top of the form. The breaks will use the same quantity price bracket used during the first calculation or if this is the first time calculated, the program will use the item with the largest percentage.

Editing a Blend

If the raw material attached to the configuration needs to be edited, complete the following steps:

➢ Place the cursor on the **Material Spec. description** field and right click.

➢ Select the option "**Jump to Inventory**" from the menu. The Inventory module will appear with the raw material item to change.

To **EDIT** the materials that make up the blend:

➢ Under the *Additional tab* (bottom of screen), click on the **Define Blend** button near the Blend field. The *Define Blend Operations* screen will appear.

To **EDIT** the item number information:

➢ To make changes directly to the materials attached that make up the blend, click on the Materials tab. From this screen, the user can change the blend item numbers, blend percentage(s), quantities and price breaks. Additional notes may be attached (or changed) at this point by clicking on the Notes tab.

Remember to **SAVE** all changes before exiting back to the BOM entry screen.

Creating BOM's for Blends and Regrind using Phantoms Items

A phantom item is a product that is consumed in a higher Bill of Manufacture. If an item is marked as a phantom the inventory level will never go negative when being consumed unless the Drive Phantom Negative check box is selected. Instead the components of the phantom item will be removed. Items that are marked as phantoms will not have work orders generated for them.

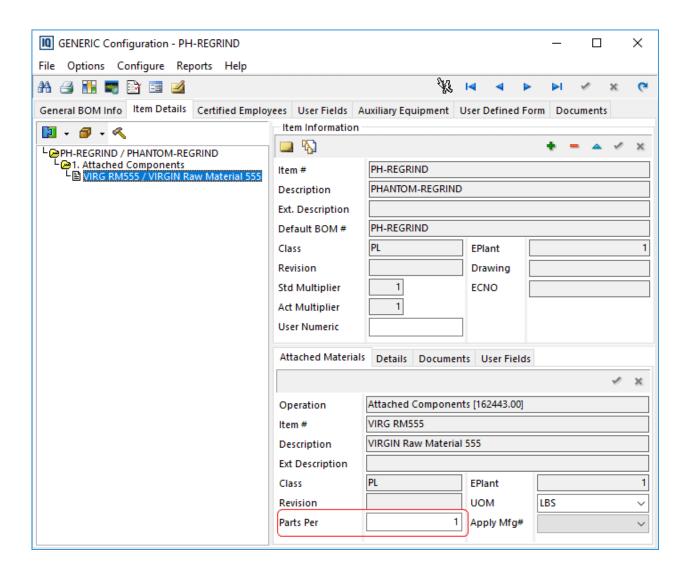**Note**: A top level item that is sold should not be marked as a phantom item.

The benefit of creating phantom items is the system will automatically know to consume the components if the phantom item inventory level is zero.

This technology can be used for blends that are set up as Generic BOM's. The system will pull from the existing on hand blend until it goes to zero, and then it will start pulling from the blend components.
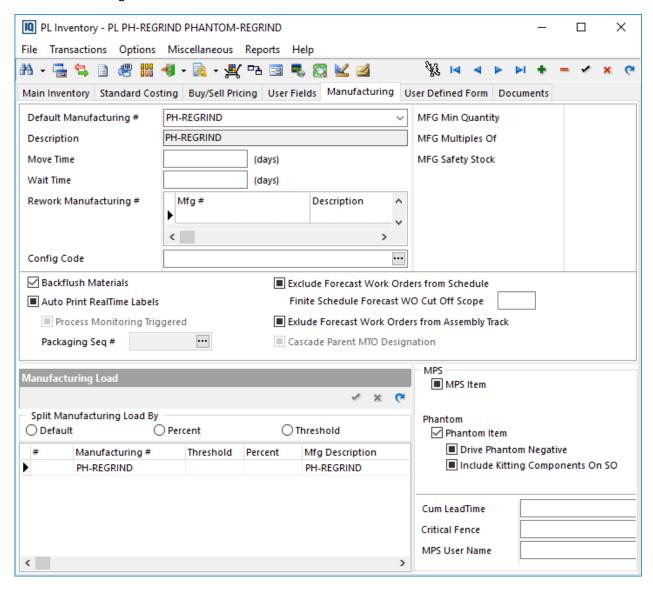
Regrind

To set up a phantom regrind:

1 Create a Generic BOM for the Regrind attaching the virgin raw material as a component at 1 per. Create the inventory item on the items detail tab as a PL class item.
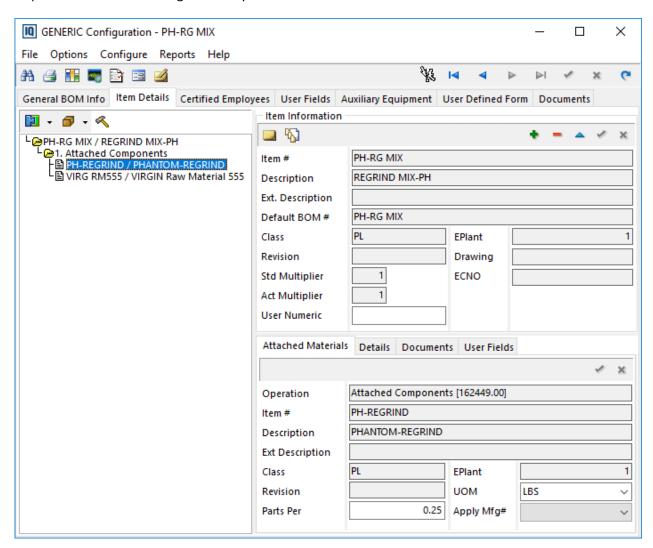
2 Jump to Inventory on the regrind item number and check the box "Phantom Item" on the Manufacturing tab.
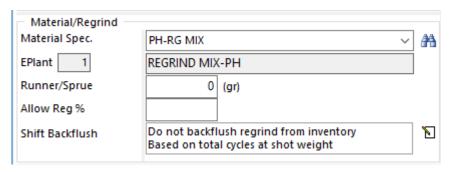

3 Create a Generic BOM for the Regrind mix. Make sure that the inventory item that represents the regrind mix on the items detail tab has an item class of PL.

4 As in step 2, jump to inventory and mark this item as a phantom on the Manufacturing tab.

5 In the item details tab, attach the Regrind BOM created in step 1 as a component at the regrind % used as parts per. (For example: if you are using 25% regrind - type .25 in the parts per field).

6 Next add the "virgin" material as a component using a parts per to equal the percent of virgin material used, i.e. .75.
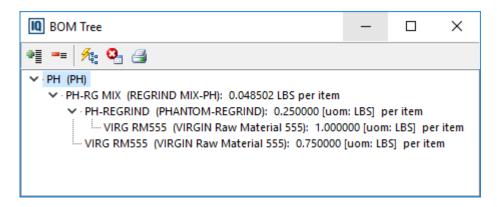
Note: If Manufacturing Cells are being used, all of the BOM's must be associated to a cell in order for the requirements to flow through correctly.
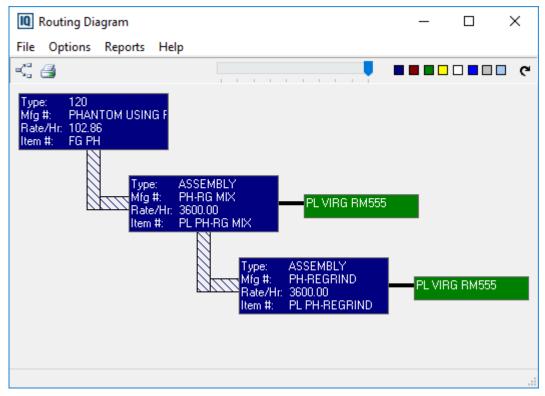

7   Attach the regrind mix PL item to the injection BOM that utilizes that material.

Below is an example of the BOM Tree and Routing Diagram for this set up.

Blend

If the resin used is a blend follow these steps:

1   Create a Generic BOM for the virgin blend. Create the inventory item on the items detail tab as a PL class item. Right click and jump to inventory to mark this item as a phantom in inventory. Attach the virgin raw material and the additive(s) as components at the % used in the parts per field. (i.e. the resin at .96 and the additive at .04).
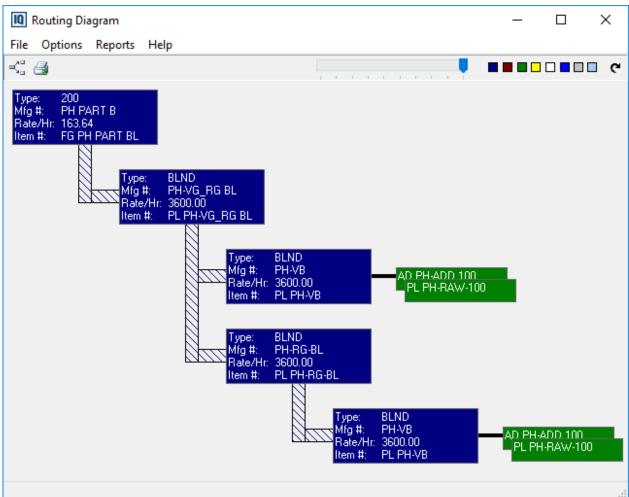
2   Create a Generic BOM for the regrind blend. Create the inventory item on the items detail tab as a PL class item. Right click and jump to inventory to mark this item as a phantom in inventory. Attach the virgin blend at 1 parts per.

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3 Create a Generic BOM for the Regrind mix. Create the inventory item on the items detail tab as a PL class item. Right click and jump to inventory to mark this item as a phantom in inventory. Attach the Regrind blend BOM as a component at the regrind % used as parts per. (For example. if you are using it a 25% - type .25 in the parts per field). Also add the virgin blend material as a component using a parts per to equal the percent of virgin material used, i.e. .75.

4 Attach the regrind blend mix PL item to the injection BOM that utilizes that material.

See below for an example:

Transactions

Inventory levels for raw materials will need to be maintained for all items using manual transactions and back flushing. Because the items are marked as phantoms no work orders are generated for them therefore production reporting is not used. For example when the regrind mix is blended a manual transaction with the back flush option checked is done. This ensures the on hand inventory levels for the regrind mix is accurate.

Production Reporting

When manufactured items are added to a production report the raw material usage will flow through based on current on hand inventory for the attached raw materials. An item will be consumed until the on hand goes to zero then it will use the next component.

Using the BOM Tree from below see the following examples:

Ex #1:

To produce 1000 items the required material is 220.463 lbs. (1000 x .220463).

On hand Inventory: PH-RX MIX = 100

PH-REGRIND = 0

The quantities dispositioned would be as follows:

	Class	Item#	Description	Qty	
	PL	PH-REGRIND	REGRIND - PHANTOM		
	PL	RM-555	RAW MATERIAL 555	120.4634	
▶	PL	PH-RG MIX	REGRIND MIX -PH	100.0000	

The system would use the 100 lbs of the regrind mix on hand and because there was not any regrind it would consume the rest in the virgin raw material component (RM-555) to equal the 220.463 lbs required.

Ex #2:

On hand Inventory: PH-RX MIX = 100

PH-REGRIND = 50

The quantities dispositioned would be as follows:

	Class	Item#	Description	Qty	
▶	PL	PH-RG MIX	REGRIND MIX -PH	100.0000	
	PL	PH-REGRIND	REGRIND - PHANTOM	30.1159	
	PL	RM-555	RAW MATERIAL 555	90.3476	

The system would use the 100 lbs of the regrind mix on hand. Then because there is enough regrind to make the proper mix the system will consume the regrind and the raw material at the 25% regrind requirement. (220.463 -100 = 120.4634; 120.4634 * .25 = 30.12)

Ex #3:

If there were only 20 lbs of the PH-REGRIND then the system would use all of that plus enough RM-555 to equal 120.4634 (100.4634).

	Class	Item#	Description	Qty
▶	PL	PH-RG MIX	REGRIND MIX -PH	100.0000
	PL	PH-REGRIND	REGRIND - PHANTOM	20.0000
	PL	RM-555	RAW MATERIAL 555	100.4634

Note: When using Phantom items and lot numbers, if the phantom item does not have lot number, the system will use the upper level items lot number for the translog entry. This ensures that the lot information will be available in the Lot Tracking module.

Material Planning

Material planning will first look for the on hand for the highest level material and if it is not enough it will go through the hierarchy to determine requirements. If there is not enough of the regrind mix or regrind it will tell the buyer to purchase more components (in this example more virgin plastic).

Examples:

Ex #1:

On hand Inventory: PH-RX MIX = 100

<div align="center">PH-REGRIND = 0</div>

<div align="center">RM-555 =0</div>

Material Exception List will show a requirement of 120.46 lbs of RM-555

Ex #2:

On hand Inventory: PH-RX MIX = 100

<div align="center">PH-REGRIND = 20</div>

<div align="center">RM-555 =0</div>

Material Exception List will show a requirement of 100.46 lbs of RM-555

Ex #3:

On hand Inventory: PH-RX MIX = 100

<div align="center">PH-REGRIND = 50</div>

<div align="center">RM-555 =0</div>

Material Exception List will show a requirement of 90.35 lbs of RM-555

Comparison of Phantom Blends to Inventory Blends

As an alternative to the usage of phantoms, blends can be created in the inventory module. The biggest difference is the system will not flow through the entire hierarchy to determine usage and requirements as it does with a phantom. However, the advantage of inventory blends is mostly in the set up as numerous BOM's will not have to be created.

When using Inventory blends the following logic applies:

If Blended at Work Center is checked:

- Material Planning - The system will not look at any blend on-hand, only the components. Only the components will show up in material exceptions.
- Dispositions - Only the blend components will be dispositioned. The blend itself will not ever be removed during dispositioning.

If Blended at Work Center is not checked:

- Material Planning - Material planning will first look at how much blend is on-hand and if there is not enough, the blend components will show on the material exceptions.
- Dispositions - Only the blend will be removed during dispositioning, never the components.

Two Shot Molding

Two Shot molding is basically treated as one shot. In two shot molding, every single shot, other than the very first shot, produces one finished part. Assuming the cycle time is 30 seconds, from the second shot on, a finished part is produced every 30 seconds, therefore the cycle time should be entered as the time for a single shot. If two materials are being used the user will need to create a blend operation, with the Blend at Work Center option selected, of the two materials in the right proportions of the two base resins.
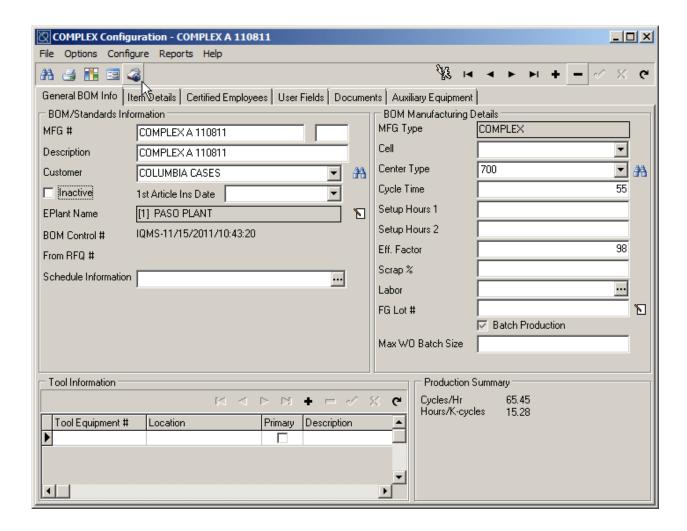
Complex MFG Type BOMs

Complex is a specific manufacturing type designed to simplify the scheduling process where multiple work orders are involved in producing a product, and the various operations are performed on multiple work centers that make up a complex line. When a Complex BOM is created all of the required BOMs are associated to the complex BOM, and those that are part of the complex line are designated as such. When the work order for the complex BOM is set up in the first position on the Complex Line,   the system will automatically set up the designated child work orders on the work centers associated to the Complex Line.

For more information on the set up and use of the Complex MFG Type please refer to the **Complex Manufacturing TechNote https://my.iqms.com/cfs-file.ashx/__key/Technote/Complex-MFG.pdf**.

The BOMS for the Complex MFG Type are similar to a Generic BOM. The only difference is that the additional BOMs are designated as part of the complex line using the graphical visual routing form.   In that screen you can right click to add the BOMs   and then designate them as part of the complex line.

To create a new Complex BOM, select the COMPLEX MFG Type from the selection criteria list. Enter the MFG # and other details based on the field listing for Generic BOMs (See General BOM Information for Generic BOMs for details).

Once the BOM is created select the 'Designate Complex Child BOMs' button at the top for the form to associate the BOMs required to manufacture the Complex item. A Complex Visual Routing diagram will appear showing the main level BOM as a blue box.

From this screen create or attach the child BOMs using the right click menu options. Use the' Add Routing BOM' to create new BOMs, use the 'Add Routing BOMs Like' to clone existing BOMs, or use 'Components' to associate existing BOMs.
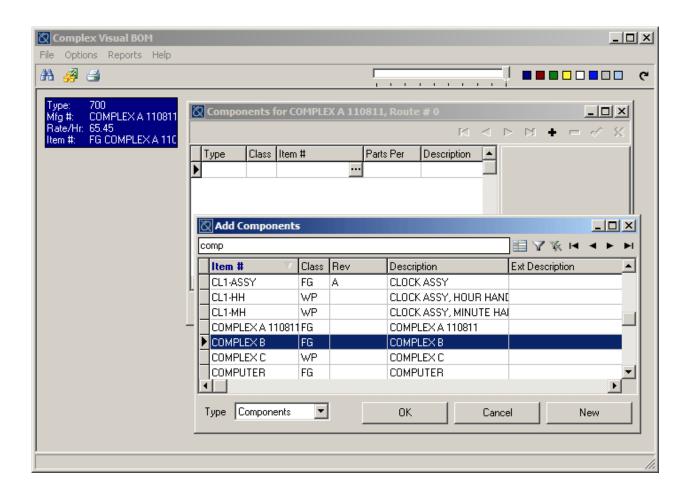
Note: A complex child can only have one parent. If a user must have two they need to clone the children also.

Add Routing BOM - To create new child BOMs, right click and choose Add Routing BOM. Choose the Mfg Type and cell (optional) then fill in the fields on the form with the information for the step. An unlimited number of child BOM can be created.

Add Routing BOM's Like - This option allows the user to 'clone' a BOM and add it to the routing diagram. After selecting this option a Routing Diagram pick list will appear. The user can double click on an item to view it's routing diagram. Once the desired step is found, drag the step(s) from the pick list and drop it onto the step it will follow in the visual routing diagram. A 'List of items to be cloned or reused' will appear. Enter the desired Mfg#, Item #, Rev, and Description.

NOTE: To add existing BOM's (not cloning) to the routing diagram use the Components option (discussed below) and select a FG or WP item as the component.

Components - This function enables you to add any components from your master inventory. After selecting this function a form will appear to add the components. Click in the Item # field and select the ellipsis button. The Add Components from will appear. To add FG or WIP items select 'Components' from the Type drop down list. Select the item from the list and enter the Parts Per, then select OK.

Designate the BOMs as Complex Mfg – If the attached BOMs are part of the complex manufacturing process, they must be designated as complex manufacturing. To do this, place the cursor on the blue box and use Ctrl + Left Click. A blue outline will be displayed around the Complex child BOM/routing box as shown below.

Additional Options:

Edit Routing BOM - This function brings up the BOM for editing purposes.

Delete Routing BOM - This function will delete the BOM Routing step you right clicked on and all of it's attached steps. This only removes the routing step(s) from the diagram it does not delete the BOM(s). A pop up screen asking if you are sure will appear. To delete the step(s) click on the Yes button.

Routing Notes - This brings up the Routing Notes for the routing step. This is a 2000 character note field used for work instructions for routings. This information will print on the Routing Packet report available in work orders.

Compound1

The Compound1 manufacturing type is used to create items with a unit of measure based on a weight such as grams or pounds.This manufacturing type is similar to Extrusion2 where there is a Lbs/Hr field, however there is no primary material. The item produced is made up of several components which also must have a weight type unit of measure. The components are assigned on the item details tab similar to the Masterbatch manufacturing type.

All of the fields are the same as described above (in General BOM Information for Generic BOM) except as noted below:

General BOM Info tab:

Lbs/Hr.	Required data. The amount of material (in pounds) that will be used every hour.

Assigning Components

There are three methods to assign the components: Assign Components by Percentage, Assign Components by Quantity, or Assign Batch Components by calculating unit quantity based on weighted average.

Assign Components by Percentage - Components are added by entering a percentage using this speed button. A form appears to associate all of the required components to produce the item.

From this form select the ADD (**+**) button and then click in the **Item #** field and select the ellipsis button. A pick list of inventory items with a primary material class will appear. Select the item from the list and enter the **Percent** required of this material. Only items with a weight type unit of measure are allowed to be selected. The **Qty Per** field is based on the manufactured items unit of measure. It is calculated based on the Percent. For example, the manufactured item has a UOM of LBS, the component item's UOM is KG with a Percent of 33%, the Qty Per will be 14.96847, (33 * 0.45359). Continue this process until all of the required components have been added. The Percent must total 100%.

Assign Components by Quantity - Select this button to enter the components by quantity and then calculate the percentages.

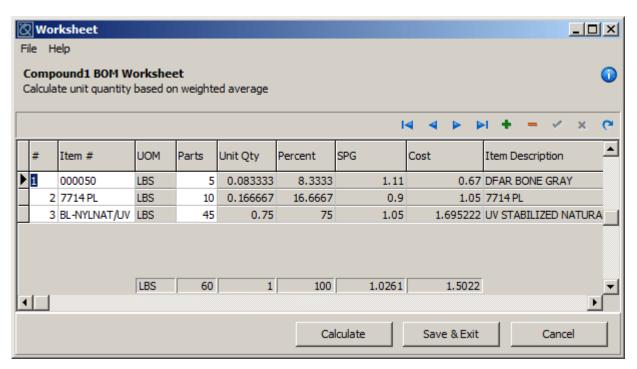from this form select the ADD (**+**) button and then click in the Item # field and select the ellipsis button. Select the item from the pick list and enter the **Qty Per Std**. Continue this process until all of the required components have been added. Select the **Calculate** button to have the system calculate the Percent. The Percent must total 100%.

Note: The Add Material, Change Material, and Delete Material options from the right-click menu are disabled for Compound1 components since only the BOM Worksheet should be used for making adjustments to Compound1 components.

Assign Batch Components by calculating unit quantity based on weighted average - Select this option to have the system calculate the unit quantity based on weighted average. The following form will appear:

#	Item #	UOM	Parts	Unit Qty	Percent	SPG	Cost	Item Description
1	000050	LBS	5	0.083333	8.3333	1.11	0.67	DFAR BONE GRAY
2	7714 PL	LBS	10	0.166667	16.6667	0.9	1.05	7714 PL
3	BL-NYLNAT/UV	LBS	45	0.75	75	1.05	1.695222	UV STABILIZED NATURA
		LBS	60	1	100	1.0261	1.5022	

Worksheet

File Help

Compound1 BOM Worksheet
Calculate unit quantity based on weighted average

Calculate   Save & Exit   Cancel

From this form users can add materials to be used for the batch. Select the insert record button to add a row then select the ellipsis button in the Item # field to access the inventory pick list. Enter the quantity in the Parts field.

Select the Calculate button to have the system perform the weighted average calculation. Following are the calculations with examples based on the third line in the above screen shot.

- Unit Qty = (Qty/SUM Qty)   45/60 = .75
- Percent = (Unit Qty*100)   0.75 * 100 = 75
- SPG Total = For each item Parts/SPG = D, then SPG Total field = SUM(Parts/D):   D = (5/1.11) + (10/0.9) + (45/1.05) = 58.4728; SPG Total = 60/58.4728 = 1.0261
- Cost Total = (SUM(Unit Qty*Cost))   (0.75 * 2.624762) + (0.083333 * 0.6672) + (0.166667 * 1.821101) = 2.3277

If changes are made recalculate by clicking the Calculate button.

Any changes made to the worksheet are reverted if Cancel is clicked.

Clicking Save & Exit on worksheet, saves the changes and updates the BOM.

Right click on an item and select 'Jump to Inventory' to open the inventory module for the item.

Extrusions - General BOM Information

The following information is specific to the Extrusion Manufacturing type. The sample below shows a completed configuration. This is the main entry screen for building a BOM for an Extrusion standard. It contains all of the standard information such as the customer, manufacturing type, line size, Feet/Lb, Lbs/Hr, materials, etc.

Extrusion MFG Types

There are three extrusion manufacturing types available in the system.

- Extrusion
- Extrusion2
- Extrusion3

The chart below describes some of the differences:

Type	Item	BOM Info.	Work Center	Typical UOM	RealTime	Prod. Rep.
EXT	Part Length	Feet/Lb and Lbs/Hr; RT Signal Rate recommended if the signal does not equal the part length	Line Size	Feet*	Feet to Go	Total Length
EXT2	Part Weight	Lbs/Hr; RT Signal Rate required for production reporting (RT is not required for EXT2)	Center Type	Lbs.	Lbs. to Go	Total Lbs.
EXT3	Part Weight	Lbs/Hr; No RT Signal Rate	Center Type	Eaches	Parts to Go	Total Parts

Note: Items manufactured with an EXT2 and EXT3 manufacturing type must have a weight UOM, and not 'eaches'.

Note: It is recommended that users use the default of Feet imperial UOM and not inches.   Inches causes a problem because the system converts from feet to inches by using factor of 83.33 (1/12 = .0833333333 indefinite) which could cause rounding issues.

Field Listing for Extrusion Standards

The following field listing details the information that is required for each extrusion configuration. The information in the field listing has been broken down into separate sections (corresponding with your screen) for easy reference. Use the field listing to familiarize yourself with the data fields prior to making any entries.

Note that one of the major differences between an Injection BOM and an Extrusion BOM is the way the rate of production is captured. An Injection BOM requests a Cycle Time, where an Extrusion BOM requests a Feet per Lb value and a Lbs/Hr value. Taken together, EnterpriseIQ can generate a valid rate of production.

BOM/Standards Info

Mfg #	Up to 50 characters can be entered in this field. The number entered here is the number of the actual standard. Each configuration number and routing number combination must be unique. If the user enters a Mfg #/Routing # combination that already exists, a prompt will be issued informing that a duplicate number was entered. The user will need to reenter a new Mfg or routing number. Note: To view the STANDARD ID for the BOM select the Alt F1 keys and a pop up will display the ID (for example, Table = IQMS.STANDARD, ID = 46825).
Routing Seq #	This field can be used for informational purposes to define the routing step sequence of the BOM when there are several steps. This field displays in the BOM pick list.
Customer	This is not a required field, but is often used to associate a job with a particular customer. If you are a proprietary producer, you may leave this blank or list your company as the owner. To select a customer, type in the first couple of letters of the customer's name and the system will hyperbrowse to that customer. Another method is to select the customer from the pick list near the customer field.
From RFQ #:	The information displayed here originates from the Quote module and will only be present if the standard was converted from a Quote. This field cannot be edited.
BOM Control #	The BOM Control number will change automatically when someone makes a change to the configuration. This field cannot be edited. This field will not update immediately. In order to see the change, the user would have to exit the BOM module and come back in. The field consists of today's date, time and **EnterpriseIQ** user ID of the person who made the change.
Schedule Info	The user can enter up to 250 characters of information that will display when a work order is scheduled to a work center that uses this BOM. The information can be printed using the Print button from the BOM or from the schedule.
EPlant Name	This field is used to designate the configuration to a specific EPlant. It is not a required field if EPlant is not being used.

Inactive	A BOM can be marked inactive. This will 'hide' the BOM from pick lists. To view an inactive BOM the pick lists have a new button in the upper right corner to 'view inactive' items.
1st Article Ins Date	Enter the First Article Inspection date using the drop down calendar (Optional). This is the date that the configuration was first approved for use in a production run. This field is for information purposes only. This field description can also be changed by right clicking on the field and selecting the Define Label Text option. Enter in a user defined caption in the New Value field. The customized caption is based on Manufacturing Type. If the caption is changed for an Injection BOM, all of the Injection BOM's will have that same caption but not other types of BOM's such as Generic.

Material/Regrind

Material Spec.	This field is used for selecting the material that will be used for this job. This section has two fields--one will list the material item number and the other will fill in with the description. The user can "Jump to Inventory" by right clicking of the material description field. Use the Jump To function to make changes to that item, check quantities on hand, etc. For information on defining blends, please **Defining a New Blend Operation**. **Note**: For EXT2 BOMs, the Primary Material should not be an item created from a Generic Bom. If it is a blended material it should be added to the item details tab instead. This will prevent an off balance in Post Inventory Transactions.
EPlant	The EPlant information associated with the material.
RT Signal Rate	**Recommended for Extrusion, Required for Extrusion 2, Not a field for Extrusion3**. Set the RealTime Signal Rate to the number of feet or pounds produced within the RT Signal time. The system uses this field to calculate the Total Length (Extrusion) or Total Lbs (Extrusion 2) for production reporting. The calculation is Total Cycles x RT Signal Rate. **Notes**: ▪ This is required for the Extrusion Mfg Type when the part length is different than where RealTime receives the signal. ▪ This field must be filled in if using the `Dispo by Cycles' option on the Item Details tab for attached components. ▪ Always required for the Extrusion 2 Mfg Type.
Allowable Regrind%	This field is used to enter the amount of allowable regrind that can be used for this job. **EnterpriseIQ** will assume regrind consumption up to this amount, if the job will generate that much. This field is used in the calculation for Lbs/K (does not apply to EXT), and is related to the Disposition Regrind option below.

Shift Backflush	This field determines how the material will be dispositioned (backflushed) at the time of production reporting. To access the screen click on the [icon] Edit Shift Backflush Parameters button. There are three options: **Total Cycles at Shot Weight** - This is the default method. The system will calculate total cycles at total shot weight for the raw material usage. **Total Cycles at Part Weight** - If this option is checked the system will calculate the total cycles at part weight. The runner and sprue are not included in the calculation for raw material usage.
	Notes: Since there is not a value for a runner and sprue on an Extrusion BOM the first two options are essentially identical. This option is not available on EXT2 BOMs.
	Good Parts Only at Part Weight - If this option is checked the system will calculate the good parts only at part weight for the raw material usage. **Regrind Option**: If the user selects this option, the program will backflush from the regrind on hand based on the amount entered in the Allow Regrind% field. During dispositions, the program will reduce the amount of virgin material used by the quantity of regrind. This question has NO EFFECT on the total amount of material used. **Example 1**: Leave the box un-checked: During dispositioning, the program calculates that you used 100 lbs of material. 100 lbs of virgin material and 0 lbs of regrind will be relieved from inventory. **Example 2**: Check the box: During dispositioning, the program calculates that you used 100 lbs of material. At 20% regrind, 80 lbs of virgin material and 20 lbs of regrind will be relieved from inventory. If you have no regrind in the inventory file, the regrind amount will go negative.

BOM Manufacturing Details

Mfg. Type	This field shows the TYPE of manufacturing this standard will be used for. Cannot be edited.
Cell	Manufacturing Cells are associated to specific MFG Types and are used to designate separate areas in your facility. Manufacturing Cells allow a logical grouping of work centers. Group work centers by location, product line, process, etc… for separate scheduling and production reporting. Cells are discussed in the Setup Manual under **Manufacturing Cells**. Refer to that section for more information.
Line Size (Extrusion) or **Center Type (Extrusion2 & Extrusion3)**	The field information displayed is based on the TYPE field in the Work Center module. The Line Size is the measurement (or diameter) of the extruder barrel. The machine scheduling portion of **EnterpriseIQ** will group production jobs together according to the line size, though you can override this behavior.

Feet/Lbs	**Required field for Extrusion Mfg Type**. The number of feet generated for every pound of material. (This field is not on the Extrusion 2 or Extrusion 3 manufacturing type BOM's). Note: It is recommended that users use the default of Feet imperial UOM and not inches. Inches causes a problem because the system converts from feet to inches by using factor of 83.33 (1/12 = .0833333333 indefinite) which could cause rounding issues.
Lbs/Hr.	**Required data**. The amount of material (in pounds) that will be used every hour.
Labor	This is the labor required at the press to run this operation. This field is used to compute the labor hours required to complete the work order. To enter the required labor click on the ellipsis button in the labor field and the following form will appear: From this screen click on the **ADD (+)** button, enter in the quantity of operators required (this does not have to be a whole number) then select the Employee Level Code from the drop down list. The Labor Rate will fill in with the rate associated with the code. The user can select multiple labor codes and associate fractions of operators per code or multiple operators per code. **EnterpriseIQ** supports a range of 0.00 to 999 operators per job. A number less than 1 can be used for jobs running automatically and an operator is not always at the press. For these tools, a partial number such as 0.5 is entered depending upon the number of machines the operator is tending. The Employee Levels list is created in Sys Setup->System Parameters->Lists. An unlimited number of employee levels may be created for use in the BOM module. The system comes with a Default labor code. If the Default labor code is selected the system will use the labor rate associated with the specific BOM (BOM->Options->Misc Parameters->Labor tab). If that is blank it will use the labor associated with the Manufacturing Cell. If the cell does not have a labor rate associated with it the system will use the labor rate associated with the Manufacturing Type.
SetUp Hours 1	This is the typical time in hours required to set up the tool. Use a close estimate, but remember that it could vary from time to time based on the previous job. The schedule will add this amount of time to each work order, or bucket, for this configuration. This field can also be used to determine the set up cost portion for a manufactured item. Setup Labor can be broken out on the standard cost of a manufactured item. This option must be turned on in system parameters (**Sys Setup->System Parameters->Inv Setup tab**). When activated, the user can add a cost element and type to an employee level. There are two supported types: Setup and Production. When the standard cost is calculated the system will check to see if this option is on and if so will break out the labor costs to the cost elements attached to any employee levels on the BOM. For "Production" types, the calculation will remain as is. For "Setup" types, the system will look at the number of setup hours 1 on the BOM times the number of operators for that type times the rate for the employee level divided by the standard run qty. Please see the Standard Cost section or the Inventory section for more information on the standard set up cost.

SetUp Hours 2	This field is used in the schedule when the same tool is running consecutively in a machine instead of Setup Hours 1. If the same tool is running back to back in a work center the Setup Hours 2 value will be used instead of Setup Hours 1. For example, this value can be set to zero and if the same tool will be running back to back the schedule will not add the set up to the schedule which will provide a more accurate end time for the job.
Scrap%	This is the estimated amount of scrap that the production process itself will generate. This is used in calculating the extra production time and extra material you will need.
	Because each configuration can have it's own scrap rate, you should not include any other anticipated scrap usage here. **EnterpriseIQ** will calculate the total of all the rates and add the yielded scrap back into the job prior to production.
	Note: The system will include the scrap % in the work order lbs/kgs required field.
UOM	Unit of Measurement (i.e. feet, inches, meters, yards). This UOM defaults to the UOM set up in the **Quote** module under **Misc/Rates and Parameters**.
Eff. Factor	You can adjust the total time required to produce the part with this field. Enter an efficiency factor that accounts for production problems that effect overall performance.
	Entries made here will affect the Net Feet/hr and Feet/K fields in the Production Summary.
	This field is used to calculate the *assumed* production time.
FG Lot #	This selection allows the user to assign a Finished Goods lot number to the configuration. For additional information on this field, please see Finished Goods Lot Number.
Assy @ Mach.	This option should only be checked when setting up an assembly at the press configuration, where you need more than one produced part to make the final assembly. For example, if it takes two cycles to make enough parts to create the actual part number, click this option.This changes the terminology on the Item Detail page from Cavities to Multiplier. The multiplier can be set to.5 of a part. This means that only half of the part is made each cycle. With this knowledge, EnterpriseIQ understands that it will take 1000 cycles to make 500 parts

Production Summary - Extrusion MFG Types

Production Summary for the Extrusion **MFG Type**

Inches/Min	Shows the number of inches that will be produced per minute. Automatically calculated from the information entered when you set up the configuration.
	[((Feet/Lb * 12) * Lbs/Hr)/60]
Length (ft)	Shows the total length of the part being produced. This information comes from the Parts / Operation Details screen.

Feet/Hr	This field shows how many feet will be generated in one hour. It is automatically calculated by taking Feet/Lb times the Lbs/hr.
Net Feet/Hr.	This field shows the approximate GOOD feet/hr based on estimated scrap and/or the Efficiency Factor. This value is used to determine the total time this job will require. The calculation is as follows: Net Feet/Hr = (Feet/hr * (1-scrap)) * Eff Factor
Lbs/K Items	The number of pounds of material that it takes to complete 1,000 items and is calculated by the system. **Calculation**: ((Part Length divided by Feet per Lb) / (1- Scrap%)) x 1000

Production Summary for the Extrusion2 **MFG Type**

Hours/K-parts	This value displays the number of hours required to complete 1000 parts. It is based on the Lbs per hour and Lbs/K. It is calculated: Lbs per K / Lbs per Hour / (1-Scrap Rate percentage) Assume 20 pounds per hour Scrap = 10% Lbs/K =200 (200/ 20) / (1-0.10) = 11.11 Hours per 1000 parts
Net Hours/K-parts	This is the net hours per 1000 parts. This formula takes into consideration the efficiency factor. It is calculated: (Lbs per K / Lbs per Hour) / (1-Scrap Rate percentage) / (Efficiency Factor) Using the above example and an efficiency factor of 90%: (200/20) /(1-0.10) / (0.90) = 12.35 hours per 1000 parts

Lbs/K Items	The number of pounds of material that it takes to complete 1,000 items.
	With no scrap or regrind the formula is:
	Part weight(s) converted to pounds * 1000
	With scrap and regrind % equal to or greater than the scrap % the formula is:
	((Part weight in lbs. x 1000) / (1- scrap%))
	If the Regrind % is less than the Scrap % then the formula is:
	((Part weight in lbs.* 1000) / (1- scrap%) * 1 - Regrind %
	Example:
	Part Weight = 40 grams
	Scrap = 10%
	Regrind = 5%
	40/453.6 = .08818 lbs.
	(((0.08818 * 1000) / (1-.1)) * (1-.05))
	93.078

Production Summary for the Extrusion3 **MFG Type**

Hours/K-parts	This value displays the number of hours required to complete 1000 parts. It is based on the Lbs per hour and Lbs/K.
	It is calculated: Lbs per K / Lbs per Hour
	Assume 20 pounds per hour
	Lbs/K = 88.19
	88.19 / 20 = 4.41 Hours per 1000 parts.

Lbs/K Items	The number of pounds of material that it takes to complete 1,000 items.
	With no scrap or regrind the formula is:
	Part weight(s) converted to pounds * 1000
	With scrap and regrind % equal to or greater than the scrap % the formula is:
	((Part weight in lbs. x 1000) / (1- scrap%))
	If the Regrind % is less than the Scrap % then the formula is:
	((Part weight in lbs.* 1000) / (1- scrap%) * 1 - Regrind %
	Example:
	Part Weight = 40 grams
	Scrap = 10%
	Regrind = 5%
	40/453.6 = .08818 lbs.
	(((0.08818 * 1000) / (1-.1)) * (1-.05))
	93.078

All other functions within the Extrusion BOM, such as adding items, attaching components and packaging, linking documents and auxiliary equipment, are identical to the Injection BOM, explained earlier in this chapter.

Keep in mind the item information differences for the different extrusion manufacturing types. Extrusion is entered as a part length, Extrusion 2 and Extrusion 3 are entered as a part weight.

Generic Standards

Generic Standards are used by **EnterpriseIQ** when an operation or process needs to be defined that does not fit the Injection, Extrusion or other manufacturing types. Like other standards, generics can consume finished goods, components, and packaging, and can include labor and overhead.

Like all standards in **EnterpriseIQ**, a generic BOM can be the basis for a work order which can be scheduled on a work center.

Like other standards, Generics contain the basic information about how a part is made. The key difference is in the general information area. Generics, for example, do not maintain a material specification on the header level, like an injection standard would. Instead, a generic standard consumes one or more components as part of the make up of the final part number the generic standard creates. Generic standards are very versatile. Use a Generic standard to "track" or "link" various operations and parts together to create a finished good.

An Example of Using a Generic Standard

Assume the final part number 123-456 is actually made up of two manufactured parts and requires those parts to be heat sealed together. To complete this assembly, the user would create the individual mold standards for the two components. Then, using a generic standard, "consume" the two parts during the heat sealing operation, creating the final part number in the process.

In the end, part number 123-456 is made up of three standards - two for the manufactured parts, one for the final assembly. **EnterpriseIQ** supports the scheduling of all three jobs.

Example:

Injection BOM #1 creates Part A only

Injection BOM# 2 creates Part B only

Generic BOM #1 creates Part 123-456. This is the only part number the BOM creates, so it is entered as the main part number in the **Item Detail** screen.

As described above, the Generic BOM is actually describing the process that makes part number 123-456. This part number is actually a combination of parts A and B. Therefore, the Generic BOM must also *consume* parts A and B.

Create this link by adding Components to Part 123-456. Click on the Add Components button (or right click and select Add Component), and select Part A from the pick list. Repeat this process for Part B. Note that you can add other components at this operational level, and you can add packaging.
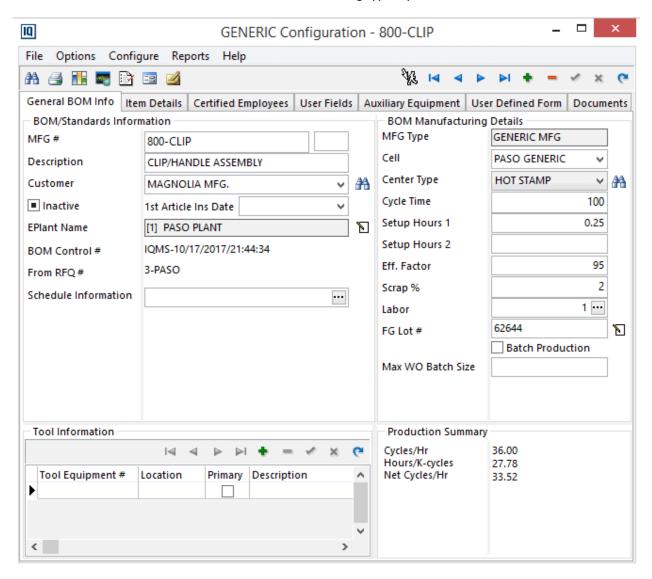
The final Generic BOM now indicates to **EnterpriseIQ** that for every part number 123-456 created, parts A and B are consumed.

Note: The Assembly MFG Types (ASSY1, ASSY2,and ASSY3) are also very useful for assembly type operations. Please see the Assembly Manufacturing documentation for details.

Note: There is also an 'Assembly' MFG Type available that conforms to the Generic MFG Type except the cycle time defaults to hours instead of seconds.

General BOM Information for Generic BOMs

The following information is specific to the generic standard only. The sample below shows a completed generic configuration. This is the main entry screen for building a BOM for a generic standard. It contains all of the information such as the customer, manufacturing type, cycle time, and more.

The following field listing details the information that is required for building each Generic configuration. The information in the field listing has been broken down into separate sections (corresponding with your screen) for easy reference. Use the field listing to familiarize yourself with each data field prior to making any entries.

Field Listings

BOM/Standards Info

Mfg #	Up to 50 characters can be entered in this field. The number entered here is the number of the actual standard.
	Each configuration number and routing number combination must be unique. If the user enters a Mfg #/Routing # combination that already exists, a prompt will be issued informing that a duplicate number was entered. The user will need to reenter a new Mfg or routing number.
	Note: To view the STANDARD ID for the BOM select the Alt F1 keys and a pop up will display the ID (for example, Table = IQMS.STANDARD, ID = 46825).
Routing Seq #	This field can be used for informational purposes to define the routing step sequence of the BOM when there are several steps. This field displays in the BOM pick list.
Description	Description of the Generic BOM. Typically describes the part and process. Enter a description for this standard that describes the type of operation required (i.e. hot stamp, heat treat, engrave, assemble parts, etc.)
Customer	Type in the first couple of letters of the customer's name and the system will hyperbrowse to that customer. Another method is to select the customer from the pick list. This is not a required field, but is often used to associate a job with a particular customer.
	If you are a proprietary producer, you may leave this blank or list your company as the owner.
Inactive	A BOM can be marked inactive. This will 'hide' the BOM from pick lists. To view an inactive BOM the pick lists have a new button in the upper right corner to 'view inactive' items.
1st Article Ins Date	Enter the First Article Inspection date using the drop down calendar (Optional). This is the date that the configuration was first approved for use in a production run. This field is for information purposes only.
	This field description can also be changed by right clicking on the field and selecting the Define Label Text option. Enter in a user defined caption in the New Value field. The customized caption is based on Manufacturing Type. If the caption is changed for an Injection BOM, all of the Injection BOM's will have that same caption but not other types of BOM's such as Generic.
EPlant Name	This field is used to designate the configuration to a specific EPlant. It is not a required field if EPlant is not being used.

BOM Control #	The BOM Control number will change automatically when someone makes a change to the configuration. This field cannot be edited. This field will not update immediately. In order to see the change, the user would have to exit the BOM module and come back in.
	The field consists of today's date, time and **EnterpriseIQ** user ID of the person who made the change.
	Note: Changing the Lot Number will not update the BOM Control Number.
From RFQ #:	The information displayed here originates from the Quote module and will only be present if the standard was converted from a Quote. When a value is present the user can right click and jump to the quote. The quote the system will jump to is based on the quote ID associated to the standard.
	To change the quote the BOM is linked to, right click and select 'Edit RFQ Jump'. A pick list of quotes that exist for the same item number will appear to choose from.
Schedule Info	The user can enter up to 250 characters of information that will display when a work order is scheduled to a work center that uses this BOM. The information can be printed using the Print button from the BOM or from the schedule.

BOM Manufacturing Details

Mfg. Type	This field shows the TYPE of manufacturing this standard will be used for.
Cell	Manufacturing Cells are associated to specific MFG Types and are used to designate separate areas in your facility. Manufacturing Cells allow a logical grouping of work centers. Group work centers by location, product line, process, etc… for separate scheduling and production reporting.
	Cells are discussed in the Setup Manual under Manufacturing Cells. Refer to that section for more information.
Batch Production	Batch production should be checked when the process is done in batches. For example, oven or sterilization processes. It is used in situations where it will take the same amount of time to do one item as it would take to do an entire batch of items. The maximum batch quantity is to be entered in the Std and Act Multiplier fields on the Item Details tab.
	Note: The 'Max WO Batch Size' setting is not the size of the batch for use with this Batch Production option. See below for details on that option.
	Note: When this option is checked the consumed materials in material exceptions will be required upfront and produced parts will be projected to be available on the last day of run.

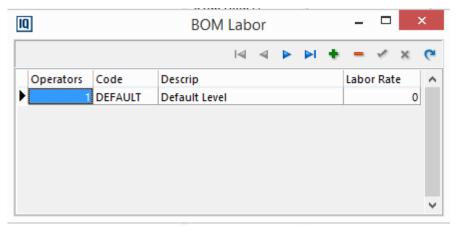|	
Center Type	**Required Field.** The entry here is based on the TYPE field in the Work Center module. The drop down list will be for work centers with the Generic manufacturing type only. This field links the job to a particular type of work center, though it does not necessarily link it to any one specific work center. Conceptually, **EnterpriseIQ** needs to know what kind of work center is used in the production of the items. It does not need to know specifically which work center. Assigning a specific work center is done during scheduling, where the user will have many options when placing the job in a particular work center queue. The machine scheduling portion of **EnterpriseIQ** will group production jobs together according to the type, though the user can override this behavior
Labor	This is the labor required at the work center to run the configuration. This field is used to compute the labor hours required to complete the work order. To enter the required labor click on the ellipsis button in the labor field and the following form will appear:

	From this screen click on the **ADD (+)** button, enter in the quantity of operators required (this does not have to be a whole number) then select the Employee Level Code from the drop down list. The Labor Rate will fill in with the rate associated with the code. The user can select multiple labor codes. **EnterpriseIQ** supports a range of 0.00 to 999 operators per job. A number less than 1 can be used for jobs running automatically and an operator is not always at the press. For these tools, a partial number such as 0.5 is entered depending upon the number of machines the operator is tending. The Employee Levels list is created in Sys Setup/System Parameters/Lists. An unlimited number of employee levels may be created for use in the BOM module. The system comes with a Default labor code. If the Default labor code is selected the system will use the labor rate associated with the specific BOM (BOM/Options/Misc Parameters/Labor tab). If that is blank it will use the labor associated with the Manufacturing Cell. If the cell does not have a labor rate associated with it the system will use the labor rate associated with the Manufacturing Type. **NOTE**: If the BOM is converted from a quote or cloned from another BOM, the labor will be assigned to the Default labor code.
SetUp Hours 1	How long does it take (in hours) to setup the work center to perform this operation.

SetUp Hours 2	This field is used in the schedule when the same tool is running consecutively in a machine instead of Setup Hours 1. If the same tool is running back to back in a work center the Setup Hours 2 value will be used instead of Setup Hours 1.
Cycle Time	Required field. Enter in the length of time that it takes to complete a cycle. As mentioned, a cycle might make one, many, or a fractional amount of the final part. The unit of measure defaults to seconds.
	In a Generic BOM, a cycle is the amount of time it takes to complete a single operation, such as pad print, die cut or heat seal. For example, if it takes 30 seconds to pad print the item, then enter 30. You can adjust the number of parts printed per cycle by using the multiplier on the Item Detail page.
Efficiency Factor	You can adjust the total time required to produce the part with this field. Enter an efficiency factor that accounts for production problems that effect overall performance.
	This field is used to calculate the assumed production time.
Scrap%	Enter in how much percentage of scrap that you anticipate will occur when performing this operation. This value will only affect the amount of time it will take to run the item(s). It does not affect attached material on the Item Details tab. There is a separate scrap field for attached items.
FG Lot #	This selection allows the user to assign a Finished Goods lot number to the configuration. For additional information on this field, please see Finished Goods Lot number section for additional information.
Max WO Batch Size	Enter the maximum work order batch size if desired. This will break up the sales order releases into multiple buckets if necessary on the work order(s). For example: The sales order release is 2000 pieces, and the Max WO Batch is 500. Assuming zero on hand the system will create four work orders for 500 pieces each.
	Note: This setting is not the size of the batch for use with the Batch Production option.
	Note: Similar to the Inventory setting MFG Min Quantity, entering a value in this field will create a separate work order for each release quantity.

Production Summary

Cycle/Hr	The system takes the number of seconds in an hour and divides it by the cycle time to calculate the number of cycles/hr. Shows how many parts will be assembled in an hour.
	Calculation: 3600 / Cycle Time = Cycles/Hr.
Hours/K Cycles	This value displays the number of hours that it takes to complete 1000 operational cycles. Each cycle may produce one or many actual parts, depending on the operation itself. The calculation is based on Gross cycles per hour, not Net cycles.
	Calculation:
	Assume **Cycles/Hr** is 60 **Hours/K Cycles** = 1000 / 60 = **16.67 Hours**

Net Cycles/Hr	The total number of assumed or net cycles that will be generated in an hour. This field is calculated by taking the number of seconds in an hour and dividing it by the cycle time, and then factoring in the scrap rate and the efficiency factor. This is the value used by the Work Order system to generate the total length of time required to manufacture the part(s).
	Calculation:
	Net Cycles/Hr = (3600 / (cycle Time))(1-Scrap Rate percentage)(Efficiency Factor)

All other functions within the Generic BOM, such as adding items, attaching components and packaging, linking documents and auxiliary equipment, are identical to the Injection BOM, explained earlier in this chapter. The one difference is the Apply Mfg# drop down box.

Note: When a user creates a User Defined Form field and grants security to that UDF field, if the UDF field is deleted the security to the field is removed. If the UDF field is re-added with the same name, security will need to be reestablished for users.

Apply Mfg

The Apply Mfg # field on the Item Details tab allows for simultaneous or parallel scheduling of an injection job and a generic job. This is used if you are doing an assembly at the press but want to track the FG items separately. By applying the injection BOM that correlates with the generic you will create a line item for both on the RealTime™ production report with the corresponding lot number information (if applicable) for each based on the individual BOM's. The work order for the generic job will only be automatically added to the production report if RealTime™ is being used. For this to function properly the cycle time, set up hours, efficiency factor, and scrap % for the generic BOM should be identical to the injection BOM.

Note: It is recommended that material requirements (PK, IN, etc.) are attached to the Injection work order to make sure material planning, usage, and staging reports are accurate.

Note: Material should not be attached to the Generic BOM when using the 'Apply Mfg #' option because the work order for the Generic BOM is not actually scheduled. If there is a material requirement associated to the Generic work order, because it is not scheduled the material exception and usage reports would be based on the must start date (as you do not ever get an actual start date). Also, because the generic is not scheduled on a machine, the material requirements would not show up on the staging reports as the staging reports are only looking at scheduled work orders.

Note: If both the work order for the Generic BOM and the manufactured injection item is scheduled, the user will not see material requirements for any attached components. The system will ignore attached components due to both work orders being scheduled, when only one should be.

Note: Even though this requires RealTime™ for this option to create a production report line for the Generic work order, it will not be visible in RealTime™.

Kitting

A user defined MFG Type can be created to handle configurations where multiple items are shipped as a kit. The kit item is created as a phantom item. When the kit item is added to a sales order the system will create requirements for the components, and typically just the components are picked for shipping. The kit item will be listed on the packing slip with the components that make up the kit listed in an indented format. The invoice will list the kit item and the components, but by default only the Kit item displays a unit price (it displays zero for the components).

Note: If the 'Include Kitting Components on SO' and the 'Price Based on Components/Modify Components' options are checked for the Kit item (inventory->Manufacturing tab), when a KIT is added to a Sales Order, the unit price of the phantom item will be null and the unit prices of the components will populate instead.

Creating the Kitting BOM

Create Kitting MFG Type

The first step is to create a user defined MFG Type using the Generic type as the 'Default To' type. From MFG Types select the insert record button and from the User Defined tab enter the Mfg Type name and select Generic as the default. The phantom kit item should not have labor and overhead costs associated to it for standard costing purposes (see the standard cost note at the bottom of this section), therefore the Labor rate should be zero.

Note: Creating a new MFG Type specifically for Kitting is optional, the Generic MFG Type can be used.

 (Please see Modifying   Manufacturing Types for a complete discussion on creating MFG Types).
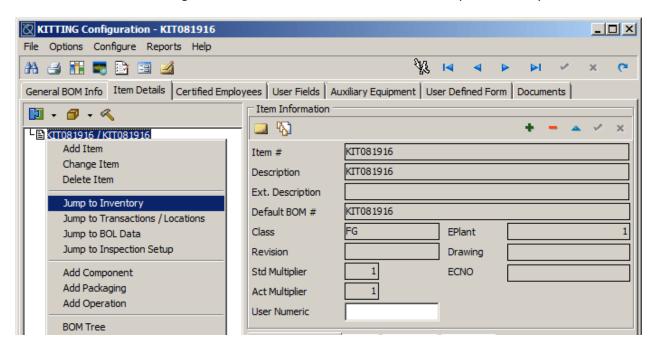
Create Kitting Work Center(s)

At least one work center must be created for the Kitting MFG Type. For standard costing purposes the overhead should be zero.

Create the Kitting BOM

Next, create the BOM using the new MFG Type just created. If adding labor, be sure that the cost is zero for standard costing purposes. (Refer to the section on *Generic Standards* for more information).

On the Item Details tab add the kit item. The inventory item that is the complete kit must be marked as a Phantom item. To do this, right click on the item in the tree and select Jump to Inventory.
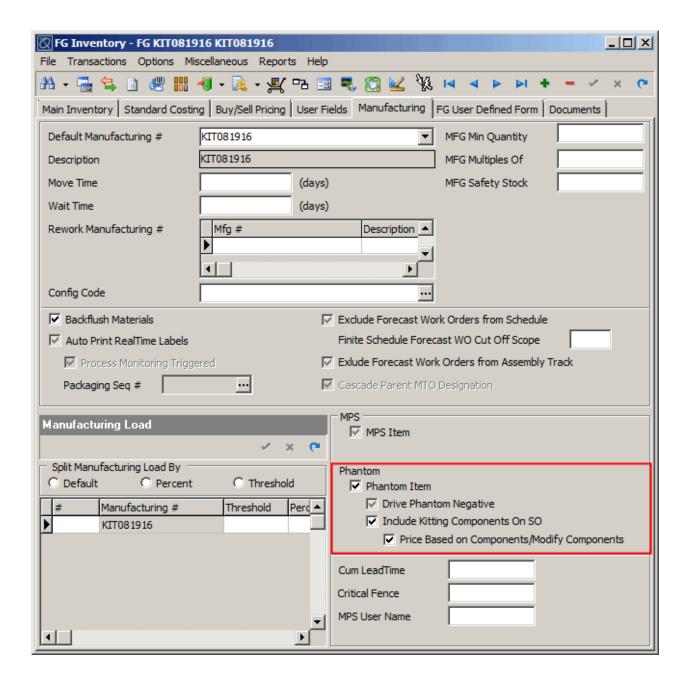
From the Manufacturing tab in master inventory select the '**Phantom Item**' check box. With this box checked the system will only remove the attached components when shipping the kit to the customer.

Also check the '**Include Kitting Components on SO**' box if you want to ensure the components of the kit will automatically be added to the sales order. When this is checked, if the Must Ship Date is changed on the Parent Item, the change will carry through to the components like it does when changing the Promise date.

Additional Option:

Price Based on Components/Modify Components - This check box is only visible if the 'Include Kitting Components on SO' is checked. If this is checked, when a KIT is added to a Sales Order, the unit price of the phantom item will be null. The unit prices of the components will populate instead. The component pricing will follow normal pricing rules (e.g. pricing hierarchy, discounts/markups, etc). When the kit is added to a sales order or AR invoice, users are not allowed to delete kit components from the kit, and are prevented from modifying the kit components' quantity. When a packing slip is invoiced in the AR module, the components listed on the packing slip will appear on the Invoice. The price of the phantom will remain suppressed and the prices of the components will remain populated.

Note: A phantom Kit item is a top-level item, and when selected to ship (instead of the components), this will drive the phantom Kit item negative regardless of 'Drive Phantom Negative' check box selection.
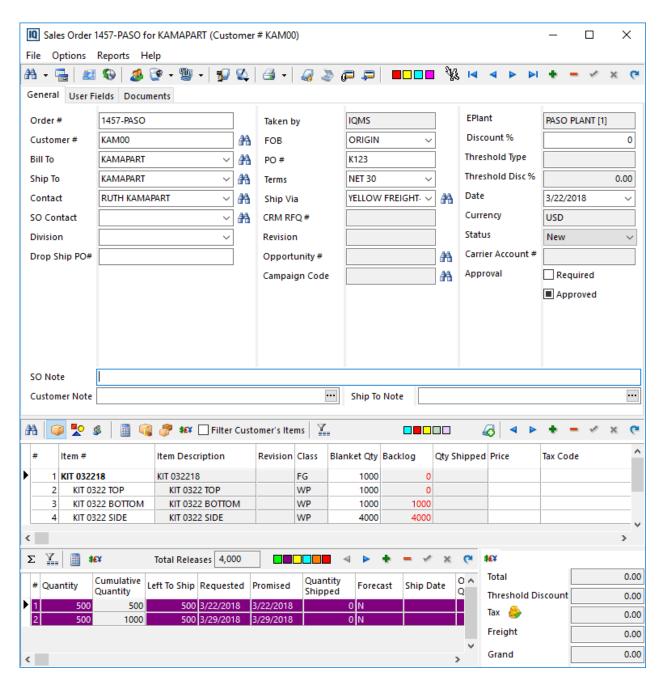
Next, add the components to the BOM that make up the kit using the Add Component speed button and selecting the kit items from the pick list. Enter the components per part and any other required details. (See Attaching Components for more information).

Note: Kits cannot be added as components to existing BOMs that make a Kit ('Sub-Kits' are not allowed). If users attempt to add a kit item on the item Details tab of a Kitting BOM a message will appear stating, 'A Kit cannot be a component on a BOM that makes a Kit – operation cancelled.' This message will also appear when selecting the check box to 'Include Kitting Components on SO', if the item is currently a component on a BOM that makes a Kit, or is a manufactured item that includes a component that is a Kit.

When the BOM is for a Kit item, there is an additional option for the components of the kit on the Attached Material Details tab in the General section called **Exclude from KIT MTO**. When this option is checked the system will exclude the component from inheriting the Make To Order (MTO) status of the phantom Kit item on the sales order.   This will ensure that users will not be forced to select only a MTO location for the components when creating a pick ticket. Note: This option can be checked for any component of a phantom (purchased or manufactured), however it only applies if the main phantom item has the check box in Inventory to 'Include Kit Components on SO' checked. For non-Kit phantom items, since components are not included on a sales order they do not automatically inherit the MTO status.

Note: With the 'Exclude from KIT MTO' option selected on a manufactured component of a phantom item that also has the option 'Cascade Parent MTO Designation' selected in Inventory (Manufacturing tab), the 'Exclude from Kit MTO' option in the BOM module overrides this and the component will NOT be marked MTO on the sales order.

Sales Orders

When a sales order (or other demand) is created for the kit item with the 'Include Kitting Components on SO' inventory setting checked, the kit item will display in bold and all components will also appear on the sales order (indented). By default the sales order price is based on the kit item and not the components. Pricing can come from AKA or the Selling Price tab just as with other inventory items. If the 'Price Based on Components/Modify Components' option is checked the unit price of the phantom item will be suppressed and the unit prices of the components will populate instead.

The system will create work orders for any components that are manufactured and material requirements for purchased components (if required). The required components will be listed In the Projected Material Exception list, however since there is no work order generated the system treats the demand as a DRP demand. Therefore the sales order information can be viewed via the 'DRP Demand' right click option in the middle grid.

When a Sales Order phantom Kit item is marked 'On Hold' or 'Ship Hold' the system also updates the status of the components accordingly.   When marked 'On Hold' no work orders will be created for manufactured kit components, and no material exceptions are generated for purchased items.

Modifications are not allowed on phantom components except line item notes can be added to the components for informational purposes, such as packaging instructions. Also, Kit components cannot be removed from a sales order. If the user attempts to make a change to a kit component a message will appear stating, "Direct modification of phantom component is not allowed - operation aborted."

If the Kit item changes status to non-phantom, when the Phantom check box in inventory is un-checked, modifications such as removing a kit component will be allowed.
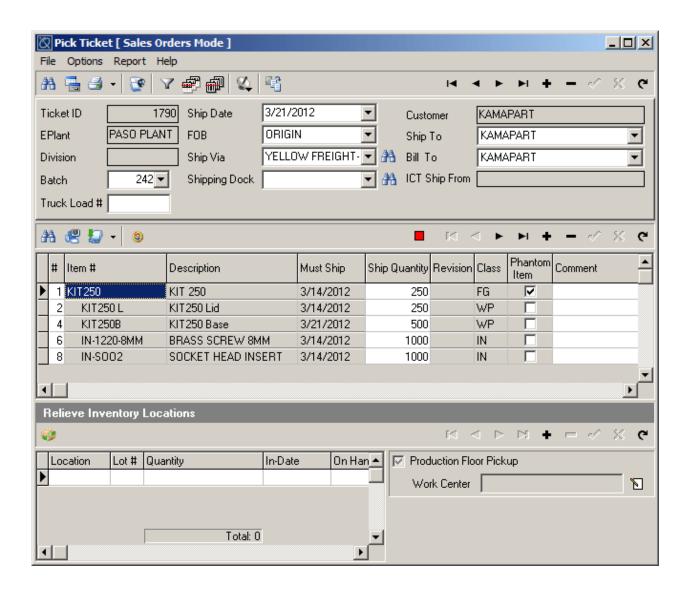
Shipping the Kit

Pick Tickets

When the Kit item is added to the pick ticket the Kit item is listed as a phantom item and the components from the kitting BOM will be listed in indented format on the pick ticket. Both the Kit item and/or the components can be picked.   Any quantity can be picked/shipped (whole or decimal) for Kit or component items and the sales order will update accordingly.

Note: If users plan to not have the components on hand but have the top level phantom kit with on hand (this rarely should be the case), and expect the components to follow to the pick ticket this should be done in SO Based Mode. Inventory Based mode will only pull the top level item with the on hand to the pick ticket.

Note: If a quantity to relieve has been selected for the phantom kit item a warning will appear when the user clicks on the Convert to Pack Slip button stating, 'Items marked Phantom have been assigned do you wish to continue?'. If the user selects Yes the pick ticket will be converted to a packing slip.   If No, the user is brought back to the pick ticket. This warning is due to the fact that a Phantom Kit should never be relieved from Inventory. It can have a quantity so that it can be invoiced, but for Phantom Kits to properly post to the GL through the entire process, only the components should be picked/relieved from Inventory locations. If a pick ticket is created selecting the Kit and the components in the detail section but only relieving the Components from a location (components are pulled and shipped, the Kit is selected but not relieved from a location) then when converting to a Packing Slip, posting PIT shipments and AR Invoicing the GL accounts are hit properly and everything stays in balance.

Pick Ticket [Sales Orders Mode]

File   Options   Report   Help

Ticket ID	1790	Ship Date	3/21/2012		Customer	KAMAPART
EPlant	PASO PLANT	FOB	ORIGIN		Ship To	KAMAPART
Division		Ship Via	YELLOW FREIGHT-		Bill To	KAMAPART
Batch	242	Shipping Dock			ICT Ship From	
Truck Load #						

#	Item #	Description	Must Ship	Ship Quantity	Revision	Class	Phantom Item	Comment
1	KIT250	KIT 250	3/14/2012	250		FG	☑	
2	KIT250 L	KIT250 Lid	3/14/2012	250		WP	☐	
4	KIT250B	KIT250 Base	3/21/2012	500		WP	☐	
6	IN-1220-8MM	BRASS SCREW 8MM	3/14/2012	1000		IN	☐	
8	IN-SOO2	SOCKET HEAD INSERT	3/14/2012	1000		IN	☐	

Relieve Inventory Locations

Location	Lot #	Quantity	In-Date	On Han

Total: 0

☑ Production Floor Pickup

Work Center

Partial Shipments of Kits

Users are able to process partial shipments of kits both via pick tickets and packing slips. If a pick ticket is generated for a partial shipment, users will need to modify the Ship Quantity field of the phantom item to reflect the proper quantity of kits to be shipped. Unless users are intending to relieve inventory for the phantom item (which is rarely the case), the "Relieve Inventory Locations" section of the pick ticket should not be populated for the phantom item. Similarly, if a packing slip is generated for a partial shipment, users will need to modify the Quantity field of the phantom item to reflect the proper quantity of kits to be shipped. Again, a location should not be selected and relieved.

Notes on using RF/WMS for shipping Kits:

If an IQRF user has pick ticket profile for 'Allow Undershipping' = N when picking a Kit item (instead of components), or partial component quantities, the user must edit the pick ticket to match what they are picking before converting it to a packing slip (for Status to = 'Pick Complete'). To avoid this requirement their user profile can be changed to allow undershipping in IQRF (this will affect all shipments).

Splitting Pick Tickets:

- Users can select a Kit and/or component items when splitting pick tickets. You can multi-select and change quantities to any whole number (not a decimal) on the proposed pick ticket. If decimal is entered the user will get an error, 'The Ship Qty of a phantom kit item must be a whole number, and should be greater than zero.' This message surfaces only for the phantom Kit item itself when splitting a pick ticket, not components.

Converted Packing Slip

When the pick ticket is converted to a packing slip the components are indented under the Kit item.   All of the components or Kits that were picked are relieved from inventory. The printed packing slip report will also display the components as indented items.
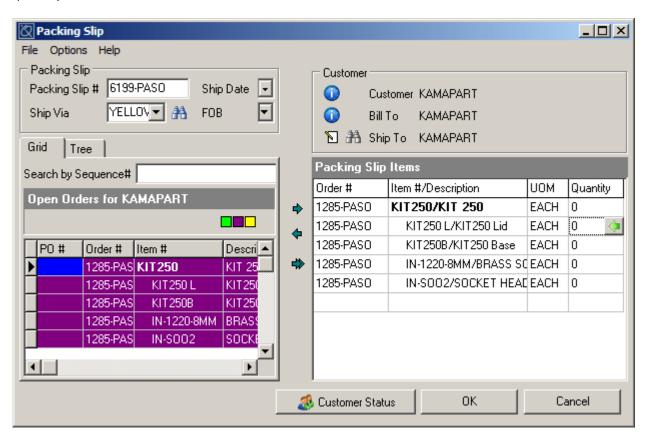
Packing Slips ▢ ◻ ✕

File Options Reports Help

General | Documents

Packing Slip # 5992-PASO

Customer	KAMAPART	Ship Via	YELLOW FF ▼ 🔍	Freight Charge	0.00
Ship To	KAMAPART	Ship Days	1	Terms	NET 30
Bill To	KAMAPART	Ship Date	8/9/2011 ▼	Tracking #	
EPlant	PASO PLANT	FOB	ORIGIN ▼	BOL Note	...
PS Date	8/9/2011	Pallet Count	0	Pool Bill #	...
	☐ Do not Invoice		☐ Awaits Inventory \	Batch	189

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Order #	Item #	Item Description	Quantity Shipped	Backlog	Packing Slip Invoiced Quantity	Order Invoiced Quant
1135-PASO	KIT250	KIT 250	500	500		
▶ 1135-PASO	KIT250 L	KIT250 Lid	500	0		
1135-PASO	KIT250B	KIT250 Base	500	0		
1135-PASO	IN-1220-8MM	BRASS SCREW	2000	0		
1135-PASO	IN-SOO2	SOCKET HEAD	2000	0		

Line Locations and Lot # | Comments | BOL

◄ ◁ ► ►►

Location	Lot#	Shipped	
▶ WH-1P		500	

Creating Packing Slips without Pick Ticket

A Kit can be shipped creating a packing slip without first creating a pick ticket, but the preferred method for shipping Kits is from a pick ticket.

When creating a packing slip for the kit item and the components, select the double arrow button to add all of the required items to the packing slip items section. The user must manually enter a quantity for the phantom kit item as there is no assign quantity button available. A value must be entered in order to update the sales order for the phantom item, and in order for the AR invoice to have pricing (as the only item that brings over pricing to the AR Invoice is the kit). If the quantity is left at zero a confirm message will appear stating, "Order# 'XXXX' (Row: #), Qty is Zero. Do you wish to create a packing slip with Zero entry?". The user should select No and enter a quantity for the Kit item. A location and quantity must also be entered for each component being shipped within the Kit by selecting the green assign quantity button in the quantity field.

If just the kit item (no components) are to be shipped just select the kit item and use the single arrow append button to add it to the packing slip items section. Select the location from the pop up and enter a quantity.

Note: If packing slips are created for only the components (Kit item excluded), using the Auto Invoicing function will result in burned invoice numbers.

Note: Phantom KITs will not have a Translog entry when a packing slip is voided. Inventory will not be placed back in On Hand for inventory items that are marked 'Phantom' and 'Include Kitting components on SO'. Instead, there will be an entry in System->Event Log->PS that reads: "Voiding Packslip #xxxx - Quick void - skipping ARINVT ID xxxxx because it is marked Phantom and Include Kitting Components on SO". Components will still be returned to inventory with the correct serial association.

AR Invoice

When creating the invoice, only the Kit is selected from the Uninvoiced Shipments tab.

Only the Kit item displays on the invoice

Note: If packing slips are created for only the components (Kit item excluded), using the Auto Invoicing function will result in burned invoice numbers.

Note: If the 'Price Based on Components/Modify Components' option is checked, when a packing slip is invoiced in the AR module, the components listed on the packing slip will appear on the Invoice. The price of the phantom will remain suppressed and the prices of the components will remain populated.

RMAs for Kits

The RMA module can be used to return shipments of a phantom Kit item and/or shipped components of a Kit. The shipments pick list displays the Kit item bolded with indented components. With the selection of a phantom Kit item for the return, the inventory of components shipped (where applicable) is not affected.

Note: If a Kit was selected for the RMA return and components of this Kit are also being sent back to inventory, jump to Transactions and Locations and remove the Kit item from inventory with backflush included. Optionally assign a Trans Code and/or type a Reason indicating the RMA #, which will populate in translog records for both the Kit and the components. If just a component of a Kit is being returned on the RMA and a credit memo is created, pricing for the component will be null (since there is no price for components of a Kit on the Sales Order), but can be manually entered.

Kitting and VMI

VMI functionality works with phantom kit items and components of a kit.   When performing a Consume VMI on a kit item, the system displays the finished phantom item (as grayed out per color chip) and the components shipped.   A quantity to consume can be entered for the kit and/or the components, and the system will pull the items shipped from their respective VMI locations.   When applying the quantity to consume for the kit, there will not be a VMI location displayed unless the phantom item was actually pulled from inventory during shipping.   When voiding the consumption for a kit item and/or components, the system will put the items shipped back to the VMI locations.   Return VMI will move the shipped kit and/or components back to non-VMI locations.

Standard Cost Related Notes

Since the Kit item is a phantom, there should not be labor or overhead costs associated to it (since this part is never produced). Also, the 'Post shipments awaiting invoicing/PIT' option must be checked in System Parameters -> Inventory Setup tab.   This is due to the unique circumstances related to Kitting, where the phantom items components are shipped but the phantom item is invoiced. In Post Inventory Transactions for the Shipment type, the system will pickup the components standard costs and GL accounts and the offset is accrued shipments. Then when the AR invoice is created, the system will pull back out of accrued shipments and post to 'shipped' accounts for raw material, etc.   This will be a wash if the kit does not have labor or overhead.

Masterbatch MFG Type

The Masterbatch manufacturing type is used to create items with a unit of measure based on a weight such as grams or pounds. The item produced is made up of several components which also must have a weight type unit of measure.

All of the fields are the same as described above (in General BOM Information for Generic BOM) except as noted below:

General BOM Info tab:

Batch Time	The time required to produce the batch, defaulting to seconds.

Item Details tab:

Std Batch Size	The standard batch size produced during the batch time.
Act Batch Size	The actual batch size produced during the batch time.

Assigning Batch Components

There are three methods to assign the batch components: Assign Batch Components by Percentage, Assign Batch Components by Quantity, or Assign Batch Components by calculating unit quantity based on weighted average.

Assign Batch Components by Percentage - Components are added by entering a percentage using this speed button. A form appears to associate all of the required components to produce the batch.

#	Item #	UOM	Qty Per Std Batch	Quantity Per	Batch Percent	SPG	Cost	Item
1	ACE-100-C0	LBS		0.47	47	0	2	ACET
2	ACE-500-NA	LBS		0.34	34	0	4.13	ACET
3	BL-NYLNAT/U	LBS		0.19	19	0	97805	UV S
		LBS	0	1	100	0	2.72	

From this form select the ADD (**+**) button and then click in the **Item #** field and select the ellipsis button. A pick list of inventory items with a primary material class will appear. Select the item from the list and enter the **Batch Percent** required of this material. Only items with a weight type unit of measure are allowed to be selected. The **Qty Per** field is based on the manufactured items unit of measure. It is calculated based on the Batch Percent. For example, the manufactured item has a UOM of LBS, the component item's UOM is KG with a Batch Percent of 33%, the Qty Per will be 14.96847, (33 * 0.45359). Continue this process until all of the required components have been added. The Batch Percent must total 100%.

Assign Batch Components by Quantity - Select this button to enter the batch components by quantity and then calculate the percentages.

from this form select the ADD (**+**) button and then click in the Item # field and select the ellipsis button. Select the item from the pick list and enter the **Qty Per Std Batch**. Continue this process until all of the required components have been added. Select the **Calculate** button to have the system calculate the Batch Percent. The Batch Percent must total 100%.

Assign Batch Components by calculating unit quantity based on weighted average - Select this option to have the system calculate the unit quantity based on weighted average. The following form will appear:

#	Item #	UOM	Parts	Unit Qty	Percent	SPG	Cost	Item Descriptio
1	BL-NAT/F	LBS	45	0.75	75	1.05	1.695222	BLEND OF NAT/
2	000050	LBS	5	0.083333	8.3333	1.11	0.667101	DFAR BONE GR
3	000100	LBS	10	0.166667	16.6667	0.9	1.05	T-4500 BLACK
		LBS	60	1	100	1.0261	1.502	

Calculate   Save & Exit   Cancel

From this form users can add materials to be used for the batch. Select the insert record button to add a row then select the ellipsis button in the Item # field to access the inventory pick list. Enter the quantity in the Parts field.

Select the Calculate button to have the system perform the weighted average calculation. Following are the calculations with examples based on the first line in the above screen shot.

- Unit Qty = (Qty/SUM Qty)   45/60 = .75
- Percent = (Unit Qty*100)   0.75 * 100 = 75
- SPG Total = For each item Parts/SPG = D, then SPG Total field = SUM(Parts/D):   D = (5/1.11) + (10/0.9) + (45/1.05) = 58.4728; SPG Total = 60/58.4728 = 1.0261
- Cost Total = (SUM(Unit Qty*Cost))   (0.75 * 1.695222) + (0.083333 * 0.67) + (0.166667 * 1.05) = 1.5022

If changes are made recalculate by clicking the Calculate button.

Any changes made to the worksheet are reverted if Cancel is clicked.

Clicking Save & Exit on worksheet, saves the changes and updates the BOM.

Right click on an item and select 'Jump to Inventory' to open the inventory module for the item.

Outsourcing

Occasionally the need arises to utilize operations of an outside vendor. EnterpriseIQ efficiently handles outsourcing two ways: via the purchasing and receiving of inventory items or via purchasing and receiving a miscellaneous item and production report. For either way you decide to handle outsource operations, you must first setup certain functions.

Follow each of the steps below accordingly.

Outsource - Step 1: Creating an   Outsource Vendor

The first step is to create your outsource vendor in Vendor Maintenance. Go to AP/Vendor Maintenance and select New from the pick list. Enter your vendor information as you would with any other vendor who is not an outsource vendor. The screen shot below shows our new outsource painting, Great Paint, Inc.:

Outsource - Step 2: Creating an   Outsource Work Center

Once you have the outsource vendor created, an outsource work center must be created. While the work center does not exist at your facility, adding a center to your listing will allow for BOM usage, as well as work orders and scheduling. You should create an outsource work center for each outsource vendor and/or each out source vendor process. For example, Great Paint and T& W Paint can be two separate work centers, but also Great Paint could do two outsource processes such as painting and hot stamping. In the latter example, you would want two distinct work centers set up for Great Paint.

The first step in adding an outsource work center is to verify that your system setup supports the OUTSOURCE Manufacturing Type. The easiest place to check this is from the work center module itself. From the Manufacturing Tab, select the Work Center tab, and choose any existing work center to view. From this open work center screen, choose Options/Mfg Types. Within this dialog box, verify that the OUTSOURCE type is listed. If it exists, you can proceed to add an outsource work center. If it does not exist, you need to add it using the following steps:

- Click ADD (+) button to add a new record.
- Click in the MFG TYPE field and from the drop down arrow, select OUTSOURCE or type in the word OUTSOURCE (spelled precisely and in upper case letters).
- Enter OUTSOURCED in the Description column (this will be used for all your outsource work centers, so do not call it by your vendor's name).
- Enter an optional Default Labor Rate. This rate will be used when linking a Type with a BOM, and can be used if you require labor allocation and you are using the production reporting option.

NOTE: If your facility is set up to use Manufacturing Work Cells, you must also add a new Cell and link it to this Manufacturing Type.   This can also be done from the Work Center screen, Options/Mfg Cells.

With the OUTSOURCE type created, you can now add a new work center. From the open Work Center screen choose the Add (+) button to insert a new Work Center or click "New" from the Work Center pick list.

- Choose a Manufacturing Type of OUTSOURCE and Manufacturing Cell (if using cells).
- Enter a Work Center number and a description (typically this is the process that your outsource vendor will be performing).
- Because the Manufacturing Type chosen is OUTSOURCE, you will see that the "Center Type" field has changed to read "Vendor". This allows you to link in the actual outsource vendor with the work center using the eyeglass search to the right of the field.
- The RealTime Information box is only applicable to an outsource work center if you have a license for this work center and even then the work center should only be noted as "RT Server is not Signaled".
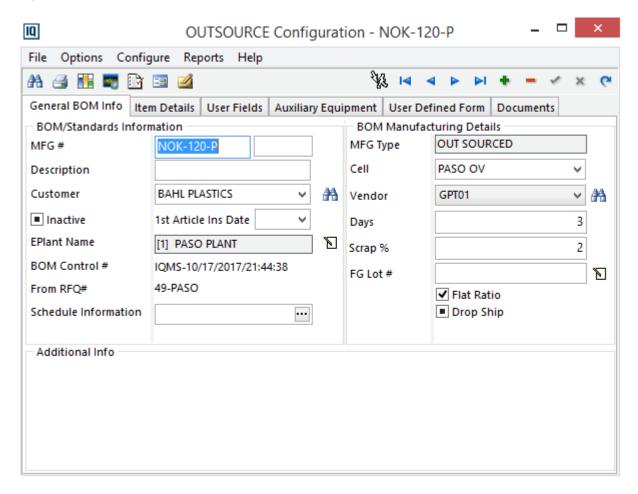
Your completed Outsource Work Center screen should look similar to this:

Outsource - Step 3: Creating a Bill of Manufacture for Outsourcing

With the Work Center created, we can now create an operation through the BOM system that requires the use of this center.

Begin by creating a new BOM and selecting the OUTSOURCE type. The outsource BOM behaves very much like the GENERIC BOM type, as there is no main material. The screen however, does reflect some important differences as seen and described below:

Like any other BOM, you will enter a MFG#, select a default customer (this is optional), and notice that instead of Center Type, the field says Vendor. From the drop down menu in that field, choose the vendor that you linked into your Outsource Work Center.

As with other BOMs you have created in the system, once the work center, or in this case the outsource vendor, has been selected, any work order that uses this BOM will be available for scheduling on all work centers linked to the same vendor.

The rate of production for an outsource operation is handled in two different ways. You can either set the production rate as a flat daily capacity (Days) or as a capacity per 1000 pieces (Days/K). In the example above, it takes three days to make every 1000 parts. To use the flat Days feature, you must check the "Flat Ratio" box. Posting your edit (using the "+" on the navigator bar) after checking that box will change the wording from "Days/K" to "Days". Whichever way you select to record production rate, this field is always used to generate the approximate time the operation will consume.

Use the field listing to familiarize yourself with the data fields prior to making any entries.

BOM/Standards Info

Mfg #	Up to 50 characters can be entered in this field. The number entered here is the number of the actual standard.
	Each configuration number and routing number combination must be unique. If the user enters a Mfg #/Routing # combination that already exists, a prompt will be issued informing that a duplicate number was entered. The user will need to reenter a new Mfg or routing number.
	Note: To view the STANDARD ID for the BOM select the Alt F1 keys and a pop up will display the ID (for example, Table = IQMS.STANDARD, ID = 46825).
Routing Seq #	This field can be used for informational purposes to define the routing step sequence of the BOM when there are several steps. This field displays in the BOM pick list.
Customer	This field shows the customer the bill belongs to.
From RFQ#	**Request for Quote Number**. The information displayed here originates from the Quote Module and will only be present if the standard was converted from a Quote.
	This field cannot be edited.
BOM Control #	The BOM Control number will change automatically when someone makes a change to the configuration. This field cannot be edited. This field will not update immediately. In order to see the change, the user would have to exit the BOM module and come back in.
	The field consists of today's date, time, and EnterpriseIQ user ID of the person who made the change.
EPlant Name	This field is used to designate the configuration to a specific EPlant. It is not a required field if EPlant is not being used.
Inactive	A BOM can be marked inactive. This will 'hide' the BOM from pick lists. To view an inactive BOM the pick lists have a new button in the upper right corner to 'view inactive' items.

Schedule Info	The user can enter up to 250 characters of information that will display when a work order is scheduled to a work center that uses this BOM. The information can be printed using the Print button from the BOM or from the schedule.
1st Article Ins Date	Enter in the **1st Article Ins Date** using the drop down calendar (Optional). This is the date that the configuration was first approved for use in a production run. This field is for information purposes only. This field description can also be changed by right clicking on the field and selecting the Define Label Text option. Enter in a user defined caption in the New Value field. The customized caption is based on Manufacturing Type. If the caption is changed for an Outsource BOM, all of the Outsource BOM's will have that same caption but not other types of BOM's such as Generic.

BOM Manufacturing Details

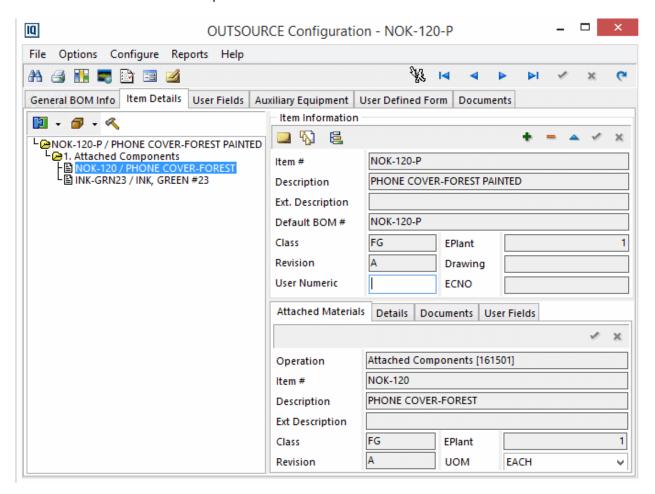| Mfg Type	Shows the 'Type' of manufacturing of this standard.
Cell	Optional. Cells allow the system to distinguish between types of machines and processes. For example, you may have extruders and injection
Vendor	Use the arrow drop down list to select the appropriate vendor for this particular BOM. The vendor list is compiled from the 'Type' field found within the Work Center.
Days/K	The rate of production for an outsource operation is handled with the Days per 1000 parts field entry unless the Flat Ratio is checked. This field is used to generate the approximate time the operation will consume.
Scrap%	This is the estimated amount of scrap that the process itself will generate. This is used in calculating the extra production time required to complete the run. For Outsource Central users, it is also used to determine the quantity of items for the Ship Orders.
Flat Ratio	Check this box if the rate of production is based on the number of days and not days per 1000 parts. Once checked, enter the number of production days in the preceding Days field to complete this operation. Note: When Flat Rate Ratio is checked, update schedule will look only at the number of days to determine the WO Start and End date. When flat ratio is un-checked, scheduling will look at the shop calendar set up and use the shift and hours/days information to determine the WO Start and End dates. Note regarding MRP: When flat ratio is selected, the system puts all the product in the first day of production. The daily material projections will show the entire amount being 'produced' on the first day of the work order. In purchasing, the program sees that the production date is the first day and schedules the consumed components to come in just in time to be used on that day.
FG Lot #	**Optional**. Link a Finished Goods Lot number to the BOM.

Drop Ship	This option is used in conjunction with the Outsource Central module. If checked it indicates the outsource vendor will drop ship the items to another vendor or the customer. Documentation is handled using ASN's through EDI.

Create the Part Number

Once you have set up the Manufacturing Number and the vendor, you will need to enter part number information. Within the BOM, go to the **Item Details** tab, and click ADD (+) button from the middle navigator bar. You will now add the part number and description as it will be returned by your vendor. When the part comes back from the outsource stage is it a different class or different number scheme? How you receive it back into your facility is the part number you want to add here.

Note: If the 'System-Generated Inventory#' option is enabled in System Parameters->Sequential Numbering tab, the system will populate the item number with the next sequential number. If the user clicks on the 'Pick Item' button and clicks 'New' on the pick list, the item # will be the same as what was generated. For example, if the next sequential item was '123', when selecting 'New' on the pick list it will still be '123'.   The value can be overwritten if desired.

You will also want to add any packaging or components to this BOM. This includes parts you previously manufactured and must now send to your vendor for them to complete. In our example below, we will be sending to the outsource vendor our manufactured part number NOK120. The vendor will use a one-to-one ratio and return to us the part number NOK120P.

Notice in the above example that we are also supplying our outsource vendor with ink with which he will paint our parts. This is optional, but if there are any items you send to your outsource vendor, it is imperative to add them to your BOM. This allows for proper tracking and purchasing.

Note For Outsource Central users only - There is an additional option available for items attached to an Outsource BOM. On the Details tab the user can select the **Exclude from Ship Orders** option to prevent an attached component from being added to the Ship Order. When checked, the item will still be in the material exception list. If it is not checked any attached items will also be added to the ship order to be shipped to the vendor. If the 'Drop ship' check box is checked on the BOM any attached components should have the 'Exclude from Ship Orders' checked in the attached materials detail section, otherwise the system assumes all items are to be drop shipped (the MFG item and the attached component) which causes the packing slip to be made for the wrong item. (Please see the Outsource Central help file for more information).

Quantity Breaks

You can assign quantity price breaks to an Outsource operation. Please note that this price list is for the cost of the vendor operation, based on quantity. It is NOT the selling price of the new item but rather what your vendor charges you for this operation.

To add vendor price breaks, click the Qty Breaks icon in the middle section of the Item Detail screen. Enter as many or few price breaks as appropriate. Optionally you can enter the date the price was entered/changed, the date the price becomes effective, and the expiration date of the price.

NOTES:

The system does not calculate the additional outsource cost for the vendor operation. The user must manually add the outsource cost element to the final item's standard cost tab if you want to use this cost to determine the Standard Cost. To add this manually, go to the Inventory-> Standard Cost tab of the item that gets returned from the vendor. Choose ADD (+) button from the navigator bar on the left, choose your cost element, and enter a price of that element. The manually added cost will be rolled up in higher BOMs.

If an outsource item is attached as a component to an Assembly Process, and the item changes, users should always clone the BOM and not just change it to a new item. This will prevent out of balance costing issues.

Outsource - Step 4:   Scheduling the Outsource Operation

EnterpriseIQ will automatically generate a work order for an OUTSOURCE operation just like it will for an INJECTION, EXTRUSION, etc. type operation. Of course, this assumes there is an order for the item in the Sales Order system, and no current inventory exists on hand.

To schedule work orders based on outsourcing, open the Scheduling module and select the OUTSOURCE type from the view pick list. Note that only those work centers linked to the OUTSOURCE Mfg Type are displayed.

Schedule these outsource work orders as you would any other work orders created by the system. While scheduling your outsource work orders are optional, it is helpful in determining which items your outsource vendor is working on. Not scheduling them will still allow you to use the outsource process however.

Note the Must Start Date on the work order. This date is calculated to be the date that you should send any consumed parts to your vendor. If your Outsource vendor has a transit time longer then the same day, you might want to use the Move Time field located in **Inventory > Mfg Tab > Move Time**. The transit time should be added to the manufactured item that you ship to your vendor (in our example, part number NOK120). This Move Time field is a days value, so if the transit time to your vendor is two days, enter 2 in that field. EnterpriseIQ will use this field to back up the Must Start Date so you have a more accurate reflection of when the Vendor should be sent parts.

Outsource - Steps 5 and Beyond in Outsource BOMs

Two Options for Receipt/Reporting of Items Completed by Your Outsource Vendor

As mentioned earlier in this section, EnterpriseIQ allows for two ways to handle Outsource Items: either by receiving from a purchase order or via production reporting. The first four steps are the same regardless of which way you choose to handle outsource items. It is from this point forward where you choose which method works best for your facility.

Option A will explain how to use the Purchase Order and **Purchase Order Receiving** modules to enter items returned from your outsource vendor, as well as backflushing any components you sent to him.

With Option A the steps are:

Create PO for Inventory Item
for Outsource Vendor

↓

Create Manual Packing Slip
for the Outsource Vendor and ship parts

↓

Create Inventory Location associated
to the Outsource Vendor

↓

Move the inventory on the manual packing slip
to the Outsource Vendor location

↓

Receive finished items and backflush WIP part
from Outsource Vendor inventory location

↓

Run Update Schedule and
Remove WO from schedule

Option B will explain how to use the Purchase Order and **Production Reporting** modules to enter items returned by your outsource vendor, as well as backflushing any components you sent to him.

With Option B the steps are:

Create PO for a Misc. Item so it does not affect inventory

↓

Create Manual Packing Slip for the Outsource Vendor and ship parts

↓

Create Inventory Location associated to the Outsource Vendor

↓

Move the inventory on the manual packing slip to the Outsource Vendor location

↓

Receive the Misc. Item PO

↓

Create a Production Report for the Outsource Work Center, disposition in FG and backflush out WIP

↓

Remove Work Order from Schedule

Outsource - Option A - Create Inventory PO for Outsource

Step 5: Create an Inventory Purchase Order

Enter a Purchase Order for your Master Inventory item as you receive it back from your vendor. Using the part number from our earlier BOM example, we would enter a PO for part number NOK120P. You want to enter pricing (that your vendor charges you so as to match the AP invoice that your vendor sends you later), total quantity the vendor will return to you, and the date(s) you requested parts be returned to your facility. For added reference you can enter a work order number in the comment field, but this is optional and will not affect the process.

NOTE: When Creating a PO to the vendor for the outsourced item, the work order will not disappear like it would on all the other items. The system recognizes that it is an Outsource item and it does not eliminate the work order.

Outsource - Option A, Step 6: Manually Ship and Adjust Your Inventory Locations

Creating A Manual Packing Slip

Because you have to send parts to your outsource vendor and do not have a sales order from him to ship them on a system generated packing slip, it is recommended that you ship any components to your outsource vendor on a manual packing slip. This gives you a record that the parts were shipped but does not affect your inventory's on hand quantity. Since you still own the manufactured parts and components you are sending, you do not want to deduct them from inventory at this point.

Remember, your manual packing slip should be created for the components that you are sending to your outsource vendor, not the part he is returning to you. Thus, the manual packing slip on the next page reflects the manufactured item and ink we need to send to Great Paint.

Notice, the amounts sent to Great Paint also reflect the scrap that is anticipated based on the setup of the BOM. This is optional. The correct amounts consumed will be deducted at a later time. However, the exact amounts you send to your vendor should be noted here.

Manual Packing Slips

File   Options   Reports   Help

General   Documents

Packing Slip #	10-PASO	Company	GREAT PAINT, INC.	Postal Code	95467
User ID	IQMS	Address 1	43569 LOMA VERDE WAY	Contact	
EPlant	[1] PASO PLANT	Address 2		Tracking Pro #	
Date	10/31/2017	Address 3			☐ Use USA mask
Ship Via		City	SALINAS	Telephone #	408-234-3990
FOB		Country	UNITED STATES OF AMERIC	Fax #	
		State or Region	CA	Status	Active
				Vendor RMA #	

Comment

Quantity	Item #	Description	Total Packages	Total Weight	Total Ski
5100	NOK-120	PHONE COVER-FOREST	10	1000	
25.5	INK-GRN23	INK, GREEN #23	1	25.5	

Manually Adjusting Inventory Locations

Once you have prepared the shipment to your outsource vendor, it is also recommended that you adjust your inventory locations to reflect that those items sent, while still considered on hand, are no longer at your facility. Users should set up a location called Outsource Vendor. You can have one location per each outsource vendor, or one location for all outsource vendors.

In our example below, we have one location called outsource and all items sent to outsource vendors are designated with that location:

Don't forget to move all items sent to your vendor, not just the manufactured part.

Outsource - Option A, Step 7: Receiving Items in From Your Outsource Vendor

After your vendor has completed the parts and sends them back to you, you need to receive them into your inventory. Because you have already created a Purchase Order from Inventory, you want to receive those items from your vendor off that purchase order. Since you will not (with this option) be completing a production report, it is upon receiving that you will also want to backflush.

- Open the purchase order from which you sent the items to your vendor, in the PO Receiving module.
- Enter the quantity of the finished part your vendor is returning to you

When posting this item into inventory, make sure the "Include Materials Backflush" box is checked on the "Add To Location(s)" screen, as in the example below:

With the Include Materials Backflush box checked, the receiver can choose the "Calculate" button and EnterpriseIQ will determine the accurate amount of material needed to backflush based on the Add To quantity. All calculations are based on the BOM. If your Outsource Vendor notes either on the receipt, by other means, that he did indeed create scrap, the quantities consumed can be adjusted here.

The locations from which to backflush should be the outsource locations you already moved the consumable items to in the previous step. This creates less work on maintaining those locations later

---

Hint: As a reminder to your receiving department that they must always backflush materials on this returned item from your outsource vendor, you can set this item in the master inventory to always bring up the Include Materials Backflush box. To do this, go to the outsource item in Inventory. Click on the Manufacturing Tab and check "**Backflush Materials**" box.

Note: If the quantity of the components are adjusted then in Post Inventory Transactions-> Receiving the variance will go to the System Default MFG Variance GL Account. This is a receiving transaction and the system does not look at how much should have been received compared to actual on the consumed items and come up with a variance on the attached components like in dispositioning. It takes the difference in the costs and that is what it considers to be the 'outsource' cost. To get individual variances users can either use the production report (Option B – Create Misc PO for Outsource) for outsource items instead of PO receipts or adjust the components manually after receipt.

Receiving Outsource Serialized Inventory Control Items

If Outsource Central is used, for Serialized Inventory Control (SIC) items users can select specific serial numbers to relieve. The system will display a pick list of the serial numbers in the In-Transit location (the serials sent to the vendor). (Note: Only individual, not full pallet, labels may be selected). If the double arrows button is selected, for non-SIC items the system will populate the location(s) based on the IN TRANSIT locations based on the parent work order # that is associated to the outsource PO that is associated to the PO receipt. If the consumed item is SIC, a pick list of labels will appear to allow the user to select the labels (when using Outsource Central).

If Outsource Central is not used when selecting the double arrow option the system will backflush based on FIFO. When using the single arrow option the screen will display all of the labels for the item, not just the ones sent to the vendor. (This is because the system does not have the required links to the sent serial numbers as it would when using Outsource Central). The Location is listed in the grid to enable users to choose the ones that were sent to the vendor.

Your Finished Item is now in inventory and available to ship to a customer against a sales order or is available to move to another operation that consumes this item.

Outsource - Option A, Step 8: Removing the Work Order From Your Schedule

The last step is to remove the Work Order from your schedule. Once update schedule is run, the requirements, if met, will have adjusted this work order to show the color code of all white (meaning that there are no longer requirements for this to be run). Items are now in inventory and you can adjust your schedule to more accurately reflect those items for which your outsource vendor is now responsible.

Outsource - Option B - Create Misc. PO for Outsource

Step 5: Create a Miscellaneous Purchase Order

Enter a Purchase Order for a Miscellaneous Item. We enter a miscellaneous item so that, when received back in from the vendor, we are not affecting inventory. Using the part number as our description, we would enter a PO for miscellaneous item NOK120P.   You will want to enter pricing (that your vendor charges you so as to match the AP invoice that your vendor sends you later), total quantity the vendor will return to you, and the date(s) you requested parts be returned to your facility. For added reference you can enter a work order number in the comment field, but this is optional and will not affect the process.

Outsource - Option B, Step 6: Manually Ship and Adjust Your Inventory Locations

Creating A Manual Packing Slip

Because you have to send parts to your outsource vendor and do not have a sales order to ship them on a system generated packing slip, it is recommended that you ship any components to your outsource vendor on a manual packing slip. This gives you a record that the parts were shipped but does not affect your inventory's on hand quantity. Since you still own the manufactured parts and components you are sending, you do not want to deduct them from inventory at this point.

Remember, your manual packing slip should be created for the components that you are sending to your outsource vendor, not the part he is returning to you. Thus, the manual packing slip on the next page reflects the manufactured item and ink we need to send to Great Paint.

Notice, the amounts sent to Great Paint also reflect the scrap that is anticipated based on the setup of the BOM. This is optional. The correct amounts consumed will be deducted at a later time. However, the exact amounts you send to your vendor should be noted here.

Manually Adjusting Inventory Locations

Once you have prepared the shipment to your outsource vendor, it is also recommended that you adjust your inventory locations to reflect that those items sent, while still considered on hand, are no longer at your facility. Users should set up a location called Outsource Vendor. You can have one location per each outsource vendor, or one location for all outsource vendors.

In our example below, we have one location called OUTSOURCE and all items sent to outsource vendors are designated with that location:

Don't forget to move all items sent to your vendor, not just the manufactured part.

Outsource - Option B, Step 7: Receiving Items in From Your Outsource Vendor

After your vendor has completed the parts and sends them back to you, you need to receive them into your facility. Because you have already created a Purchase Order for a miscellaneous item, even when you receive them inventory will not be affected.

- Open the purchase order from which you sent the items to your vendor, in the PO Receiving module.
- Enter the quantity of the finished part your vendor is returning to you

When posting this item into inventory, you will get a message that there is no location assigned because this is a miscellaneous item. That is correct. You just want a record that the vendor returned the parts from your original purchase order.

Outsource - Option B, Step 8: Creating a Production Report for you Outsource Work Center

Your items are now at your facility and since they were received in from a miscellaneous purchase order, you still need to backflush and report the finished item into inventory. You will do this via a production report.

To create a new production report, you will complete the following steps:

- Go to the **MFG Tab > Production / Labor Reporting** and click the button for Non-RT.
- Enter the date of production (or the receiving date), shift, and cell (is using cells).

- From the blank production report screen, select ADD (+) button from the top navigator bar.
- Choose to enter either by the Work Order browser (if you know the work order number created by the system to make these parts) or by the Mfg #.
- Enter the appropriate Work Center (or outsource vendor) for where these parts were completed.
- Choose OK (if this is the only item to add to your production report) or Apply (to add in a batch process).
- Enter in the total hours, cycles, downtime, etc.… or simply enter in the total quantity received from your vendor in the lower portion of the screen that shows item number being reported.
- Once all items have been noted on the production report, you can auto-disposition or disposition the selected item. *Don't forget to enter scrap and recalculate the materials if manually dispositioning selected items.*

Your completed production report should look similar to the following:

Once dispositioned, your Finished Item is now in inventory and available to ship to a customer against a sales order or is available to move to another operation that consumes this item.

Don't forget to either relieve components from the OUTSOURCE location or to do a manual location-to-location adjustment to accurately reflect locations of your inventory items.

Outsource - Option B, Step 9: Removing the Work Order From Your Schedule

The last step is to remove the Work Order from your schedule. Once update schedule is run, the requirements, if met, will have adjusted this work order to show the color code of all white (meaning that there are no longer requirements for this to be run). Items are now in inventory and you can adjust your schedule to more accurately reflect those items for which your outsource vendor is now responsible.

Slitting

Slitting is a manufacturing process by which a single roll of material (plastic, paper, sheet metal, rubber, etc.) is placed on a rotating spindle and knives are used to cut lengthwise strips of the material as it unwinds from the roll. Characteristics of the roll often include an inner diameter (Core Size), outside diameter (OD), width, and length. In addition, the material itself may have properties such as gauge (thickness), special coatings, and density (often stated as Specific Gravity or SPG). A mathematical formula exists between ID, OD, gauge, and length in order to calculate the fourth variable if only 3 are known. Also, density and width can be incorporated into that formula to calculate the weight of a roll. The slitting process often produces trim which is basically an unused strip of material on either end of the roll. Trim is typically handled as regrind.

For example, the primary material may be an 8 feet in diameter and 8 feet wide, and the finished products may require this material in 6", 8" and 12" widths. Rather than require a separate BOM for each potential width, all possible items are added to a single Slitting BOM. The 'Agg. Demand Collector' (ADC) box is checked to indicate the system will analyze the demand and create substitute BOMs associated to firm work orders based on the requirements.

Slitting can be designated as inline slitting or offline slitting.   Offline slitting occurs when a master roll removed from inventory, loaded onto a slitting machine, and then cut into strips.   Inline slitting occurs when the material is directly cut into slits as a final step in the extrusion process.

Slitting Notes:

- Slitting will work with or without serialized inventory control.   Material can be represented as different inventory items (if not using SIC) or as a single item with dimensional characteristics (if using SIC).   The SIC item would be a material with the exact same characteristics (except for slit width) and the SIC dimension would represent width.

- When using the ADC functionality update schedule creates an intermediate work order which must be further "massaged" to generate the slitting work orders. The intermediate work order represents aggregate demand for a particular item. The final slitting work orders are created via the Slitting Optimization module within Work Orders.

The slitting BOM is based on the concept of an extrusion BOM.   The primary material is the master roll which is the item that typically will be used as the source for the slit material.   Manufacturers will often substitute a roll of smaller width if one is available and it leads to less scrap.   Within EIQ, any Alternate Items attached to the master roll are considered candidates for "substitution" within the slitting process.

Primary Material for Slitting BOMs

A new Inventory Class can be created for the Master Rolls if desired. If a new class is to be used for the master roll make sure the 'Primary Material' box is checked so the master roll can be designated on the BOM.

Create a Master Roll inventory item

Once the basic information is entered such as item #, revision, description, and UOM, enter the physical characteristics by selecting the Physical Characteristic button ![button icon]. This includes the Volume, SPG, Length, Width, Gauge, Core Size, and Outside Diameter.

Note: The   Master Roll must be in same unit of measure (UOM) as the Slitting MFG Type. If it is set up as Slitting by length then the Master Roll must be in a length UOM. If it is set up as Slitting by weight then the Master Roll must be in weight UOM.

The unit of measure defaults to inches but can be changed. From the Physical Characteristics File menu select **Physical Characteristics UOMs**.

System Default / EPlant	System Default	PASO PLANT	
ID	0	1	
Volume	IN	IN	
Length	IN		
Width	IN	IN	
Gauge	IN	IN	
Core Size	IN	IN	
OD	IN	IN	

A form will appear with a System Default column and columns for each EPlant. Select the drop down list to choose a different UOM.

Create Slit Items

The manufactured slit rolls are created in the same manner as shown above, or they can be added on the fly while creating the BOM on the Item Details tab.

Note: In Inventory the Physical Characteristics are automatically cloned when cloning an item. If they are different than the item cloned from be sure to make those changes for the new item.

Alternate items can be set up if desired.   For example, an item may represent a roll 120 inches wide. The slitter also stocks a roll of the same material and gauge that is 100 inches wide and can be substituted for the master roll if the total width of all slit rolls plus trim on the work order is to be 100 inches or less. The 100 inch roll would then be designated as an alternate item for the 120 inch roll. (Refer to the Alternate Items section for more information).

Slitting Manufacturing Type

The setup for the Slitting Mfg Type is similar to other types. Refer to the Manufacturing Types section for details. There is one unique field related to Slitting:

Default UOM - This field on the General tab is unique to the Slitting MFG Type or a user defined type based on Slitting. A UOM based on weight or length can be specified. This setting affects how the BOM, Work Orders, Production Report and RealTime™ displays UOMs. When a new BOM is created the system will look at the Mfg Type's Default UOM to determine if the BOM is weight or length based, and will use the UOM on the BOM when adding new BOMs.   The system will not allow the user to switch from weight to length if there are any BOMs for the Mfg Type. If attempted an error will appear stating, 'Unable to change this Mfg Type. BOMs within this Mfg Type with the prior UOM that cannot be converted.' Note: If both types (weight and length) are used then they must be two different MFG Types (based on SLITTING).

Slitting BOM

The sample below shows a completed configuration. This is the main entry screen for building a BOM for a Slitting standard. It contains all of the standard information such as the customer, manufacturing type, line size, Feet/Lb, Lbs/Hr, materials, etc.

SLITTING Configuration - SLITTIING MR01

File   Options   Configure   Reports   Help

General BOM Info | Item Details | Certified Employees | User Fields | Auxiliary Equipment | User Defined Form | Documents

BOM/Standards Information

Field	Value
MFG #	SLITTIING MR01
Description	SLITTIING MR01
Customer	SANDY INC.
☐ Inactive	1st Article Ins Date
EPlant Name	[1] PASO PLANT
BOM Control #	IQMS-12/18/2018/16:11:29
From RFQ #	
Schedule Information	

Material/Regrind

Field	Value
Material Spec.	MR-01
EPlant	1	MASTER ROLL #1
RT Signal Rate	0 (ft)
Allow Reg %	
Gauge/Thickness	0.035 (in)	Min Width	100 (in)
SPG/Density	0.983	Max Width	100 (in)
Core Size	5 (in)	Trim Width	0 (in)
Outside Diameter	25 (in)

BOM Manufacturing Details

Field	Value
MFG Type	SLITTING
Cell	PASO SLITTING
Line Size	SLITTER
Feet/Lb	10.
Lbs/Hr	2000
Setup Hours 1	1
Setup Hours 2	
Eff. Factor	98
Scrap %	
Labor	1
FG Lot #	
UOM	LBS
Max WO Batch Size	

☑ Assy @ Mach
☑ Agg. Demand Collector

Tool Information

Tool Equipment #	Location	Primary ☐	Description

Production Summary

Feet/Min	333.33
Hours/K-Lbs	0.50
Net Hours/K-Lbs	0.51

Select the item to be used as the Master Roll in the Material Spec. field. The Gauge, SPG, Core Size, and Outside Diameter will populate automatically from the item master. The primary material's UOM must be in same unit of measure (UOM) as the Slitting MFG Type (length or weight). If the selected primary material is not, a warning will display stating, "The primary material selected does not match slitting by weight or length" (whichever UOM that applies). When selecting the 'OK' button on the warning users should cancel the changes made so the BOM is not saved with a material in an incorrect UOM. If the BOM is saved with a primary material that is not the same UOM as the Slitting BOM, the Costed BOM will show an incorrect extended cost causing the standard cost of the manufactured item to be incorrect.

Min and Max width should be set to actual width of master roll. The Trim width should also be populated. This information carries over to the Slitting Optimizer.

If using RealTime™, a RT signal rate should be specified. This is the number of feet slit per cycle reported by RealTime™.   This will vary by machine based on where the signal is being captured. For   Slitting by Weight the RT Signal Rate will be in feet or meters depending on the Native UOM setting in System Parameters. For Slitting by Length BOMs the UOM for RT Signal Rate will match the BOM's UOM.

Lbs/Hr is the rate of production for the machine.

Check the 'Agg Demand Collector' button to utilize the Slitting Optimizer in the work order. If this is not checked intermediate work order are not created, just the final work order based on demand.

Refer to the General BOM Information for Generic BOMs section for details on the standard BOM fields.

Item Details

For Mfg Type's with the Default UOM set to weight, the manufactured item will include Slit Roll Weight and Width. The weight unit of measure is based on the UOM on the General BOM tab.   For Mfg Type's with the Default UOM set to length based, the manufactured item will include Slit Roll Length and Width. The length unit of measure is based on the UOM on the General BOM tab.

The UOM for the Slit Roll Width for both types will be based on the settings from Physical Characteristics UOMs.

Select the insert record button then select Pick Item if the rolls have already been added to inventory, or enter the item information to add an item on the fly. Note: If creating new items from the BOM be sure to enter the Physical Characteristics in Inventory.

Set the Slit Roll Weight and populate the Slit Roll Width. Continue to populate with all items that can be produced by the master roll.

Packaging and components can also be added to the BOM if required.

Note: If the Slitting MFG Type is set up for a length unit of measure (i.e. FT), the field is labeled Slit Roll Length instead of Slit Roll Weight.

Note: The Slit Roll Weight/Length should be equal to 1 of the UOM of the FG item.   Example: If the UOM for the BOM and the FG item is in Feet, then enter a Slit Roll Length of 1.   If it is in Rolls, then enter the full length or weight of a roll based on the UOM of the BOM.   So if a Roll weighs 1 KG, and the BOM is in Grams, then the slit Roll Weight would be 1000 Grams.

Note: Patterns Std and Patterns Act are for costing purposes only. They will carry through onto the ADC work order as cavitation, but they will not automatically pull into the Slitting Optimizer. They need to be manually added as multiple Slits.

Slitting Work Order

Once there is demand in the system a work order will be created. If the ADC box was checked on the BOM the work order will have the Slitting Optimizer button at the top.

Slitting Optimization

When the Slitting BOM has the 'Agg. Demand Collector' option checked this module will be available on the work order. Running update schedule creates an intermediate work order which must be optimized to generate the slitting work orders. This module allows users to define a pattern so the unused width is minimized.

Select the Slitting Optimization button on the work order ![icon] to access the form. The Slitting Optimization module can also be accessed directly from the Manufacturing tab of the EIQ Launcher Bar. When accessed from the Launcher Bar a pick list of Slitting ADC Work Orders filtered for the logged in EPlant will appear. The pick list also includes a "Has WOs" column that will show ADC work orders that have had Slitting Work Orders already created for them.   This will help to show what orders still require slitting work orders to be created without running update schedule or going into individual records.

Optimization Parameters

Slitting Parameters

Allowed Over Production % [ ]

Allowed Under Production % [ ]

☒ Round Sets Per Master Roll

[OK] [Cancel]

From the Edit menu select Optimization Parameters to set a percentage for over and/or under production. Enter a specified percentage as a whole number that the slitting optimizer will use to color code the total manufactured quantity column in the Satisfied Order section. The setting compares Release Quantity to Total Manufactured Quantity in the Satisfied Orders section and color codes the Total Manufactured Quantity if the difference % is larger than specified in the Parameters screen.

- Allowed Over Production %
- Allowed Under Production %

If the manufactured quantity is > release quantity * (1 + tolerance), or if manufactured quantity is < release quantity * (1 - tolerance) then the total manufactured quantity column will be red.

- Round Sets Per Master Roll -   If checked, and the calculated value for Sets Per Master Roll in the Satisfied Orders grid is a decimal (1.5) the value will be rounded down.

Work Order Section

The Work Order section in top left populates the Master Roll information based on the BOM. This includes the dimensions of the master roll such as OD, Core Size, and Length.

Right Click Options:

- Jump to Inventory
- Jump to ADC BOM
- Jump to ADC Work Order

Slitting Optimizer Sections

- **Patterns** – To create roll patterns.
- **Satisfied Orders** – To designate which releases to fulfill and any make-to-stock items to slit.
- **Stock Rolls** – To select specific rolls to use (from stock master rolls and any alternate items).
- **Material Summary** – The material summary information such as master rolls required and quantity to manufacture based on the patterns.

Patterns

From the Patterns section select the + button to add a record. This initially populates with the information from the BOM (roll width, trim width).

Patterns	
#	Slits	Inline	Roll Width [in]	Roll OD	Part Width [in]	Trim Width [in]	Unused Width [in]	Sets	Part Weight [lbs]	Matched Item #	Matchi
1	2	☐	100		100	0	0	1	186.44	MR-01	

#	The pattern record number.
Allocated Weight	This is the weight of the allocated stock rolls.

Inline	Check this box if the material will be directly cut into slits as a final step in the extrusion process. When this box is checked the Stock Rolls section will not display. The checkbox cannot be checked if a Stock Roll has already been selected. When work orders are generated and Extrusion work order is created from the BOM assigned to the Master Roll Item associated to the ADC work order.
Master Rolls Required	This is calculated as the number of Master Rolls required for the Pattern.
Matched Item #	The system will match a master roll if possible based on the roll width and it will populate in the Matched Item # field. If a number is added to the Roll OD field than the matched items displayed will be an exact match to both the Roll OD and the Roll Width. If a master roll cannot be matched this field will be red. Note: Roll Width and Roll Outside Diameter values come from the Physical Characteristics for the master roll in Inventory.
Part Weight	This is the sum of the Manufactured Quantity for the items listed in the Satisfied Orders section.
Part Width	The Part Width field will update as items are added to the Satisfied Orders section. If the Part Width + Trim Width is greater than the Roll width this field will be in yellow.
Roll OD	If a number is added to this field than the system will also evaluate the Roll OD in addition to Roll Width to find matched item #'s. If this field is left blank, the system will just match based on Roll Width.
Roll Width	The Roll Width is the Minimum Width from the BOM.
Sets	Sets represents the number of times the pattern will be repeated.
Slits	Number of cuts. This populates based on the total slits from the Satisfied Orders section.
Trim Width	The user can override the Trim Width in the Patterns section of the Slitting Optimization form that is initially populated from the BOM.
Unused Width	Unused Width is a calculated field (Roll Width - Part Width - Trim Width)

Right Click Options:

- Jump to Slitting Work Order - If a slitting work order has been generated the line item will turn green and users can jump tot he work order.

- Jump to Master Roll Work Order - This will allow users to jump to the work order to manufacture the master roll if applicable.

Satisfied Orders

This is where the user defines what the pattern will look like and manually select which demand will be fulfilled. The goal is to define a pattern such that off-cut (i.e. unused width) is minimized.

From the Satisfied Orders section select the + button to add a record. The Add Items form will appear:

- Select from the 'On Order' tab to satisfy demand requirements from sales orders. If the 'Hide Fully Satisfied Orders' button on the On Order tab is pressed when adding an item in the Satisfied Orders section, only orders that have demand that has not already been completely added to a pattern are visible. Toggling the button will show all items with demand regardless of whether they have already been added to a pattern.

- Select from the 'All Items' tab to create items to be stocked for future demand (Make-to-Stock).

Item Information	Item #, Description, Rev, UOM, and Class.

Item's Physical Characteristics	Length and Width
Manufactured Quantity	Manufactured weight * Slits
Order # **Customer #** **Ship To**	Sales order #, Customer #, and Ship To associated to the item if applicable.
PO #	PO # associated to the item if applicable.
Release Date	The date of the sales order release.
Release Quantity	Release quantity from the sales order.
Sets per Master Roll	This is calculated as matched roll length divided by part length. Example: If a matched roll has a length of 5000ft and items in a set have a length of 1250ft the sets per master roll is 4. If the 'Round Sets Per Master Roll' parameter is checked (Edit menu), rounding down will occur (i.e. a value of 3.6 sets per master roll is interpreted as 3 sets per master roll).
Slits	Enter the number of slits for the item. Users can experiment with the Slits column until a quantity manufactured will meet demand (Manufactured Quantity field will turn yellow)
Total Manufactured Quantity	The total quantity added to the Optimizer for the item from all patterns. This is what is compared to the order quantity. If the total manufactured quantity is less than the demand this field will be red, if it is more it will be yellow.
Weight	This is a calculated field based on the value from the Physical Characteristics form in the inventory module (Edit Physical Characteristics speed button). (Length * Width * Gauge) in cm * SPG * .001 KG/CM3 = weight in KG, then converted to the appropriate weight unit

Note: The system allows for a different Core Size and/or OD (and thus a different length) on the item produced than is called for on the BOM Master Roll Item.   This affects the Rolls Per Master Roll column in the Satisfied Orders grid and Cavitation on the resulting work order.

Right Click Options:

- Jump to Inventory
- Jump to Sales Order

Stock Rolls

The pick list will only list rolls with a width listed in the Roll Width in the Pattern section or greater. The rolls must have a serial (label) and exist in a location. Rolls that have already been allocated are not available in the pick list to add to a work order. Different Master Roll item numbers with appropriate widths can be selected in the Stock Rolls section of the Slitting Optimizer if the items are added to the Master Roll inventory record as an Alternate Item. Once a roll has been allocated, only additional rolls of the same width are available to be added. Once stock roll(s) are selected they will appear in this section. The fields include Item information such as Item #, Description and Rev. Also included are serial number, dimensions, and location.

Right Click Option:

- Jump to Inventory

Generated Work Orders

Once the information is complete in the Slitting Optimizer select the Generate Work Orders button. The system will create substitute work orders based on the patterns from the Optimizer. These work orders will be available to schedule where the planned ADC work orders will not be listed in the insert job screen, and are not scheduled as part of Auto Load.

Notes:

Only slitting items from a Slitting BOM marked as Agg. Demand Collector that have demand will show in the Work Order picklist. Only the item with demand will display in the Configuration Details section of the Work Order.

Material requirements are calculated for a Slitting work order from the generated substitute BOM, the requirements for ADC work orders are ignored.

The customers whose demand is being filled by the slitting work order will appear on the work order, and when multiple customers are attached, the system will display the first one by default.

Schedule allocation will not occur against ADC Slitting Work Orders.

When making a manual work order for a Slitting item it must be done via the Slitting Optimization module.   An ADC work Order can be created via the Work Order module, but Slitting Work Orders will then need to be created via the Slitting Optimizer.

For example, using the screen shot below the system would generate two work orders for the designated patterns.

Slitting Optimization

File Edit Help

Workorder

Work Order #	108108
⊟Master Roll Item #	MR-01
Gauge [in]	0.035
Outside Diameter [in]	28
Core Size [in]	6
Length [in]	25
Min Width [in]	120
Max Width [in]	120

Material Summary

⊟Master Rolls Required	
# of Rolls	2
Material Weight [lbs]	5007.19
Material Length [in]	50
Part Weight [lbs]	4589.92
Part Length [in]	200
⊟Allocated	
# of Rolls	3
Weight [lbs]	21000
Length [in]	75
⊟To Manufacture	
# of Rolls	-1
Weight [lbs]	-15992.81
Length [in]	-25

Patterns

#	Slits	Inline	Roll Width [in]	Part Width [in]	Trim Width [in]	Unused Width [in]	Sets	Part Weight [lbs]	Matched Item #	Allocated Weight [lbs]
1	4	☐	120	110	2	8	1	2294.96	MR-01	11000
2	4	☐	120	110	2	8	1	2294.96	MR-01	10000

Satisfied Orders

Item #	Width [in]	Order #	Slits	Manufactured Quantity	UOM	PO #	Release
SR_03	60	1492-PASO	1	1251.8	LBS	SLIT T1	01/13/20
SR_05	20		2	834.54	LBS		
SR_06	10	1493-PASO	1	208.63	LBS	SLT 2	01/13/20

Stock Rolls

Serial #	Item #
000004479	MR-02

Generate Work Orders

For Pattern #2 the work order would look like this:

SLITTING Work Order

File   Reports   Help

Work Order #	108147	Material	MASTER ROLL #1	Prod Hours	0.70
	☑ Firm	Center Type	SLIT	Must Start	01/13/2015 5:48:11 AM
				End Date	01/13/2015 7:00:00 AM
Manufacturing #	SUB-45452 ···	Origin	MANUAL	Bucket #	
Labor	0.5 ···	Setup Hours	0.50	⊞Scheduled On	
Customer	···	Lbs/Hr	2000	FGLot	
EPlant	[1] PASO PLANT	Cycles Planned	0	⊞Type	
Priority Level		Lbs Req	1252	Auto Remove	System Default
	☑ Priority			Priority Note	
	☑ Run Hold (Finite Schedule	Bom UOM	LBS	Priority Note 2	
				Make To Order #	
				Added By User	IQMS
Components Based On	BOM			Project #	
				Date Created	01/13/2015 4:26:19 PM

Configuration Details

Item #	Description	Cav/Multiplier
SR_03	SR3 60 Inches Wide	1
SR_05	SR5 20 Inches Wide	2
SR_06	SR6 10 Inches Wide	1

Delivery Quantities

Quantity	Delivery Date	Order #	PO #	PTAllocate ID	Warehoɪ
1251.8	01/13/2015 7:00:00	1492-PASO	SLIT T1		

It includes the three items each with the corresponding multiplier based on the slits. The Lbs Req, Cycles Planned and Lbs/Hr are based on the weight of the master roll.

When a work order is generated from the optimizer users can right click from the Configuration Details section and select Jump To Slitting Pattern to access the Slitting Optimization form.

Material Allocation

From the work order users can access the Material Allocation form. The system handles the UOM conversions for Parts Per if applicable.

Example for Slitting by Length:

- Master Roll = 100 inches wide, 3600 inches length
- Slit Roll 1 = 35in
- Slit Roll 2 = 45in
- Slit Roll 3 = 10in

[Total of Slit Rolls is 90 inches of the 100 inch wide Master Roll]

- The parts per for Slit Roll 1 is (35 / (35+45+10)) * 3600 = 1400 in
- The parts per for Slit Roll 2 is (45 / (35+45+10)) * 3600 = 1800 in
- The parts per for Slit Roll 3 is (10 / (35+45+10)) * 3600 =   400 in

WO # 130693 Allocated Materials

Item #	Quantity	Total Allocated	Parts Per	Kind	OnHand
SLIT-L 1 35	300	0	1	Top Item	
MR-04	420000	0	1400	Primary Material	40252
SLIT-L 2 45	300	0	1	Top Item	
MR-04	540000	0	1800	Primary Material	40252
SLIT-L 3 10	300	0	1	Top Item	
MR-04	120000	0	400	Primary Material	40252

If stock rolls were selected the system will automatically allocate them to the work order.

Master Roll Work Order

If no manufactured stock rolls are assigned a work order to manufacture the master roll will also be created when the 'Generate Work Orders' button is selected. If the master roll is purchased (no MFG # is assigned to it) then it will display in material requirements if there is not enough on hand.

If the 'Inline' box is checked for the pattern only a manual Extrusion work order will be created (not a Slitting work order).

Note: When making a manual work order for a Slitting item it must be done via the Slitting Optimizer module.   Trying to create one via the work order module will not work.

Production Reporting Notes

The Production report will have Total Lbs in the top grid populated based on the weight of the master roll.

The system will calculate the unreported rejects on a line by line basis: Total Lbs - $\sum (k=0)$ ^ n [(Good Parts + Rejects)=Unreported Rejects]

Slitting Example

This section provides an example of the minimal setup entry information required to create work orders from the Slitting Optimizer for the Slitting Manufacturing Type.

The values in the screenshots can be used to test the slitting functionality to gain a better understanding of the functionality.

Setup

Create Slitting MFG Type

1   From BOMs->Configure menu or System Parameters->Lists – access Manufacturing Types

2   Select the insert button and choose the Slitting Mfg Type from the list.

Default UOM - This field on the General tab is unique to the Slitting MFG Type. A UOM based on weight or length can be specified. This setting affects how the BOM, Work Orders, Production Report and RealTime™ displays UOMs. When a new BOM is created the system will look at the Mfg Type's Default UOM to determine if the BOM is weight or length based, and will use the UOM on the BOM when adding new BOMs.

For this example LBS is being used.

Create a Work Center for the Slitting Manufacturing Type

1   From the Work Center module create a new work center

2 Choose the Slitting Manufacturing Type (and optionally a Mfg. Cell if one was created).

3 Enter the basic information such as Work Center #, Description, Center Type, etc.

Create new Inventory Class for Master Rolls (optional)

1 Go to: Inventory->Miscellaneous Menu->Inventory Classes

2 Select the insert button and enter a new Class. For example 'MR'

3 Mark the new class as 'Primary Material'

Create Master Roll Inventory items

1 From Inventory create a new item for the master roll with a UOM in LBS.

2   Click the button 📐 to access the Physical Characteristics, and enter the details for all fields except Volume which is calculated by clicking on the green arrow.

Note: The unit of measure defaults to inches but can be changed by selecting '**Physical Characteristics UOMs**' from the Physical Characteristics File menu**.**

Create Slitting BOM

From the BOM module create a new BOM using the Slitting Manufacturing Type.

1   Enter the Mfg #

2   Select the item to be used as the Master Roll in the 'Material Spec.' field. The Gauge, SPG, Core Size, and Outside Diameter will populate automatically from the item master (based on the information from the Physical Characteristics).

3   Min and Max width should be set to actual width of master roll.

4   Enter the Trim width. This information carries over to the Slitting Optimizer.

5   Select the Line Size (work center) from the pick list.

6   Enter the Feet/Lb and Lbs/Hr

7   Enter the Setup Hours 1

8   Check the 'Agg Demand Collector' button to utilize the Slitting Optimizer in the work order. If this is not checked intermediate work order are not created, just the final work order based on demand.

9   Optionally enter information in the other fields such as Setup Hours 2, Labor, etc.

Item Details

From the Item Details tab on the BOM create all of the inventory items that can be produced by the master roll specified on the General BOM Info tab. In the example below four different items can be manufactured using this BOM.

1 Select the Insert button and choose the Class from the drop down list (in this example MR).

2 Enter the Item #, Unit of measure (LBS), and Description

For Mfg. Type's with the Default UOM set to weight, the manufactured item will include Slit Roll Weight and Width.

3 Enter the Slit Roll Weight – for simplicity in this example this is set to 1 LB.

4 Enter the Slit Roll Width. This is the width that the roll will be cut and is used in the Slitting Optimizer when creating the work order(s).

Note: The Slit Roll Weight should be equal to 1 of the UOM of the FG item.   Example: If a Roll weighs 1 KG, and the BOM is in Grams, then the slit Roll Weight would be 1000 Grams.

Note: Patterns Std and Patterns Act are for costing purposes only. They will carry through onto the ADC work order as cavitation, but they will not automatically pull into the Slitting Optimizer. They need to be manually added as multiple Slits.

Enter the Item's Physical Characteristics

1 From the BOM, right click on the item that was just created and Jump to Inventory.

2 Click on the 📝 button to access the 'Edit Physical Characteristics' form and enter all of the details.

Note in this example the Slit Roll Width and the Width are both 20".

Continue adding additional inventory items that can be made with the master rill using the steps above.

In this example there are four items all of different widths (20, 80, 60, and 40 inches):

Once these setup steps have been completed continue with creating demand and utilizing the Slitting Optimizer.

Create demand by Creating a Sales Order

1   Enter a sales order for any or all of the items associated to the Slitting BOM.

2   Run Update Schedule

Work Order

Assuming no on hand for the item on the sales order a work order will be created.

Slitting Optimizer

Access the Slitting Optimizer by clicking the [icon] button on the work order, or by accessing the module from the Manufacturing tab of the Launcher Bar.

The form will include the Work Order and Material Summary details. The Patterns, Satisfied Orders and Stock Rolls sections will be blank.

Patterns

From the Patterns section select the + button to add a record. This initially populates with the information from the BOM (roll width, trim width).

Satisfied Orders

This is where the user defines what the pattern will look like and manually select which demand will be fulfilled. The goal is to define a pattern such that off-cut (i.e. unused width) is minimized.

From the Satisfied Orders section select the + button to add a record. The Add Items form will appear:

- Select from the 'On Order' tab to satisfy demand requirements from sales orders. If the 'Hide Fully Satisfied Orders' button on the On Order tab is pressed when adding an item in the Satisfied Orders section, only orders that have demand that has not already been completely added to a pattern are visible. Toggling the button will show all items with demand regardless of whether they have already been added to a pattern.

- Select from the 'All Items' tab to create items to be stocked for future demand (Make-to-Stock).

ACD BOM

- In this example the SR-01 20 IN and the SR-03 60 IN were selected.
- The number of slits for the SR-01 20 IN item was changed to 2 so the Part width equals the Roll width so there is no unused width.

The total manufactured quantity for SR-01 is less than the demand of 100, and it is greater than the demand for SR-03.

From the Slitting Optimizer different or additional configurations can be created in order to optimize the best usage of the roll and meet the demand.

Once satisfied with the selected pattern(s) click on the 'Generate Work Orders' button.

The line in the Patterns section will display in green indicating a work order was generated.

The work order generated will be a Firm work order with a substitute BOM assigned. The items will be those selected in the Satisfied Orders section.

Thermoform - General BOM Information

The following information is specific to the Thermoform Manufacturing type. There are two manufacturing types for Thermoform, THERMOFORM and TFORM2.   The main difference between TFORM2 and THERMOFORM is that in the TFORM2 MFG Type the sheets have a native UOM of each and they are dispositioned in each.

The sample below shows a completed Thermoform configuration. This is the main entry screen for building a BOM for a Thermoform standard.

The following field listing details the information that is required for each Thermoform configuration. The information in the field listing has been broken down into separate sections (corresponding with your screen) for easy reference. Use the field listing to familiarize yourself with the data fields prior to making any entries.

BOM/Standards Info

Mfg #	Up to 50 characters can be entered in this field. The number entered here is the number of the actual standard. This number must be UNIQUE.
Customer	This is not a required field, but is often used to associate a job with a particular customer. If you are a proprietary producer, you may leave this blank or list your company as the owner. To select a customer, type in the first couple of letters of the customer's name and the system will hyperbrowse to that customer. Another method is to select the customer from the pick list near the customer field.
From RFQ #:	**Request for Quote Number**. The information displayed here originates from the Quote module and will only be present if the standard was converted from a Quote. This field cannot be edited.
BOM Control #	The BOM Control number will change automatically when someone makes a change to the configuration. This field cannot be edited. This field will not update immediately. In order to see the change, the user would have to exit the BOM module and come back in. The field consists of today's date, time and **EnterpriseIQ** user ID of the person who made the change. Note: Changing the Lot Number will not update the BOM Control Number.
Schedule Info	The user can enter up to 250 characters of information that will display when a work order is scheduled to a work center that uses this BOM. The information can be printed using the Print button from the BOM or from the schedule.
EPlant Name	This field is used to designate the configuration to a specific EPlant. It is not a required field if EPlant is not being used.
Inactive	A BOM can be marked inactive. This will 'hide' the BOM from pick lists. To view an inactive BOM the pick lists have a new button in the upper right corner to 'view inactive' items.
1st Article Ins Date	Enter the First Article Inspection date using the drop down calendar (Optional). This is the date that the configuration was first approved for use in a production run. This field is for information purposes only. This field description can also be changed by right clicking on the field and selecting the Define Label Text option. Enter in a user defined caption in the New Value field. The customized caption is based on Manufacturing Type. If the caption is changed for an Injection BOM, all of the Injection BOM's will have that same caption but not other types of BOM's such as Generic.

Material/Regrind

Material Spec.	This field is used for selecting the material that will be used for this job. This section has two fields--one will list the material item number and the other will fill in with the description. The user can "Jump to Inventory" by right clicking of the material description field. Use the Jump To function to make changes to that item, check quantities on hand, etc. When creating a new primary material to be associated to a TFORM2 BOM, the only unit of measure available to select will be each.
EPlant	The EPlant information associated with the material.
Gauge	The gauge of the raw material. This will fill in based on the gauge associated to the attached material. If the gauge of the attached material is changed in master inventory, the system will ask the user if the change should be propagated to all of the BOMs that use the material. Security can be placed on the pop up message. This field can be changed for the specific BOM without affecting the default gauge value associated to the raw material.
SPG	The specific gravity of the raw material. This also populates automatically based on the SPG associated to the Material Spec. If the SPG is changed on the raw material it will also change on the BOM and the BOMs sheet weight and production summary will be recalculated.
Tool Width	The width of the tool. This is entered on the General tab for THERMOFORM. If the specified material has this information set in the UOM Conversion Factors in inventory, that value will populate this field if it is zero. If this field already has a value the system will not overwrite that information. For TFORM2 this value only comes from the specified material. (It is entered in the UOM Conversion Factors form in Master Inventory).
Rail	Optional.The rail material on the sides used to align the sheet to the tool.
Tool Length	The length of the tool. This is entered on the General tab for THERMOFORM. If the specified material has this information set in the UOM Conversion Factors in inventory, that value will populate this field if it is zero. If this field already has a value the system will not overwrite that information. For TFORM2 this value only comes from the specified material. (It is entered in the UOM Conversion Factors form in Master Inventory).
Clamp	Optional. The clamp material on the end used to align the sheet to the tool.

Sheet Weight	If **Imperial** is selected in the Regional settings the calculation is as follows:
	Thermoform: Sheet Weight = (Width +Rail) x (Length + Clamp) x SPG x Gauge x .0361.
	(Multiplied by 453.59237 if the UOM is in grams).
	TFORM2: Sheet Weight = Width x Length x SPG x Gauge x .0361.
	(Multiplied by 453.59237 if the UOM is in grams).
	If **Metric** is selected in the Regional settings the calculation is as follows:
	Thermoform: Sheet Weight = (Width +Rail) x (Length + Clamp) x SPG x Gauge.
	TFORM2: Sheet Weight = Width x Length x SPG x Gauge.
	Note: The Native UOM selected in System Parameters will display next to this field.

BOM Manufacturing Details

Mfg. Type	This field shows the TYPE of manufacturing this standard will be used for. Cannot be edited.
Cell	Manufacturing Cells are associated to specific MFG Types and are used to designate separate areas in your facility. Manufacturing Cells allow a logical grouping of work centers. Group work centers by location, product line, process, etc… for separate scheduling and production reporting.
	Cells are discussed in the Setup Manual under **Manufacturing Cells**. Refer to that section for more information.
Center Type	**Required Field.** The entry here is based on the TYPE field in the Work Center module.
	This field links the job to a particular type of work center, though it does not necessarily link it to any one specific work center. Conceptually, **EnterpriseIQ** needs to know what kind of work center is used in the production of the item. It does not need to know specifically which work center. Assigning a specific work center is done during scheduling, where the user will have many options when placing the job in a particular work center queue.
	The machine scheduling portion of **EnterpriseIQ** will group production jobs together according to the type, though the user can override this behavior.
Cycle Time	**Required data**. This field is the time, measured in seconds, from the start of one shot to the start of the next shot. **EnterpriseIQ** will convert cycle time in seconds to shots per hour on all production reports.
	Seconds per cycle can be calculated from parts per hour by this simple equation. Divide parts per hour by the number of cavities in the tool, then divide 3600 by that number to achieve cycles in seconds. Conversely, shots per hour is calculated by dividing 3600 by the seconds per cycle.
	NOTE that **EnterpriseIQ** supports an efficiency factor which can be used to alter the *net shots per hour* value (see below for more information).

Labor	This is the labor required at the press to run this operation. This field is used to compute the labor hours required to complete the work order. To enter the required labor click on the ellipsis button in the labor field and the following form will appear:
	From this screen click on the **ADD (+)** button, enter in the quantity of operators required (this does not have to be a whole number) then select the Employee Level Code from the drop down list. The Labor Rate will fill in with the rate associated with the code.
	The user can select multiple labor codes and associate fractions of operators per code or multiple operators per code.
	EnterpriseIQ supports a range of 0.00 to 999 operators per job. A number less than 1 can be used for jobs running automatically and an operator is not always at the press. For these tools, a partial number such as 0.5 is entered depending upon the number of machines the operator is tending.
	The Employee Levels list is created in Sys Setup->System Parameters->Lists. An unlimited number of employee levels may be created for use in the BOM module. The system comes with a Default labor code.
	If the Default labor code is selected the system will use the labor rate associated with the specific BOM (BOM->Options->Misc Parameters->Labor tab). If that is blank it will use the labor associated with the Manufacturing Cell. If the cell does not have a labor rate associated with it the system will use the labor rate associated with the Manufacturing Type.

SetUp Hours 1	This is the typical time in hours required to set up the tool. Use a close estimate, but remember that it could vary from time to time based on the previous job. The schedule will add this amount of time to each work order, or bucket, for this configuration.
	This field can also be used to determine the set up cost portion for a manufactured item. Setup Labor can be broken out on the standard cost of a manufactured item. This option must be turned on in system parameters (**Sys Setup->System Parameters->Inv Setup tab**). When activated, the user can add a cost element and type to an employee level. There are two supported types: Setup and Production. When the standard cost is calculated the system will check to see if this option is on and if so will break out the labor costs to the cost elements attached to any employee levels on the BOM. For "Production" types, the calculation will remain as is. For "Setup" types, the system will look at the number of setup hours 1 on the BOM times the number of operators for that type times the rate for the employee level divided by the standard run qty.
	Please see the Standard Cost section or the Inventory section for more information on the standard set up cost.
SetUp Hours 2	This field is used in the schedule when the same tool is running consecutively in a machine instead of Setup Hours 1. If the same tool is running back to back in a work center the Setup Hours 2 value will be used instead of Setup Hours 1. For example, this value can be set to zero and if the same tool will be running back to back the schedule will not add the set up to the schedule which will provide a more accurate end time for the job.
Scrap%	This is the estimated amount of scrap that the production process itself will generate. This is used in calculating the extra production time and extra material you will need.
	Try it yourself. Leave this field empty and note the Net Cycles per hour calculation displayed on the bottom right portion of the screen. Change the scrap rate, press the Refresh navigator button and note the new Net Cycles per hour figure.
	Because each configuration can have it's own scrap rate, you should not include any other anticipated scrap usage here. **EnterpriseIQ** will calculate the total of all the rates and add the yielded scrap back into the job prior to production.
UOM	Unit of Measurement (i.e. feet, inches, meters). This UOM defaults to the UOM set up in the **Quote** module under **Misc/Rates and Parameters**.
Eff. Factor	You can adjust the total time required to produce the part with this field. Enter an efficiency factor that accounts for production problems that effect overall performance.
	Entries made here will affect the Net Feet/hr and Feet/K fields in the Production Summary.
	This field is used to calculate the *assumed* production time.
FG Lot #	This selection allows the user to assign a Finished Goods lot number to the configuration. For additional information on this field, please see the **Finished Goods Lot Number** section.

Assy @ Mach.	This not applicable to the Thermoform MFG type.

Item Details tab for Thermoform MFG Type

Class	Shows the class of the item that you are adding to the BOM. When you first enter this screen, the class field will default to 'FG' for Finished Goods item but can be changed by selecting a class from the drop down list.
	The master class list can be accessed by selecting the button next to this field.

Item #	Enter in the inventory item part number. This number must be unique.
	Note: If the 'System-Generated Inventory#' option is enabled in System Parameters->Sequential Numbering tab, the system will populate the item number with the next sequential number. If the user clicks on the 'Pick Item' button and clicks 'New' on the pick list, the item # will be the same as what was generated. For example, if the next sequential item was '123', when selecting 'New' on the pick list it will still be '123'. The value can be overwritten if desired.
Rev	This field is optional though very important for tracking revisions to parts. It is used to distinguish between similar part numbers. (**EnterpriseIQ** sorts and stores unique part numbers based on Class, Item Number and Rev). You can use it to track any revisions made to the part and can also be retrieved in reports.
	The information can be typed manually or selected from a user defined list. To create the list right click on the Rev field and select 'Edit User Defined List'. Select the **+** button and enter the text. (This field is only 15 characters - any additional characters entered will be ignored).
Unit	This is the Unit of Measurement. Defaults to EACH.
Description	Enter a short description or common name of the item. The description entered here will be used throughout the system to identify this item. If producing the same part in different colors, we suggest you include the color in the item description.
Ext. Description	Second part description field—use up to 100 characters for the description.
Item Weight	Enter the weight for a single item. The weight will be shown in either pounds, grams or ounces (the system defaults to the UOM set up in the Quote Module under Misc/Rates and Parameters or if the default UOM was overridden it will look at what you entered in the UOM field on the general BOM screen). Do not multiply the weight by the number of ups.
	Note: For users installed before version 2011, updating the Item Weight on the BOM modifies the Weight field in Inventory > Additional tab. For versions after 2011 this field will not populate the inventory weight field, but if for some reason this is a requirement please contact DELMIAworks support and the required trigger can be provided.
Actual & Standard Up	The Standard Up is the number of items produced during the cycle. The Actual Up is how many ups in the tool for the item are functioning.
	Actual Up is used to determine how many shots are required on a production run. The calculation is the number of Items Required divided by the Actual Up.

Item Information

Field	Value
Item #	T 021609
Description	T 021609
Ext. Description	
Default BOM #	T 021609
Class	FG
EPlant	1
Revision	
Item Weight	25
Std Up	1
Costing Weight	202.98661407 (gr)
Act Up	1
Sheet Weight	589.485564
User Numeric	
Skeleton Weight	504.485564
Drawing	
ECNO	

Attached Materials | Details | Documents | User Fields

Field	Value
Operation	Attached Components [165321]
Item #	BYPROD
Description	BY PRODUCT
Ext Description	
Class	PL
EPlant	1
Revision	
UOM	GR
Parts Per	-177.986614

☑ By Product

Item Information

Field	Value
Item #	B 021609
Description	B 021609
Ext. Description	
Default BOM #	T 021609
Class	FG
EPlant	1
Revision	
Item Weight	30
Std Up	2
Costing Weight	207.98661407 (gr)
Act Up	2
Sheet Weight	589.485564
User Numeric	
Skeleton Weight	504.485564
Drawing	
ECNO	

Costing Weight	The costing weight is used to determine material costs for standard costing purposes. It equals the Sheet Weight divided by the standard ups plus the item weight. If the 'Include scrap in By-Product weight calc' option is checked for the MFG Type then it is: ((Skeleton / Total Std Ups) + ((Sheet / Ups) * scrap%)) + Item Weight.

Example (using screen shots from above with 5% scrap):

((504.485564 / 3) + ((589.485564 / 3) * .05)) + 25

= 168.16185 + 9.82476 + 25

= 202.9866 |
| **Sheet Weight** | The calculated Sheet Weight from the General BOM Info tab |
| **Skeleton Weight** | Skeleton Weight = Sheet Weight - (Part Weight(s) * Up)

Example (using screen shots from above):

589.485564 - ((25 x 1) + (30 x 2)) = 504.485564 |
| **User Num** | On this screen there is an additional field called User Num. This field is only used for EDI or Crystal reports. (The field is in the table Partno and is called Nuser1). |
| **Drawing No.** | **Optional**. The number entered here is used to track the drawing number for the part. Use up to 30 characters. |
| **ECNO** | **Optional**. This user defined field normally carries an engineering change number, but it can also be used to hold additional information about the part, such as a UL number.

Note: This field will not exist for users with the Engineering Change Order (ECO) Quality module. |

Attached Materials

By Product	To add a By Product select the speed button next to the Skeleton Weight field. The By Product pick list will appear to choose from or select New to create a new By Product inventory item. The Quick Add form will appear to enter the By Product Item Number, Description, Rev, unit of measure, etc. The Class defaults to PL.

If a By Product item is created based on the Skeleton Weight the By Product box will be checked. It cannot be manually checked or unchecked.

During Production Reporting both items will   be dispositioned into inventory.

Note: The value of the skeleton (By Product) does not impact the standard cost of the manufactured item. |

Parts Per	The calculation for the By Product Parts Per is dependent on whether the' Include scrap in by Product weight calc' option in MFG Types is checked or not.
	When 'Include scrap in by product calculation' check box is *not* checked:
	1 By-Product = Skeleton / Ups
	When 'Include scrap in by product calculation' check box is checked:
	1 By-Product = Skeleton / Ups + ((Sheet / Ups) * scrap%)
	(The scrap % comes from the General BOM Info Scrap % field).
	This will be a negative value so that it is put into inventory during dispositions
	Example using screen shots from above:
	((504.485564 / 3) + ((589.485564 / 3) * .05))
	= 168.16185 + 9.824759
	= 177.98661

Treatment

The Treatment manufacturing type is used for processes such as heat treatment and annealing where multiple items are processed at one time. All items that require a specific Treatment are included in a single BOM.

Steps to implement the Treatment Manufacturing Type:

- Create a Treatment Manufacturing Type and optionally Manufacturing Cell(s) associated to the Treatment Manufacturing Type. (Refer to Manufacturing Types and Manufacturing Cells for details).
- Create Work Centers for the Manufacturing Type and cell(s).
- Create Treatment BOM(s)
- Enter the inventory items loose volume in BOL Data

Treatment Work Centers

The fields for a work center associated to the Treatment Manufacturing Type are the same as other types of work centers with the exception of the Center Usable Volume.   This field is used to determine the volume in cubic inches that can fit in a single cycle. The system will use the Inventory item's loose volume (BOL data) to evaluate the items that can fit in the work center.

Refer to the Work Centers section for more information on other fields.

Work Center: TR01 - TREATMENT 1

File   Options   Reports   Help

Work Center | User Fields | User Defined Form | Documents

Work Center Description

Work Center #	TR01	Manufacturing Cell	PASO TREAT
Description	TREATMENT 1	Manufacturing Type	TREATMENT
	■ Inactive	Center Rate	
Center Type	TREATMENT	Center Usable Volume	7776
EPlant Name	PASO PLANT	Setup Hours	1
Capacity	4.5	Time Fence	
Snap to Last Job		Exclude from Auto Load	■
Plug Value		Exclude from MRO	■

General | Reject Codes | Downtime Codes

RealTime Information

RT Server Prefix	
Center RealTime Address	
Center Scrap Address	
Monitor Service Group	
RTLabel Group	

Connected to RT Server   ■
RTServer is not signaled   ■
Floor Backflush   ■
Floor Actual Material Usage   ■
Log Cycle Times   ■
Connected to Wireless LightStick   ■

Center Cost

■ Use Master Center Type Cost Settings

Variable Overhead Center Cost   30
Fixed Overhead Center Cost   5

Description	Variable Cost	Fixed Cost
▶ Overhead	30	

Note: The TREATMENT MFG Type is not RealTime™ compatible.   It can be used with non-signaled RealTime™, and will correctly produce a production report when a shift changes or when the job is removed from first position.

Treatment BOM

Specific fields for the Treatment BOM:

- Treatment Information - 2000 character field to enter the treatment instructions.
- Load Time Hrs - The number of hours to load the work center.
- Unload Time Hrs - The number of hours to unload the work center.

Both times will be added to the Production Hours calculation for each cycle required.

Note: The Cycle Time defaults to seconds for the Treatment MFG Type but can be changed to a different unit of measure such as hours or minutes in the User Defined Conversion Factor option in Manufacturing Types (See Manufacturing Types for details).

Note: Treatment BOM's production hours on work orders are not adjusted by the scrap %.   The production hours calculation for the Treatment Mfg type is cycle time + load time + unload time. If parts are scrapped, another full cycle time needs to be run.

Note: Treatment BOM's do not have an Eff. Factor field as it is not relevant to this manufacturing type.

Production Summary:

- Cycles/Hr - 3600/Total Cycle Time
- Hours/K-cycles - 1000/Cycles/Hr
- Total Cycle Time Hrs - Cycle Time + Load Time Hrs + Unload Time Hrs

Example: Using the screen shot above where the Cycle Time is in minutes:

- Cycles/Hr = 3600/3600+1800+1800 = 0.50 (Total Cycle Time converted to seconds)
- Hours/K-cycles = 1000/0.50 = 2000
- Total Cycle Time Hrs = 1 +0.5 + 0.5 = 2

Item Details:

All items that require a Treatment based on the BOM (specific treatment information and cycle time) must be included on the item details tab (like a family tool).

Update Schedule and Work Orders:

When Update Schedule runs, for planned work orders only the items with outstanding demand will be added to the work order. For manual work orders, all items on the BOM will be added to the work order.

The work order processing will calculate the total cycles required for all demand by multiplying the demand quantity for each item times the Loose Volume.

Work Order Cycles Required =   the Total volume of all items attached to the work order / Work Center Usable Volume

Work Order Production Hours = Cycle Required * (BOM Cycle Time + Load Time Hrs + Unload Time Hrs)

Example:

- 2 item's on work order with demand, each with an Item Volume = 10, and demand = 1000 for each item
- Work Center Usable Volume = 10000
- Cycle Time on BOM = 1 hour

Work Order Cycles Required = (1000 * 10 + 1000 * 10) / 10000 = 2

Work Order Production Hours = 2 * (1 hour + 0.50 Hour + 0.50 Hour) = 4 Prod Hrs

Note: The system calculates how many cycles will be required to process all the items with demand based on the volume and work center capacity, and creates a single work order. The decision of which items to run in each cycle is up to the operator.

Note: The system will evaluate the MFG Run Size to determine if the parts should be bucketed.

Scheduling and Production Reporting

TREATMENT Work Orders are finite schedule based on Production Hours on individual TREATMENT Work Centers.

The TREATMENT MFG Type is not RealTime™ compatible.

Only the items that have demand are evaluated for material exceptions.

Production Reporting will report how many of each item in the TREATMENT Work Orders have been processed.   The pre-treatment item # is backflushed to the Treated Item #.   When Update Schedule runs the Work Order Cycle Req and Production Hours will be reduced by the production that was reported.

Visual BOM Routing

The **EnterpriseIQ** Visual BOM Routing module is a tool which enables the user to create bills of manufacture in a more visual way or view existing BOM's visually. This option is very similar to the Routing Diagram option available from the items details tab of a BOM except the Visual BOM Routing module has add and edit capabilities.

From this screen the user can create the BOM's for the entire routing process. To create a BOM Routing diagram you start at the end of the process and work your way to the beginning routing steps required to make the final item.

Overview

The basis of the **EnterpriseIQ** Visual BOM Routing module involves creating a routing structure for products that you run in your facility. This module is used to create routing diagrams for repetitive type manufacturing processes.

Below is an example of a Visual BOM Routing diagram:

Creating a New Visual BOM Routing

To create a new BOM Routing diagram go to the Visual BOM Routing speed button on the main launcher

bar [ ]. Click on the New button on the pick list and the following screen will appear:

From this screen you may choose a Mfg Type and cell you want the BOM assigned to.

Once a Mfg type (and optionally a cell) has been selected the appropriate configuration screen will appear based on the manufacturing type selected. Enter the BOM information in as described earlier in this document.

Once the information is entered, click on the OK button and the BOM Routing screen will appear showing a blue box with the basic information regarding the operation. Below is an example:

This box shows the work center type, Mfg #, a calculated rate per hour based on the cycle time in seconds (The calculation is 3600/cycle time in seconds), and the Item #.

Primary Right Click Options

You can also access Visual BOM Routing functions quickly and easily by right clicking a BOM. Doing so will open a list of possible actions, which are listed below:

- **New Routing BOM** - With this option, the user can create a new Routing BOM diagram via the right click rather than the speed button.
- **Cost/Quote** - With this option, the user can access the Cost/Quote calculations associated with the given BOM in a separate window.

Adding Additional Routing Steps

To continue creating associated BOM Routing steps, right click and choose **Add Routing BOM**. Choose the Mfg Type and cell (optional) then fill in the fields on the form with the information for the step. An unlimited number of BOM Routing steps can be created.

Other Right Click Options

- **Add Routing BOM(s) Like** - This option allows the user to 'clone' a BOM and add it to the routing diagram. After selecting this option a Routing Diagram pick list will appear. The user can double click on an item to view it's routing diagram. Once the desired step is found, drag the step(s) from the pick list and drop it onto the step it will follow in the visual routing diagram. A 'List of items to be cloned or reused' will appear. Enter the desired Mfg#, Item #, Rev, and Description.

Note: To add existing BOMs (not cloning) to the routing diagram use the Components option (discussed below) and select a FG or WP item as the component.

New LIKE

From the **File** menu users can select **New LIKE** to clone an entire routing diagram. Users can select from existing diagrams or portions of a diagram and clone the routing steps into different Mfg #'s. The Item numbers, Description, and Revision level can all be changed as desired. All processes attached to the source routing steps will carry over to the new routing steps.

- To use the **New Like** feature go to Visual BOM Routing from the launcher bar and select any Mfg # from the pick list, the Visual BOM Routing screen will appear.
- Select **New Like** from the **File** menu and a Routing Diagram pick list will appear:

This form is a pick list of all existing routing items (BOMs). The left side lists the routing diagrams and the right side will display the visual routing diagram associated with the selected item. The user can choose to display only the top level items by checking the box next to Top Level. If the box is not checked all routing items will appear in the list. Note that the top level items are in bold. The Show all check box can be checked to also display inactive configurations.

To view the visual routing diagram for a particular item double click on the item and the visual information will appear on the right side of the form. The line item that the visual information is displayed for will be gray. This way the user will know which item the visual routing diagram displayed on the form is for.

Select a routing diagram that you would like to clone. Highlight that line item and then drag and drop the information from the pick list to the Visual BOM Routing by holding down the left mouse button.

A 'List of Items to be cloned or reused' will appear.

From this grid users can edit the Mfg #, Item #, Rev, and Description fields for the new BOM(s). By default the grid will leave the highest level New Mfg # blank and fill in the others with the same information as the source routing steps. Users can determine which Mfg #'s to reuse or create as new ones. If the information in the 'New Mfg #' field remains the same as the source steps (BOM Tree field) the system will assume those BOM's are to be reused. If different information is entered in the New Mfg # field the system will create a new BOM. Simply type over the data in the 'New' fields to change the information.

Note: If a new Mfg # is created and the Item # is not changed the system recognizes that the item can be produced using either Mfg # (the original one or the newly cloned one). The Default Mfg # associated to the item will stay as it was prior to creating the new Mfg # but can be manually changed by going to the Inventory Module->Manufacturing tab.

When cloning the BOM any attached Processes will be reused. Once all the data has been entered select OK and the new routing diagram will appear.

- **Edit Routing BOM**- This function brings up the BOM for editing purposes.
- **Delete Routing BOM** - This function will delete the BOM Routing step (blue node) that is right clicked on and all of it's attached steps. This only removes the routing step(s) from the diagram it does not delete the BOM(s). A pop up screen asking if you are sure will appear. To delete the step(s) click on the Yes button. The top blue node can only be deleted if there is no quantity on hand. If attempted for a BOM with associated on hand inventory, the user will receive a message similar to the following: "Unable to Delete Item - On hand quantity found. Unable to delete item(s). Details - The following item on hand quantity is not zero: 08092-102, Routing # 0".
- **Routing Notes -** This brings up the Routing Notes for the routing step. This is a 2000 character note field used for work instructions for routings. This information will print on the Routing Packet report available in work orders.
- **Components** - This function enables you to add any components from your master inventory. After selecting this function the following form will appear:

To add a component from inventory, click on the **ADD (+)** key then double click in the Item # field. Click on the ellipsis button in that field and the following screen will appear:

Add Components

Item #	C.. ▾	Rev	Description	Ext Description	U
W8650-M	IN		HARDWARE KIT, WAGON H	MEDIUM, BLACK	E
W4800-M	IN		WAGON HANDLE, BLACK	MEDIUM	E
IN-000300-2BR	IN		INSERT 6035-2BR X .185		E
IN-1200-BOBBIN	IN		BRASS BOBBIN INSERT		E
IN-1210-SPRING	IN		SPRING STAINLESS STEEL		E
D5200BS	IN		SHORT 5200 BAYONET		E
D5200BM	IN		MEDIUM 5200 BAYONET		E

Type Components

OK   Cancel   New

This screen is a list of all items in your master inventory. To add a component such as a finished good, WP item, raw material, additive, insert, etc. Highlight the item on the list and click OK. To add a packaging item change the Type to Packaging using the drop down list at the bottom of the form. Once an item is selected, you will be returned to the Component form and the Type, Item #, Description, and Unit fields will be filled in with the information from master inventory. Complete the information by filling in the Parts Per (the parts per will default to one), Overlap Hours, and Scrap information for the component or Packaging Sequence # and Scrap% for a packaging item. Overlap hours are the number of hours you can overlap with the Routing step above. Scrap% is the anticipated percent of scrap for the item you will make performing this operation. The Packaging Sequence number is related to the bill of lading, make the largest packaging item (or the one you will be putting on the BOL) sequence # 1.

When a finished good or work in process item is chosen the attached materials associated with its BOM will also appear on the BOM Routing form.

- **Processes** - This is only available for ASSY manufacturing types. To add/edit other types of second operations, use Jump to BOM, and select Add Operation. For ASSY manufacturing types, this option allows the user to add processes to the routing step. Processes are steps that are not scheduled but are tracked using the Assembly Track and AssyData modules. From the Processes Maintenance module users can create an unlimited number of processes that can be associated to ASSY BOM's. (For more information on Processes please see the Assembly Manufacturing documentation).

- **Expand** - This right click function opens up the colored box that was right clicked on to show additional information about the routing step. In addition to the four fields shown on the non expanded box, you will see the Item Description, Parts Per, Required, On Hand, and Non Committed. For purchased items the lead time will also display.

Under **Options**, Toggle Expanded allows the user the choice to be able to expand multiple windows or only one at a time. With this option checked, only one box may be expanded at a time. With this option not checked, multiple boxes may be expanded and open at one time.

- **Jump to Inventory** - This function will take you to the Inventory screen for the item that was right clicked on.

- **Jump to BOM** - This function will take you to the BOM screen for the item that was right clicked on.

- **Jump to Exception List** - This function will take you to the material exception list for the item that was right clicked on. If the item is not on the list a pop up form stating so will appear.

Color Coding

Each type of attached operation/component has a corresponding color associated with the information box.

- Blue - represents a BOM / Routing.

- Purple - is the Primary raw material.

- Green - is a Purchased Component.

- Yellow - is a packaging item.

- White - is a purchased component used in a sub-operation. A sub-operation is an operation attached to an existing BOM which has been attached to the BOM Routing. If components are attached to this sub-operation they will show in white.

- Medium Blue - is an Outsourced BOM.

- Gray - is a Process.
- Light Blue - is an Assy Process

Once a Visual BOM Routing diagram is created, all of the steps are treated like traditional BOM's. Sales Orders may be added for the item. Work Orders will be generated, and the operations may be scheduled.

Print Visual Routing

The user can print the BOM Tree Visual report from the printer speed button. This will print the report to the printer. (For more information on the Printer Speed button see Speed Buttons).

Note: To print a report from the reports menu you must print through the speed button first each time you want information for another BOM. Or if you modify a BOM you will need to print it again through the speed button to refresh the data in the c_bom_depend_flat table. The report does not have to actually be printed, you can select Cancel on the Print form and the table will still be populated in order to print to screen from the reports menu. Each time the table is populated the system will delete data three days or older.

Note: When printing the visual bom routing there is a package that gets executed that populates a composite table C_BOM_DEPEND. This table populates the multiple levels of a BOM into one table allowing report writing to be easier. This package is an "execute before print" action so that it can be set up at the report level to eliminate the need for sub reports.

Main Item Cost/Quote in Visual BOM Routing

Once all of the steps for a Routing operation have been created the user may calculate the costs and input a mark up % that can be used in reports.

Select the Cost/Quote speed button [icon] to access the form. This is basically the same Cost Calculations form which is accessed from the Standard Costing tab in inventory. The only difference is the addition of the % Markup and Quote Total columns.

From this screen the user can calculate costs for the item based on the routing steps set up. A quoted price can also be calculated based on a user-defined mark up. The mark up is based on a percentage or points.

To specify how the markup will be calculated select **Options > Parameters** from the menu and the following screen will appear:

The markup will either be calculated based on a Percentage or Points.

Mark-up By

Percentage	The Percentage function takes a certain percentage of the cost, and adds that value back to the original.
	Example:
	Item cost is $1.00 with a 25% percentage markup calculates to $1.25 (1.00 x .25) + 1.00 = 1.25.
Points	The Points function increases the total cost by the percentage used. This is accomplished by dividing the cost by the percentage.
	Example:
	Item cost is $1.00 with a 25% Points markup calculates to $1.3333 (1.00 / .75 = 1.3333).

Decimal Precision - From the Parameters screen the user can also specify the Decimal Precision for the quote price. The system defaults to six decimal places but can be changed by typing in the desired decimal precision. The allowable decimal range is from 0 - 6.

Entering % Markups

After selecting the single calculator button the system will populate the Future Cost column. To create a quote price enter a value in the % Markup column for each cost source to be marked up. The system will calculate the Quote Total column based on the selected 'Markup By' parameter. The Quote Total information does not carry over to master inventory. The information can be added to reports and printed prior to rolling the costs.

For more information on calculating standard costs for manufactured items please see Standard Costs for Manufactured Items.

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