Infor CloudSuite Business Inventory Control and Material Planning User Guide

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About Non-Inventory Items

A non-inventory item is a product that is purchased, sold, or used, but is not tracked. These items are managed on the Non-Inventory Items form, and may be used on many other forms.

General Ledger Accounts

The general ledger account used for these items is defined in the Sales Non-Inventory field, on the Accounts Receivable Parameters form.

- Customer order lines containing non-inventory items default to the account specified in the Sales Non-Inventory field.

- Purchase order lines containing non-inventory items default to the vendor purchasing account, if specified. If no purchasing account is specified for the vendor, the Accounts Payable Purchasing Account is used.

Adding an HTS Code

1   Open the Harmonized Tariff Schedule Codes form.

2   Click the Filter in Place button to get out of Filter in Place mode.

3   Click the New button in the toolbar to create a new object.

4   Add the HTS code to the HTS Code field. This field is not validated in any way, and the field accepts any characters.

5   Tab over to the Description field.

6   Add a description of the HTS code.

7   Save the record.

HTS codes added on the Harmonized Tariff Schedule Codes form are immediately available for selection in the HTS Code field on the Items form.

Managing Non-Inventory Items

Adding Items on the Non-Inventory Items Form

1   Open the Non-Inventory Items form.

2   Select Actions > New.

3   Specify a unique item name.

4   Specify the item type.

5   Specify other item properties as needed.

Note: You may enter a non-inventoried item number that is identical to an inventoried item number. However, only the inventoried item number will appear in drop-down menus. If the inventoried item is deleted, then the non-inventoried will then display in drop-down menus.

Adding Non-Inventory Items Dynamically

On any of the forms on which you can specify a non-inventory items (see About Non-Inventory Items):

1   When specifying an item, use a unique item ID. A message states that the item specified does not exist, and asks if you want to create it as a non-inventory item.

2   Click **Yes** to create a record for the new item.

3   Use the **Non-Inventory Items** form to further define the new item.

Deleting Non-Inventory Items

Delete non-inventory items on the Non-Inventory Items form.

1   Select the item(s) to delete.

2   Select **Actions > Delete**.

Note: You cannot delete a non-inventory item if it is currently associated with purchase orders, estimates, job materials, current materials, or RMAs.

Inventory Control Overview

A predominant feature of the **Material** module is the **Items** form. The **Items** form provides a list of all the items in stock. Each item records things you want to track, such as quantity and price.

Supplementary features of the **Material** module include:

- Item/Warehouse
- Item Stockroom Locations
- Vendor Contracts
- Current and Standard Routings
- Physical Inventory functions
- Management of Obsolete and Slow-Moving Inventory
- MRP and APS planning

When you add an item to the **Items** form, only general information about the item is entered. The **Item Warehouse** form maintains relation between item and warehouse along with warehouse specific information as cycle counting details, safety stock, etc. The **Stockroom Locations** file contains the amount of the item on hand along with the location at which it is stored. If items are kept in several locations, you can enter multiple records into the file.

On the **Items - Controls** tab, you can flag some inventory as obsolete or slow-moving. This functionality lets you improve material movement and inventory level management by preventing or discouraging all processes that would add such items to inventory.

The **Vendor Contracts** form allows you to enter information about an item which is vendor specific, such as the vendor's part number for this item. This record contains historical information, and you can enter multiple vendors per item. When you enter an item on a PO line item, the Vend Item field contains the vendor's item number as entered on the **Vendor Contracts** form.

The Current routing:

- Shows you how an item is built
- Consists of a list of operations and sub-materials.

The Current routing serves as a template for job routings. Instead of having to enter the job routing each time you want to build an item, just copy it from the current routing.

The Standard routing is useful for calculating the costs on the **Item Costs** form.

The Physical Inventory function provides the capability to take a physical count of every item on hand, input the counts into the system, and compare the book count with the actual count for each location of the item. After the actual counts are audited, edited, and approved, they may be posted to the Items record. This posting adjusts the inventory counts as well as the value for all items and locations that have a discrepancy between the book count and the actual count.

Inventory Control Home

The Inventory Control Home form provides a wide variety of information from other parts of the system in one form, all intended to be used by an inventory controller.

Inventory Features

The system's Inventory Control includes the following features:

- Maintain item details for stocked items, fixtures, tools
- Multiple stock locations per item
- Standard routings maintained for manufactured items
- Multiple vendors permitted for each Item
- ABC item reporting
- Usage analysis
- Obsolete and slow-moving inventory management
- Allocation analysis
- Average, LIFO, FIFO, Standard, or Specific costing methods
- Product code reporting and pricing
- Complete material transaction history reporting.

Inventory Control Steps

Setup Steps

To set up inventory control in the system, enter the following information:

- Global inventory parameters on the Inventory Parameters form.
- Product Codes to group similar types of items on the Product Codes form.
- Stock locations on the Locations form.
- Warehouses on the Warehouses form.
- Units of measure on the Units of Measure Codes form. See Create units of measure and unit of measure conversion records for more information.

Day-to-Day Management Steps

Follow these steps to manage your inventory:

- Create item records on the Items or Multi-Site Items form.
- Set up vendor and item cross-references on the **Vendor Contracts** form.
- Set up vendor and item pricing cross-references on the **Vendor Contract Pricing** form.
- Define the routing and bill of material for each item on the Current Operations and Current Materials forms.
- Create item lots on the Lots form.
- Add items to additional warehouses (other than the default warehouse) on the Item/Warehouse form.
- Specify the stockroom location of each item and the beginning on-hand quantity on the Item Stockroom Locations form.
- Enter stock/inventory transactions.
- Manage obsolete and slow-moving inventory.
- Monitor data on the Inventory Control Home form.

About Warehouses

In the context of Infor CloudSuite, a *warehouse* is a location within a site that can contain on-hand inventory. This overview includes information about warehouses and how they can be used in the system. Subtopics include:

- Warehouses and Locations
- Consignment Warehouses

- Warehouse Defaults
  - Default Warehouse Settings
  - About the "Current Warehouse"
  - Setting Warehouse Defaults Manually
- How MRP, APS, and MPS Processor Use Warehouses
- Moving Inventory Between Locations
- Counting Warehouse Inventory

Warehouses and Locations

Each site has at least one warehouse, designated as **MAIN**, which is created during system installation. In most cases, this also becomes the default, or primary, warehouse for the site, but you can change the default. For information about default warehouse settings, see Warehouse Defaults

Multiple Warehouses

Many companies have more than one location in which to store inventory, so the system allows you to add warehouse locations to the list of warehouses available for various transactions. To add warehouses, use the Warehouses form. You can also use this form to view and update information for all warehouses in the system.

Item Stockroom Locations

Once you have your warehouses established in the system, before you can show inventory in those warehouses, you must establish *item stockroom locations*. Each warehouse can contain multiple item stockroom locations where you store inventory for lot-tracking and other audit-trail purposes. Add these item stockroom locations using the Locations form.

When you add an item to the system using the Items form, the system automatically creates an item stockroom location for the item, using both the default warehouse (**Default Whse**) and default location (**Default Location**) as defined on the Inventory Parameters form.

Item/Warehouse Records

When you add an item to the system using the Items form, the system automatically creates an item/warehouse association (or record) for the item. For this, the system uses the default warehouse as defined in the **Default Whse** field on the Inventory Parameters form. As mentioned in the previous section, the system also automatically creates an item stockroom location.

If you want to stock the item at other warehouses, you must create an item/warehouse association for each warehouse location in which you want to store the item. To create these item/warehouse associations, use the Item/Warehouse form. You can then use the Item Stockroom Locations form to add quantities of the item to locations within the designated warehouse.

Externally Controlled Warehouses

If Controlled by External Warehouse is selected, operations at this warehouse are controlled by an external application, and many standard Infor CloudSuite operations are not performed. For a list of the forms and operations that are changed by this option, see Using an External Warehouse Application.

Consignment Warehouses

There are two ways to utilize a consignment warehouse:

- You can specify some of your warehouses as vendor consignment warehouses, where vendor material is stored until you decide to consume/purchase them.
- You can specify a customer's warehouse as a customer consignment warehouse, where you store some of your materials until the customer decided to consume/purchase them.

For more information regarding the setup of customer and vendor consignment warehouses, see Consignment Warehouse Setup.

Warehouse Defaults

On forms where you can select a warehouse (in other words, where the warehouse field is not just display-only), many of them use a default warehouse setting. In all cases, you can override this default setting by selecting a different warehouse.

The values for these default warehouse settings come from various places, depending on the form. The following table lists those forms with default warehouse settings for new records and where the default settings come from.

Default Warehouse Settings

NOTE: This table lists only those forms that have a warehouse selection list box with a default value for new records. Forms that do not use default values are not listed here.

Form	Default taken from
Combined Transfer Order Ship/Receive	(Display-only) The From Whse and To Whse fields on the Transfer Orders form.
Purchase Order Blanket Releases	The Warehouse field on the General tab of the Customer Orders form.
Customer Order Kit Builder	The Warehouse field on the General tab of the Customer Order Blanket Lines form.

Customer Order Lines	The Warehouse field on the General tab of the Customer Orders form.
Customer Order Shipping Error Processing	The Default Whse field on the General tab of the Inventory Parameters form.
Customer Orders	The Warehouse field on the Codes tab of the Customer Ship-Tos form. When the customer or customer ship-to changes, the system assigns the default warehouse for the customer order as follows: The default warehouse for the specified ship-to location. If blank and ship to is not 0, then the system uses the default warehouse for the ship-to 0 location of the specified customer. If blank, then the system uses the default user warehouse. If blank, then the system uses the default warehouse from the Inventory Parameters form. You can change the default setting for a customer, which changes this default, using the Set Default Warehouse form.
Cycle Count Generation	The Default Whse field on the General tab of the Inventory Parameters form.
Cycle Count Posting	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Cycle Count Purge	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Cycle Count Setup	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Cycle Count Sheet Report	The Default Whse field on the General tab of the Inventory Parameters form.
Cycle Count Variance Report	The Default Whse field on the General tab of the Inventory Parameters form.
Cycle Counting Error Processing	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".

Demand Summary - Scheduler	The warehouse associated with the selected demand record.
EDI Customer Order Blanket Releases	The Warehouse field on the General tab of the EDI Customer Orders form.
EDI Customer Order Lines	The Warehouse field on the General tab of the EDI Customer Orders form.
EDI Customer Orders	The Warehouse field on the Codes tab of the Customer Ship-Tos form. If that field is blank, then the default is taken from the Default Whse field on the General tab of the Inventory Parameters form.
Estimate Project Resources	The Default Whse field on the General tab of the Inventory Parameters form.
Freeze/Unfreeze Inventory	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Generate Goods Receiving Note Lines	(Display-only) The Warehouse field in the header of the Goods Receiving Notes form.
Goods Receiving Notes	The Warehouse field on the Ship From tab of the Vendors form.
Goods Receiving Notes Landed Costs	(Display-only) The Warehouse field in the header of the Goods Receiving Notes form.
Goods Receiving Notes Lines	(Display-only) The Warehouse field in the header of the Goods Receiving Notes form.
Inventory Pre-Adjustment Report	(Display only) The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse". To produce a report for a different warehouse using this form, use the Change Warehouse form.
Item Availability	(Display-only) The Warehouse field on the Item/Warehouse form.
Item Lot Locations	(Display-only) The warehouse selected from the grid view in the left pane. To view information and set controls for a different warehouse,

	select the warehouse you want from the grid view.
Item Stockroom Location Mass Creation	The Default Whse field on the General tab of the Inventory Parameters form.
Item Stockroom Locations	When adding items (using the Items form), the Default Whse field on the General tab of the Inventory Parameters form.
	When creating a new item stockroom location using this form, the value of whatever record was selected prior to initiating the action to create a new item stockroom location.
Job Material Kit Builder	The For Whse field on the Scheduling tab of the Job Orders form.
Job Material Transactions	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Job Orders	The Default Whse field on the General tab of the Inventory Parameters form.
Job Receipt	(Display-only) The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Just-In-Time Production Error Processing	The Default Whse field on the General tab of the Inventory Parameters form.
Just-In-Time Production Transactions	(Display-only) The Default Whse field on the General tab of the Inventory Parameters form.
Load Physical Inventory Records	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Material Planner Workbench Generation	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Miscellaneous Issue	(Display-only) The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Misc Issue/Receipt And Qty Adjust Error Processing	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Miscellaneous Receipt	(Display-only) The "current warehouse" as defined and recognized

	by the system. See About the "Current Warehouse".
Multi-Site Quantity Move	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Packing Slip	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Physical Inventory Approval	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Planning Detail Firm Transfer Order	The Default Whse field on the General tab of the Inventory Parameters form.
PO Receiving List	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Post Job Transactions	The Default Whse field on the General tab of the Inventory Parameters form.
Posted Transaction	(Display-only) The Default Whse field on the General tab of the Inventory Parameters form.
Production Schedule Items	The Default Whse field on the General tab of the Inventory Parameters form.
Project Resource Kit Builder	The Warehouse field on the General tab of the Project Resources form.
Project Resources	The Default Whse field on the General tab of the Inventory Parameters form.
Purchase Order Blanket Releases	The Warehouse field on the General tab of the Purchase Orders form.
Purchase Order Lines	The Warehouse field on the General tab of the Purchase Orders form.
Purchase Order Receiving	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".

Purchase Order Requisition Lines	The Warehouse field on the Purchase Orders form.
Purchase Order Requisitions	The Default Whse field on the General tab of the Inventory Parameters form.
Purchase Orders	The Warehouse field on the Ship From tab of the Vendors form. If that field is blank, then the default is taken from the Default Whse field on the General tab of the Inventory Parameters form. You can change the default setting for a vendor, which changes this default, using the Set Default Warehouse form.
Quantity Adjustment	(Display-only) The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Quantity Move	(Display-only) The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".
Reservations for Item	The Default Whse field on the General tab of the Inventory Parameters form.
Reservations for Order	(Display-only) The Warehouse field on the Codes tab of the Customer Ship-Tos form. If that field is blank, then the value is taken from the Default Whse field on the General tab of the Inventory Parameters form.
RMA Return Transaction	(Display-only) The Warehouse field on the General tab of the RMAs form.
RMAs	The Warehouse field on the Codes tab of the Customer Ship-Tos form. If that field is blank, then the default is taken from the Default Whse field on the General tab of the Inventory Parameters form.
Set Tag Sheet Controls	(Display-only) The warehouse selected from the grid view in the left pane. To view information and set controls for a different warehouse, select the warehouse you want from the grid view.
Time Phased Inventory Status	The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".

Transfer Order Kit Builder	The From Whse field on the header of the Transfer Order Line Items form.
Transfer Order Line Items	(Display-only) The From Whse and To Whse fields on the Transfer Orders form.
Transfer Order Receive	(Display-only) The From Whse and To Whse fields on the Transfer Orders form.
Transfer Order Receive Error Processing	(Display-only) The From Whse and To Whse fields on the Transfer Orders form.
Transfer Order Ship	(Display-only) The From Whse and To Whse fields on the Transfer Orders form.
Transfer Order Ship Error Processing	(Display-only) The From Whse and To Whse fields on the Transfer Orders form.
Unposted Job Transactions	The For Whse field on the Scheduling tab of the Job Orders form.
Warehouses	(Display-only) The warehouse selected from the grid view in the left pane. To view information and set controls for a different warehouse, select the warehouse you want from the grid view. NOTE: Because one purpose of this form is to allow you to add new warehouses, when adding a new warehouse, this field by default is blank.
Work Center Material Transactions	(Display-only) The "current warehouse" as defined and recognized by the system. See About the "Current Warehouse".

About the "Current Warehouse"

Many forms take as their default value the warehouse that the system recognizes as the "current warehouse," which can change on a per-user, per-session basis. When designating the "current warehouse," the system uses the following rules:

- When you log in, the system designates the warehouse from the your profile as the "current warehouse" for that session.

  This setting is defined in the **Whse** field on the **Additional Info** tab of the Users form.

- If that field is blank, the system uses the **Default Whse** field on the **General** tab of the Inventory Parameters form.
- At any point after logging in, you can change the "current warehouse" setting for that session using the Change Warehouse form.

  NOTE: This "current warehouse" setting is valid only on a user-session basis. That is, the "current warehouse" setting can be different for each user logged in to the system. Also, this setting is only in effect as long as you are logged in. After you log out, the setting reverts to your default user setting, if any, when you log in again.

Setting Warehouse Defaults Manually

The system offers several ways to manually change warehouse default settings. You can:

- Change the system default warehouse using the **Default Whse** field on the **General** tab of the Inventory Parameters form.
- Change a user's default "current warehouse" setting using the **Whse** field on the **Additional Info** tab of the Users form. See About the "Current Warehouse".
- As a user, change the "current warehouse" setting for your current session using the Change Warehouse form. See About the "Current Warehouse".
- Change the default warehouse for a range of customers using the Set Default Warehouse form.
- Change the default warehouse for a range of vendors using the the Set Default Warehouse form.
- Change the default warehouse for a range of users using the Set Default Warehouse form.

How MRP, APS, and MPS Processor Use Warehouses

The MRP, APS, and MPS Processor planning functions view on-hand inventory as the total on-hand quantity (that is, **On Hand - Qty Reserved** for customer orders) at all nettable stockroom locations across all warehouses at the site.

EXAMPLE: Suppose you have a customer order for 150 of an item. The item is stored at three warehouses, A, B, and C. Warehouse A contains 50 on-hand, warehouse B contains 75 on-hand, and warehouse C contains 40 on-hand. When you run MRP or APS Planning or the MPS Processor, the system allocates on-hand from all three warehouses to satisfy the demand, and no planned orders are needed. This planning behavior occurs regardless of any specific warehouse specified on the customer order.

Dedicated Remote Warehouses

Warehouses with dedicated inventory are useful for serving demands tied to that warehouse and which do not affect planning for the remainder of the site. In the example above, suppose you wanted to "protect" the inventory at warehouse C so it could be used only for specific customer orders. To do this, select the **Dedicated Inventory** check box on the Warehouses form for that warehouse.

When you run the MRP or APS Planning or MPS Processor, the system ignores the inventory in the dedicated-inventory warehouse. Likewise, these planning functions ignore all demands and supplies that specify a dedicated-inventory warehouse.

NOTES:

- You cannot select the **Dedicated Inventory** option for a warehouse selected as the default warehouse (**Default Whse**) on the **Inventory Parameters** form.

- You cannot perform the **Get ATP** or **Get CTP** function on a line item (for example, on the **Customer Order Lines** form) that is associated with a dedicated-inventory warehouse.

- The **Planning Detail** and **Planning Summary** forms do not display any inventory transactions related to dedicated-inventory warehouses.

- The exception message "Initial On-Hand Quantity Negative" (which appears on the **Planning Detail** form and on the **Exceptions Report**) does not consider inventory at dedicated-inventory warehouses.

- The planning functions ignore demands set to ship from dedicated-inventory warehouses and supplies set to supply dedicated-inventory warehouses.

Dedicated Inventory and Planning of Transfer Orders

- Outgoing transfer orders are not planned as demands at the current, local site if the warehouse specified in the **From Whse** field is a dedicated-inventory warehouse. However, that transfer order is planned as a supply if it is sent to a warehouse at the same site that is a non-dedicated inventory warehouse (that is, if the **To Whse** field contains a warehouse in which the **Dedicated Inventory** check box is not selected).

- Incoming transfer orders are not planned as supplies at the current, local site if the warehouse specified in the **To Whse** field is a dedicated-inventory warehouse. However, that transfer order is planned as a demand if it is received from a warehouse at the same site that is a non-dedicated inventory warehouse (that is, if the **From Whse** field contains a warehouse in which the **Dedicated Inventory** check box is not selected).

Distribution Warehouses

Distribution warehouses are dedicated-inventory warehouses that are designated to plan intra-site transfer using the transit time between the default warehouse and a distribution warehouse. For these transfers, the original demand is ignored, but the pre-planning process generates planned transfer orders based upon the demand at the distribution warehouse. New planned intra-site transfers represent demand for the planning engines.

Sourcing Percentages of Planned Orders

You can set rules that automatically split planned transfer orders for a certain item or product code between multiple sites and warehouses, specifying what percentage of the order comes from which site/warehouse. For more information, see Creating Source Rules for Planned Orders.

Moving Inventory Between Locations

Use transfer orders to move inventory from one warehouse to another (within the same site or across sites). See Transfer Orders Overview and Multi-Site Overview for more information about transfer orders.

A hypothetical shipping and receiving scenario, in which both warehouses are within the same site, is shown below:

- Warehouse A transfers to Warehouse B.
- Warehouse A ships to a Transit Location, which is maintained at Warehouse B.
- When Warehouse B receives the item, it is moved from the Transit Location to a Stock Location within Warehouse B.

The following diagram shows this process.
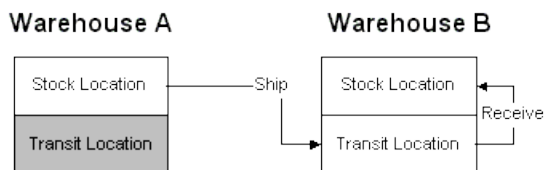
Moving Quantities Between Locations

To move inventory between:

- Different sites, warehouses within the same site, or locations within a single warehouse, you can use the Multi-Site Quantity Move utility.
- Two warehouses within the same site, you can use the Warehouse to Warehouse Bulk Transfer utility.
- Different locations within a single warehouse, you can use the Quantity Move utility.

Transferring Lot-Tracked Items

When you transfer a lot-tracked item from a warehouse at one site to a warehouse at another site, there are issues to consider regarding whether the lot number exists at each site and in which location it will be created. See About Multi-Site Transfer Order Lot Tracking for several examples that illustrate this process.

Counting Warehouse Inventory

Keeping count of inventory is done at the warehouse level. There are two primary ways to take a count of the existing inventory at each warehouse:

- **Performing a cycle count** - Cycle counting involves counting your inventory quantities at each warehouse and stock location on a scheduled, cyclical basis. You can define cycle-count triggering options at each warehouse to instruct the system to create a cycle count record each time a particular inventory event occurs at that warehouse. For more information, see About Cycle Counting.

- **Performing a physical inventory** -" Doing a physical inventory involves someone doing an actual physical count of the inventory in a warehouse. This process involves printing out tags and/or sheets for personnel to take an actual count of the inventory in stock and then manually entering that information into the physical inventory system. For more information, see About Physical Inventory.

Cycle Counting at Warehouses

Cycle counting involves counting your inventory quantities at each warehouse and stock location. At each warehouse, you can define cycle-count triggering options that instruct the system to create a cycle count record each time a particular inventory event occurs at that warehouse.

EXAMPLE: The system can create a count record each time a receipt or issue transaction is processed against an item or each time the on-hand level falls to zero. For more information, see the help topic for the **Cycle Type** field (which appears on the **Warehouses** form).

For more information about the overall cycle-counting process, see About Cycle Counting.

About Item Stockroom Locations

When you move or adjust a quantity or add a new location, a material transaction is created to provide an audit trail. You may print this audit trail with the Material Transaction Report. Material transactions are also created when you:

- issue an item to, or withdraw an item from, a job
- finish a job
- start a job
- move an item to the next operation in a job
- ship or return customer orders
- receive or return purchase orders

Accounting ConsiderationsWhen you create a new stockroom location, the system creates records in the Inventory Control Ledger Distribution Journal in the General Ledger. For either Actual or Standard costing (specified in the Inventory Parameters), the transaction is posted only if a quantity is entered for the location at the same time it is added. The amount used is the quantity entered multiplied by the unit cost. For Actual costing, the unit cost used depends on the cost flow method specified for the item. For Standard costing, the standard unit cost is used.

The Update function creates records in the Inventory Control Ledger Distribution Journal in the General Ledger. For either Actual or Standard costing (specified in the Inventory Parameters), the transaction is created only if the inventory account tied to the location is changed. When using the Specific cost flow method, a transaction is also created when the unit cost tied to a location is changed.

Warehouses Controlled by External Applications

For a warehouse where Controlled by External Warehouse is selected on the Warehouses form:

- Only one location with a location type of Stock is allowed for the warehouse.
- All inventory is held under one location.
- The location type cannot be Non-Nettable.

Auto-Delete of Item Stockroom Locations

The Permanent check box identifies a location as permanent or temporary. If the location is temporary, the item stockroom location is automatically deleted when the On Hand quantity becomes zero through any of the following transactions:

- Customer Order Shipping
- Purchase Order Receiving
- Warehouse Transfers: Ship, Receipt, or Combined
- Quantity Move
- Quantity Adjustment
- Miscellaneous Issue
- Miscellaneous Receipt
- Job Receipt
- Job Material Issues
- Job Labor Transactions

Using an External Warehouse Application

Infor CloudSuite Business can be integrated with external warehouse applications such as Infor SCE Warehouse Management and Transportation Management. For more information about that integration, see the Infor CloudSuite Business Integration Guide for Infor SCE Warehouse Management and Transportation Management.

As part of this integration, the Controlled by External Warehouse field must be selected on the Warehouses form for warehouse operations that are controlled by an external application.

When the Controlled by External Warehouse field is selected, the warehouse inventory cannot be changed as a result of Infor CloudSuite processing. Standard Infor CloudSuite processing is prevented or changed on certain forms. See the list of forms in the online help.

Note: If the form prevents processing, the external controlled warehouse is not listed in any drop-down menus and is not a valid entry in fields.

Creating a New Item

For each item that is processed through your system, you can enter a record that will help you track and control all subsequent transactions that include the item.

1   Follow the Setup Steps in Inventory Control Steps.

2   Open the **Items** form, or the **Multi-Site Items** form if you are working in a master site.

3   Turn off filter-in-place mode.

4   Select **Actions > New**.

5   Enter this information in the header:

    a   In the **Item** field, enter a unique number, string of characters, or combination of characters and numbers to represent the vendor. If you do not enter a value, the system assigns the next unique numerical value automatically. If you set up an item prefix in the **Inventory Parameters** form, the system prefixes the item number with that prefix. The combined prefix and number cannot be longer than 10 characters.

    b   In the field below the item number, enter the item description, which will appear on reports and transactions.

    c   If you are working in the **Multi-Site Items** form, specify the **Site** at which this item will be added.

6   Specify other required and optional information, as described in the field help on the form.

7   Save the record.

8   Follow the "Day to Day Management" steps in Inventory Control Steps to set up related information about the item.

Maintaining Multi-Site Items from a Master Site

Use the Multi-Site Items form to maintain items for multiple sites on an intranet from the master site of the intranet. Keep in mind that each site can still control its local item records.

Adding Items

To add item for any site on the master site's intranet, follow the steps in Creating a New Item.

Copying Items to Other Sites

To copy an item to multiple sites in the same intranet from this form:

1   Select an existing item. The item must be defined as completely as possible before you copy it, and the item record must be saved at one of the shared sites in the master site's intranet.

2   Select **Actions > Multi-Site Copy**. The **Multi-Site Selection** form is displayed.

3   Select one or more groups from the list of site groups in the left pane. The left pane only lists site groups where all of these are true:

- The site group includes the master site.
- The site group includes the source site from which the selected record will be copied.
- All sites in the group are on the master site's intranet

4   A list of the sites in those groups is displayed in the right pane. Select one or more sites to which you want to copy the item.

5   Click **OK** to return to the **Multi-Site Items** form.

6   Save your changes to add the duplicate item records to the other sites.

Note: This procedure does not copy the item's BOM. To copy an item's single-level current routing and BOM to the same item at other sites, see Copying a Multi-Site Item Bill of Materials.

Information Filtered by Site

You specify the site when you add an item. The following fields are filtered by the selected site. For example, when you add an item and specify Site B, you can only select product codes that are valid at Site B.

- Alternate Item
- U/M
- Product Code
- Unit Weight U/M
- Family Code
- Production Type
- Warehouse
- Setup Group
- Reason
- Backflush Location
- Preferred Co-product Mix
- Commodity
- Origin

The Buyer field is filtered by the master site. That is, the information in the drop-down list is from the master site, not the site you specified.

Maintenance Tasks Not Available from this Form

For most tasks, you can use the **Multi-Site Items** form in place of the **Items** form. However, these tasks can be performed only in the **Items** form at the specific site:

- Delete an item
- Add notes to the record
- Specify tax information
- Define item categories, attributes, and related items
- Provide a picture of the item
- Display the BOM view
- Define scheduler batches for the item, and set a few other APS-related options
- Use Actions menu "List" options

Adding a Multi-Site (Global) Item (No Master Site)

If your multi-site system includes a master site, go to the topic Maintaining Items from a Master Site. Otherwise, use the processes described here.

You may want an administrator to control adding, updating, and deleting items across the system. Keep in mind that each site can control its local Items records, and these records are independent of other sites.

Adding Global Items

NOTE: In the following description, "shared sites" means the Centralized Order Entry category and/or the Inventory/Transfers category are being replicated between the sites.

When an item is added in one site, it does not automatically populate in other shared sites. To add the existing item into another shared site:

1   On the Items form, select **Actions > New**.

2   Enter the item number or select it from the drop-down list. (The item number already exists at the other site and was replicated to this shared site).

3   The system enters the default values from the Global Items form into these fields: Item, Description, and U/M.

4   You must then fill in the rest of the information manually at the shared site.

The Global Items form also contains a default Shipping Site, which is used to determine how the Customer Order Line ship site defaults when entering a centralized order for the item.

Typically shared sites have identical Global Items default values when all sites are within the same country. If sites are in different countries, the Description and U/M fields can be updated as required.

Copying Item Records

Another way to duplicate item records in multiple sites is to create the records in one site, export them to a spreadsheet, and import the spreadsheet into the Items form at the new site. (Make sure the form's grid columns are arranged in the same order at both sites.)

If your sites are accessible through a single computer, you also may be able to use the right-click Copy feature to copy the item rows from the Items form on one site and then use **Edit>Paste Rows Append** to add them at the other site.

Coordinating U/Ms at Different Sites

Item units of measure are handled differently for customer order entry and transfer orders:

- Transfer Orders - Items on transfer orders must have identical units of measure at all sites.
- Order Entry - It is not necessary to have the same U/M defined at different sites, as long as the shipping site has defined a U/M conversion between the item's base U/M and the U/M used in the order line.

If an item could be both sold on a customer order and transferred between sites, then the item must have identical units of measure at each site.

Routing/BOM Information Used at Different Sites

If the product is made differently or has different manufacturing standards at each site, the routing and BOM can be added manually at each site. To copy an item's single-level current routing and BOM to the same item at other sites, see Copying a Multi-Site Item Bill of Materials.

Copying a Multi-Site Item Bill of Materials

Use the **Multi-Site Bill of Materials Builder** to copy an item's bill of materials (BOM) from this site to all selected sites.

To copy an item's BOM:

1   Specify the item to be copied. The description, type, and source information for the selected item is displayed.

2   Explore the current BOM tree for the selected item, which is displayed. To explore the BOM, you can right-click and launch the appropriate form from the tree for items and operations. However, the tree is not recursive, so you cannot drill down to jobs.

   Note: Verify that the records listed in **Validations**, below, exist in the target site and match the values defined in the BOM.

3   Select **Create Non-Inventory Items** to create in the target site any non-inventory items that are included in the BOM. (Inventory items must already be defined in the target site before you

perform the copy.) For more information, see About Non-Inventory Items and Managing Non-Inventory Items.

4   Select the target sites in the grid to which you want to copy the BOM. To select or deselect all listed sites, use the buttons.

5   Click **Copy BOM**. A confirmation message box is displayed if the copy was successful. If the copy failed at any of the sites, a message that indicates the error is displayed next to the site in the grid, and the copy is rolled back at that site. The process then continues to the next site. If the copy to a site failed because of a validation error, see **Validations**, below, for more information.

Rules for Using the Builder

- The item must already exist in the sites to which you plan to copy the item's BOM. To copy the item to the other sites, see Maintaining Multi-Site Items from a Master Site or Adding a Multi-Site (Global) Item (No Master Site).

- If a BOM for the item already exists in the selected site, then the existing BOM is deleted before the new BOM is copied to the site.

- Standard BOMs cannot be copied.

- The Builder copies a single level at a time. To create a complete indented BOM in the other sites, you must copy each of the manufactured components (individual levels of the BOM) separately, as well as all phantom items separately. Copy all of this information to each of the sites where you are copying the item's BOM.

- If the item whose BOM is to be copied is revision-tracked in the target site, then a message is returned and the BOM is not copied.

Replication Notes

A replication rule must exist between the source and target sites that specifies the Multi-Site BOM Builder replication category.

We recommend that this process only be used with transactional replication. If a validation fails during transactional replication, a message is displayed and the whole process is rolled back. The Builder also works with non-transactional replication; however, if a validation fails in the middle of the process during non-transactional replication, it could leave the target site in an error state. For example, the target site's current BOM was deleted but only part of the new BOM was created.

Validations

Certain fields are validated to ensure that they already exist in the target site before the BOM is copied. If they do not exist, a message is displayed and the BOM copy could fail and be rolled back. The existence of these records is validated in the target site:

When Current Operations are copied:

- Parent Item
- Work Center
- Setup Matrix
- Work Center Setup Time Rule
- Scheduler Rule
- Batch Definition
- When Current Materials are copied:
  - Parent Item
  - Component's Operation
  - Component Item
  - U/M Conversion to this U/M
  - Component Manufacturer ID
  - Component Manufacturer Item
  - Component Feature
- When Resource Groups are copied:
  - Parent Item
  - Resource Group
- When Reference Designators are copied:
  - Component Item
  - Component Operation number
- When Product Configuration Features are copied:
  - Component Item
  - Component Operation number

Note: It is your responsibility to manually verify that the values match in both sites before the copy is performed. For example, if item BS-100 is defined as a bike seat in the source site and item BS-100 is defined as a tire in the target site, the Builder will copy the routing and materials to build a bike seat to the tire item in the target site.

Creating an Item/Warehouse Record

To maintain an item in inventory at more than one warehouse, you must create an Item/Warehouse record for each warehouse where an item may be stored.

When you create an inventory item, an item/warehouse record is automatically created using the default warehouse as designated on the Inventory Parameters form. You need to create additional item/warehouse records only if you plan to store the item in other warehouses.

Before you can create such additional item/warehouse records, you must first create one or more additional warehouses using the Warehouses form.

Manually Creating an Item/Warehouse Record

To create an item/warehouse record:

1   Open the **Item/Warehouse** form.

2   On the toolbar, click the Filter-in-Place button.

3   In the **Item** field, select the item for which to create a new warehouse location.

4   In the **Warehouse** field, select the warehouse in which to store the item.

   NOTE: Remember that, before you can select additional warehouses, you must first create them using the Warehouses form.

5   Save the record.

Creating Item Stockroom Locations When Entering Transactions

You can use the Item Stockroom Locations form to create a record of every location where an item is kept. However, you can also create stockroom locations for an item when you are entering transactions. For example, you may be in the middle of a receiving transaction and decide you want to receive an item to a location that does not currently exist on the system. The system supports you in adding locations during the following transactions:

- CO Shipping
- PO Receiving
- Warehouse Transfers: Ship, Receipt, or Combined
- Item Quantity Move
- Miscellaneous Receipt
- Job Receipt
- Job Material Issues
- Job Labor Transactions

NOTE: The same logic also applies to data collection transactions. You can also create locations when entering transactions from the list above.

The system does not allow you to add locations for the following transactions at the time of entry:

- Item Quantity Adjust
- Miscellaneous Issue
- Shipping List
- Receiving List
- Warehouse Transfer Shipping List
- Job Pick List
- Cycle Counting

Logic Used by the System When Creating Item Stockroom Locations Automatically

With Lot Tracking

If you enter a location and lot that does not exist on the **Item Stockroom Locations** form but for which the stock location code is valid, you are prompted to confirm the new stockroom location/item combination. The record is then created using the defaults from the item's product code or the G/L account numbers. The Permanent check box is cleared. The settings for the Non-nettable and Type fields default from the stock location code.

If the item stockroom location exists for the location but the location/lot does not, then the defaults used for creating the new location are taken from the first item stockroom location record. These include the G/L account numbers, Permanent flag, Non-nettable flag, and Type. You are asked to confirm the new item stockroom location.

Without Lot Tracking

You can create item stockroom locations when entering transactions if you are not using lot tracking. You can key this new location and it will be created using the defaults from the product code of the item for the G/L account numbers. The Permanent check box is cleared. The settings for the Non-nettable and Type fields default from the stock location code. You are asked to confirm the new item stockroom location.

Containers Overview

The containers functionality allows inventory to be grouped into containers within a warehouse and stockroom location. The container is assigned a unique container ID. Incoming inventory can be added into a container. Internal inventory movement and outgoing inventory can be transacted at the container level. These transactions allow you to provide a container ID, and the system will perform all the single-level inventory transactions transparently, allowing inventory movement to be performed with a single transaction.

Note: In order to receive inventory into a container, the receive quantity must be greater than or equal to 0, and the on hand balance must be greater than or equal to 0.

Transaction Types

- **Add Inventory** - Inventory is added to a container. This usually occurs though a PO receipt or job receipt transaction. This type of container transacting is at the item level in that line item quantities are added to the container one at a time.
- **Bulk** - Container inventory is moved or removed. This usually occurs through a job material issue or order shipping transaction. This type of container transacting is at the bulk level in that the entire container contents are taken out of the stockroom location and the container goes away.

Add Inventory

You can add inventory to a container through the following transactions:

- **Goods Receiving Notes** - GRN receipts can be received into a container through the **Purchase Order Receiving** form.

- **Job Receipt** - Job Receipts can receive inventory into the stockroom or into a container within the stockroom. Inventory may not be returned from a container back to a job. To return from inventory back to the job, the system validates there are available single units to withdraw by subtracting the contained and reserved quantities from the quantity on hand. If an item is defined to track tax free material, receiving into a container is not allowed.

- **Just-In-Time Production Transactions -** Inventory can be entered into the stockroom or into a container within the stockroom using the Just-In-Time Production Transactions form. A JIT Production transaction cannot be used to return inventory from a container. To return from the stockroom, the system validates there are available single units to return by subtracting the contained and reserved quantities from the quantity on hand. If an item is defined to track tax free material, entering into a container from a Production Schedule is not allowed.

- **Miscellaneous Receipt** - Inventory can be received into the stockroom or into a container within the stockroom. The Miscellaneous Receipt transaction does not allow a negative quantity. If an item is defined to track tax free material, receiving into a container is not allowed.

- **Production Schedule Complete Transactions** - Production Schedule inventory can be completed from the production schedule into the stockroom or into a container within the stockroom. Inventory cannot be returned from a container back to a production schedule. To return from the stockroom back to the production schedule, the system validates there are available single units to withdraw by subtracting the contained and reserved quantities from the quantity on hand. If an item is defined to track tax free material, receiving into a container is not allowed.

- **Purchase Order Receiving** - Purchase Order inventory can be received into the stockroom or received into a container within the stockroom. PO inventory can also be returned from the stockroom, but not from a container. To return from inventory, the system validates there are available single units to return by subtracting the contained and reserved quantities from the quantity on hand. If the PO Line is for a non-inventory item, an item defined to track tax free material or has a cross-reference value, receiving into a container is not allowed.

- **RMA Return Transaction** - RMA Lines inventory can be returned into the stockroom or returned into a container within the stockroom. RMA Lines can be returned from the stockroom but not from a container. To return from the stockroom, the system validates there are available single units to return by subtracting the contained and reserved quantities from the quantity on hand. If an item is defined to track tax free material, returning into a container is not allowed. If the transaction is for a negative quantity, there is validation to determine whether there are available single units to remove from inventory.

- **Unposted Job Transactions** - If the Job Stock Transaction check box is selected on the **Shop Floor Control Parameters** form, inventory can be moved from a Job Operation into the stockroom or into a container within the stockroom. Inventory cannot be withdrawn from a container back to a job. To withdraw inventory from the stockroom, the system validated there are available single units to withdraw by subtracting the contained and reserved quantities from the quantity on hand. If an item is defined to track tax free material, moving into a container is not allowed.

Bulk (Inventory Removed)

You can remove inventory from a container through the following transactions:

- Batched Productions

- Job Material Transactions - A Container can be issued to a Job Operation in its entirety using the Job Material Transactions form. The transaction can be performed at the Job or the Job Operation level. You can specify a container number when filtering on the operation. To perform the transaction at the job level, leave the Operation field blank. The container's Usage Reference (set on the Containers form) must be either Inventory or cross-referenced to the Job/Operation. All rows in both the materials grid and serial numbers grid are automatically selected even if there are discrepancies between the container contents and the operation materials. It is required that all item, lot are serial numbers are selected to issue because the container must be issued in its entirety. Materials must either be all selected or all cleared; they cannot be selected or cleared on a line-by-line basis. When the Process button is selected, items not on the operation are added to the operation. All item, lot and serial quantities within the container are issued to the job when the Process button is selected. If the transaction is at the item level, the system validates to determine whether there are available single units to issue.

- Miscellaneous Issue - Containers can be issued from inventory using the Miscellaneous Issue form. All container contents must be successfully issued, or the entire transaction is canceled. Upon specifying the container number, the container's Usage Reference (set on the Containers form) must be Inventory. If the transaction is at the item level, the system validates to determine whether there are available single units to issue.

- Order Shipping - A Container can be shipped against a customer order in its entirety using the **Order Shipping** form. Specify a container number when filtering on the Order Number. The container's Usage Reference (set on the Containers form) must be Inventory or cross-referenced to the Order. The container contents are compared to the order lines. If there are any items in the container contents that are not on the order lines, an error message appears that there are differences prompting whether to redirect you to the Container form. This allows you to revert the container contents back to single units. If you select YES, the transaction must be performed at the item level. If you select NO when prompted to go to the Containers form, the transaction does not continue. At this point you have the option to add the items to the order or remove the items from the container. Quantity differences between the container and the order line are allowed, but it is highly recommended that the container contents are reviewed prior to the shipping transaction. No Ship Early or Ship Partial messages will be displayed (these are informational and do not restrict the shipping transaction). If the container contents match the order lines, the order line grid populates with the item and lot quantities within the container. The Serial Numbers grid populates with the serial numbers within the container. All rows in both the line grid and serial numbers grid are automatically selected. It is required that all item, lot are serial numbers are selected to issue because the container must be issued in its entirety. Lines may either be all selected or all cleared; they cannot be selected or cleared on a line by line basis. All item, lot and serial quantities within the container are shipped when the Process button is selected. If the transaction is at the item level, the system validates to determine whether there are available single units to issue.

- Production Schedule Material Issue - Production Schedules issue materials through backflushing or materials can be manually issued through a Work Center Material transaction. If Production Schedule material is issued through backflushing, there must be sufficient single units in the location to meet the backflush quantity. Single units are calculated by subtracting the quantity

reserved and quantity contained from the quantity on hand. If material is issued manually to Production Schedule items through Work Center Material transactions, container processing is supported. If the transaction is at the item level, the system validates to determine whether there are available single units to issue.

- Project Resource Material Issue - Containers can be issued to a Project Resource Task using the **Project Resource Transactions** form. You can issue the container at the project level or the project task level. To issue the container at the project level, leave the Task field blank. Upon specifying the project or project task, the container's Usage Reference (set on the Containers form) must be Inventory or cross-referenced to the Project or Task. The container contents are compared to the project task resources. If the transaction is at the project level, the task is automatically determined based on which container items match its resources. If there are items in the container that are not defined as task resources or the quantity required differs from the container quantity, a message appears that the container contents do match the project resources. When the Process button is selected, items not on the task are added to the task. A message appears when adding an item to the project task, but is informational only. All container contents must be successfully issued, or the entire transaction is canceled. If the transaction is at the item level, the system validates to determine whether there are available single units to issue.

- Quantity Move - Containers can be moved from one location to another location within the same warehouse using the Quantity Move form. This transaction encompasses a single-site quantity move only. All container contents must be successfully moved to the new location, or the entire transaction is canceled. If the transaction is at the item level, the system validates to determine whether there are available single units to move.

- Warehouse to Warehouse Bulk Transfer - Containers can be transferred to another warehouse and location using the Warehouse to Warehouse Bulk Transfer form. Every container within the From Warehouse and Location is removed and added to the To Warehouse and Location.

- Work Center Material Transactions - A container can be issued to a Work Center in its entirety using the Work Center Material Transactions form. On the Container Contents tab you can view the container contents prior to issuing it to the Work Center. Upon specifying the container number, the container's Usage Reference (set on the Containers form) must be Inventory. If the transaction is at the item level, the system validates whether there are available single units to issue.

Other Considerations

- **Cycle Count** - When performing Cycle Counting, you are only required to transact at the item location level, but you cannot enter a value that is less than the quantity that is within containers at that location/lot. For example, an item location has 150 of an item; 100 are in Container C1, 50 are loose. In this case if you enter a quantity of 151, during posting nothing changes in the Container quantity, and the overall Item Location quantity is adjusted. In this scenario, it would be as though there are now 51 loose. However, if you attempt to enter a value that is less that the contained quantity, an error message appears. This validation is performed by the Cycle Count posting process, and the transaction will not post until the contained quantity is reconciled.

- **Generate Order Pick List** - To pick inventory in containers, the Post Material Issues check box on the **Generate Order Pick List** form must be cleared.

- **Job Pick List** - To pick inventory in containers, the Post Material Issues check box on the **Job Pick List** form must be cleared.
- **Physical Inventory** - When performing Physical Inventory, you are only required to transact at the item location level, but you cannot enter a value that is less than the quantity that is within containers at that location/lot.
- **Quantity Adjustment** - You must use the Containers form to adjust container quantities.

Create a Container

Use the **Containers** form to create a container.

Utility Forms

Compare Container To Customer Order Utility

Compare Container To Project Resource Utility

Report Form

Container Contents Report

Query Form

Item Containers Query

Defining and Processing a Kit

Defining a Kit

To set up a new kit item, perform these steps:

1 On the Items form or Multi-Site Items form, add and save a new item that will be the kit item. (You cannot select the **Kit** check box yet.)

2 Add and save an item record for each component of the kit. Some components may already be defined as items.

3 Use the **Engineering Workbench** form to define a current routing and bill of material for the kit item. If there are no labor or machine costs associated with the kit, you may define a "dummy" work center that has no costs.

4 Roll the current routing/BOM to **Standard**.

5 On the **Items** form, select the **Kit** check box for the item designated as the kit item. If you want customer order paperwork to include a list of the kit components, also select the **Print Kit Components on Customer Paperwork** check box.

NOTES:

• Pricing is done at the kit level, not at the component level.

• Materials issued during the processing of a kit will be marked as backflushed. Although some processes can now backflush lot-tracked and serial-tracked items, Kit Builder still does not.

Processing a Request for a Kit

After the kit item is defined, the kit can be specified on a customer order, job order, project resource, or transfer order.

Follow these steps to process a request for a kit:

1 Use one of the following forms to process a single transaction that performs the material issues for kit components, using just-in-time transaction processing logic. This is done using the kit item's standard bill of materials.

• Customer Order Kit Builder

• Job Material Kit Builder

• Transfer Order Kit Builder

• Project Resource Kit Builder

On any of these forms, follow these general steps:

1.

1   Select filter criteria (range of kit items to process, planner code, and/or a due date range) and click the **Filter** button.

    a   Each line item that matches the filter criteria is displayed in the grid.

- For a customer order line to be listed, the following conditions must be met:

  Line Item Status is Ordered

  Quantity Ordered > Quantity Shipped

  Ref Type = Job

  Ref Number is blank.

  The default location is selected and, if the item is lot-tracked, a default lot is also displayed.

- For a transfer order line to be listed, the following conditions must be met:

  Quantity Ordered > Quantity Shipped

  Line Status = Ordered

  Ref Type = Job

  Ref Number is blank

- For a job material or project resource to be listed, the following conditions must be met:

  Quantity Required > Quantity Issued

  Ref Type = Job

  Ref Number is blank.

    b   Select the records to process and specify a quantity and location. If the item is lot-tracked or serial-tracked, you can specify lot and serial numbers.

    c   Click **Process** to generate inventory transactions for the kits. A job transaction record for a just-in-time transaction is created for each selected line, and the standard routing and bill of materials are used to post the kit components.

       For Customer Order Kits, if the kit item is marked as **Reservable** on the **Items** form, the system also creates a reservation for the line item and the kit that was just created.

2   Click the **Print Pick List** button to display the appropriate form (below) where you can generate a pick list for the kit. This prints the standard routing/BOM for the required quantity.

- Customer Order Kit Pick List
- Job Material Kit Pick List
- Transfer Order Kit Pick List
- Project Resource Kit Pick List

3   Print customer paperwork for orders (**Order Verification Report**, **Packing Slip**, and/or **Order Invoicing/Credit Memo**). The paperwork lists the kit and, optionally, its components.

About Obsolete and Slow-Moving Inventory

By developing business processes to identify some items as Obsolete or Slow Moving, you can:

- Obtain greater control over your inventory
- Gain better visibility into your inventory

The system supports this process by providing:

- A Material Status field on the Items - Controls tab where you can flag items as Active, Obsolete, or Slow Moving. (You can also use the Change Item Status Utility to flag a range of items.)
- A Reason Code field that allows you to track why items are being flagged as obsolete or slow-moving.
- The name of the user who last changed the Material Status field.
- Date of the last Material Status change.

Controls on Obsolete and Slow-Moving Inventory

Once items have been flagged as **obsolete**, The system regulates their use by:

- Preventing you from manufacturing or purchasing the items
- Warning you before you accept an obsolete item as a return
- Preventing you from selling or transfering an obsolete item.

Once items have been flagged as **slow moving**, The system regulates their use by:

- Warning you before you make or buy the item
- Warning you before you accept a slow-moving item as a return

Several system functions that build inventory prevent you from adding an obsolete item.

Dimensional Inventory Overview

Infor CloudSuite can track attributes for items, lots, and item pieces. Attributes can include dimensions, which you use to define a type of sub-item called a *piece*. You can keep track of item pieces as the item is subdivided. For example, you might stock pipe by the linear foot. You can see that you have 1000 total feet of pipe on hand, but you can also track what lengths of pipe are included in that 1000 feet.

Setting Up Attributes

Use the Attributes Setup tab on the **Items** form to enable and configure item attributes, lot attributes and tracking of pieces:

- The **Item Attribute Group** field lists attribute groups that were defined on the **Item Attributes** form. When you select a group and save the record, the Attributes tab is enabled on the **Items** form.

- The **Lot Attribute Group** field lists groups defined on the **Lot Attributes** form. When you select a group and save the record, the Attributes tab is enabled on the **Lots** form.

- The **Piece Dimension Group** field lists groups defined on the **Pieces Dimensions** form. This field is enabled when you select **Enable Pieces Inventory.** When you select a group and save the record, the **Pieces** button is enabled. If **Enable Pieces Inventory** is checked, and you do not select a Piece Dimension Group, an error message displays when you save the item record. If pieces for this item exist, the **Pieces Dimension Group** field is disabled. In that case, the only way to change the Piece Dimension Group for the item is to go to the **Pieces** form, delete all pieces for this item, return to the **Items** form, refresh, and then change the value in the field.

Serial Number Tracking

An item cannot use both pieces and serial number tracking. If the **S/N Track** check box on the Items Control tab of the **Items** form is checked, the **Piece Inventory** check box is disabled, and vice versa.

Transactions

The flowchart below illustrates how transactions are entered for items with pieces that are being tracked.
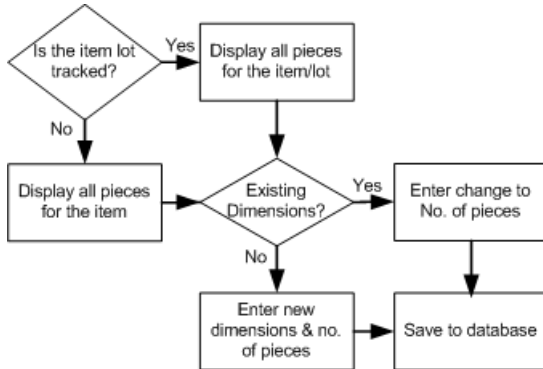
About Unit of Measure

You define units of measure on the Unit Of Measure Codes form. You can establish relationships between existing units of measure on the Unit of Measure Conversion form.

All inventoried items must be associated with a unit of measure that you define on the Items form. This U/M is called the base unit of measure.

To change the base unit of measure for an item, the following conditions must be met:

- The quantity on hand must equal zero.
- The item must not be in use on any purchase order, history purchase order, PO requisition, customer order, job material, ECN, transfer, estimate, or estimate job.

The display formats for quantity fields throughout the system are defined through decimal format fields on the Inventory Parameters form. The display formats for the cost, price, amount, and amount total decimal fields are controlled by decimal format fields on the Currency Codes form. All decimal format fields have ten decimal places.

Example: Unit of Measure Conversion

Use caution in setting up and maintaining the Unit of Measure Conversions where two units of measure have previously been defined. This becomes more apparent with the following example, where conversions have been set up at different levels.

Unit of Measure Conversion Example						
Level	Base U/M	Converted U/M	Conversion	Type	Item	Vend/Cust
(a)	Box	EA	10.00000000	Global		
(b)	Box	EA	12.00000000	Item	FA-10000	
(c)	Box	EA	24.00000000	Vendor	FA-10000	9

In the above scenario, if level (a) is the existing conversion and two new conversion levels - (b) and (c) - are created, then the following happens:

- All CO and PO transactions involving item FA-10000 use the level (b) conversion; however, any PO transactions involving item FA-10000 and Vendor 9 use the level (c) conversion instead.
- All transactions with items other than FA-10000 use the level (a) conversion.

Reciprocal Conversion

The system calculates the inverse conversion value when needed. Inverse conversion records are not required or automatically created.

Multi-Site Conversion

If an item has the same unit of measure at different sites, no conversions take place.

If an item has different units of measure at different sites, then the system will perform a Units of Measure Conversion.

Example

Item	Unit of Measure	Quantity	Site
XYZ	Feet	1	A
XYZ	Inches	12	B

Assumptions:

- A valid Unit of Measure Conversion has been established between Site A and Site B.
- A valid Unit of Measure Conversion has been established between Site B and Site A.
- A user at Site A has requested the Item Availability form for item XYZ with a view comprising of Sites A and B. In this scenario, Site A is considered to be the 'local' Site and Site B is considered to be the 'remote' site.

The system performs the following background process prior to the Pegging Display form being displayed. During the record gathering phase, the system converts the quantities according to the base unit of measure for the item at the 'remote' Site into the 'local' base unit of measure using the local conversion table.

This means that in the above example, the quantity of item XYZ at Site B is converted from Inches to Feet by using the Unit of Measure Conversion established at Site A. The Item Availability form displays the quantities of XYZ at Site A in Feet, in this example, 1. The same form also displays the quantities of XYZ at Site B in Feet, in this example.

NOTE: We recommend that consistent Unit of Measure Conversions be established at all sites. For example, the same conversion factor for Feet and Inches should be used between Site A and Site B, AND ALSO between Site B and Site A. This will prevent rounding problems.

Setting Up Serial Numbers

Setting Up Serial Number Processing

A serial number can be assigned to each item. This number can be used in tracking the item through the system. To set up serial number processing:

1 In the Inventory Parameters form, determine how you want to set the following global parameters that apply to all inventory items. Some of these values can be overridden for specific items or transactions.

- S/N Track
- Expand S/N
- Preassign Serials
- Use Existing Serials
- S/N Prefix
- Generate Unique S/N
- Backflush Serial Numbers

2 In the Items form, for each serial-tracked item, set these parameters:

- S/N Track
- Preassign Serials
- S/N Prefix

3 To assign serial numbers to specific items:

- If **Preassign Serials** was selected for the item, you can preassign serial numbers when you create purchase order lines, transfer order lines, or jobs. See Preassigning Serial Numbers.
- Use inventory receiving transactions such as Miscellaneous Receipt or **Purchase Order Receiving** to add the serial-tracked items to your inventory, adding serial numbers for the items through the Serial Numbers tab on these forms.

Additional Notes

- When receiving or creating inventory, all serial-tracked items must be assigned a serial number. The forms for these transactions include a Serial Numbers tab or area that is enabled when you enter a serial-tracked item.
- Serial numbers can be reused.
- To view all activity against a serial number, run the Transactions by Serial Number Report.
- To track where serial numbers are used, see Tracking Serialized Materials.

Assigning New Serial Numbers

When a quantity of a serial-tracked item is added to inventory through a receipt, you must assign serial numbers for each item received. This is handled on the transaction form's **Serial Numbers** tab.

You can optionally preassign serial numbers for a particular purchase order, transfer order, or job transaction. For more information, see Preassigning Serial Numbers.

1   In the transaction form, enter the item number, quantity, and any other required information (such as location). The **Serial Numbers** tab is activated, which indicates that the item is serial-tracked.

2   In the **Serial Numbers** tab, the **Target Qty** and **Generate Qty** default to the value of the **Quantity** field in the Detail tab. If necessary, change the **Generate Qty**. It should indicate how many serial numbers you want to generate and move to inventory.

3   Create new serial numbers, up to the quantity of the item. Use any of these methods:

- In the grid, enter new serial numbers. Use any prefix and field format, up to 30 characters.

- To generate a range of serial numbers, click **Generate**. The system starts the generated serial number list by using the next sequential serial number, and continues generating numbers until the item's quantity is reached. You can then change the generated serial numbers. (The Generate button is enabled only if the **Expand S/N** field is selected in the **Inventory Parameters** form.)

- For preassigned serial numbers, you do not need to click **Generate**. The grid displays all unreceived preassigned serials, and a number corresponding to the quantity being received is displayed automatically. However, you can generate new serial numbers if you want to, instead of using the preassigned ones.

- Use a combination of generated and manually created serial numbers.

4   In the grid, select or deselect the serial numbers to use for the transaction. If you deselect a row in the grid, it is deleted.

5   When you process the transaction, the selected serial numbers are included with the transaction. When the transaction status is "complete" or "closed," any preassigned numbers that are not used go back into the pool for use with another transaction if the prefix matches.

6   To specify other information about a new serial number, use the **Serial Numbers** form.

NOTE: To create new system serial numbers for a **Vendor Ship Notice** (GRN) where vendor-assigned serial numbers exist, use the **Vendor Serial** button instead of the **Generate** button. Vendor-assigned serial numbers come into the system only through EDI transactions.

Preassigning Serial Numbers

You can preassign serial numbers for items when you create a purchase order, a transfer order line, job, or co-job. Then when the PO or transfer order line is received, or the job completes, the system assigns one of the preassigned serial numbers to each item in the line or job.

Initial Steps

Use these initial steps to preassign serials for items in POs, transfer orders, job, or co-jobs:

1   On the **Items** form, specify that the item to be used in the PO, transfer, job or co-job is **S/N Tracked**.

2   (Optional) If you want to use serial number prefixes for this item, click **S/N Definition** and define the prefix to use. Alternatively, a global prefix can be defined on the **Inventory Parameters** form.

Preassign Serial Numbers for a Purchase Order

Use these steps to preassign serials for an item in a PO:

1   Follow the initial steps above.

2   Create the purchase order using the **Purchase Orders** form. (The Preassign feature is not available on the **Purchase Orders Quick Entry** form.)

3   On the **Purchase Order Lines** or **Purchase Order Blanket Lines/Releases** form, for each line item that will use a preassigned serial, select **Preassign Serials**.

   NOTE: If **Preassign Serials** is already selected by default for the item on the **Items** form, you cannot change it here. If this field was not selected on the **Items** form, and if **Qty Shipped** is zero, you can select it here.

4   On the **Purchase Order Lines** or **Purchase Order Blanket Releases** form, select the **Serials** tab. The amount of serial numbers to generate displays automatically, based upon the **Qty Ordered** for the purchase order line item.

5   Click **Generate Serial**. The next sequential serials available for this item are listed. (The **Generate Serial** button is enabled only if the **Expand S/N** field is selected in the **Inventory Parameters** form. If the button is disabled, specify the new serial numbers in the grid.)

6   Select the ones you want to use for this PO.

7   Save the PO line/release record.

Preassign Serial Numbers for a Transfer Order

Use these steps to preassign serials for an item in a transfer order:

NOTE: In order to preassign serial numbers for a transfer order, the item must be serial tracked in the "To" site and **not** serial tracked in the "From" site.

1   Follow the initial steps above.

2   Create the transfer order using the **Transfer Orders** form. (The Preassign feature is not available on the **Transfer Orders Quick Entry** form.)

3   On the **Transfer Order Lines** form, for each line item that will use a preassigned serial, select **Preassign Serials**.

NOTES:

- If **Preassign Serials** is already selected by default for the item on the **Items** form, you cannot change it here. If this field was not selected on the **Items** form, and if **Qty Shipped** is zero, you can select it here.

- Creating preassigned serial numbers is only permitted at the "To" site.

- Preassigned serial numbers are allowed for transfer orders only when one of these conditions is true:

  - The **Use Existing Serials** flag on the **Inventory Parameters** form is not selected, or

  - The "from" site is not serial-tracking an item and the "to" site is serial-tracking an item.

4   On the **Transfer Order Lines** form, select the **Serials** tab. The amount of serial numbers to generate displays automatically, based upon the **Qty Ordered** for the transfer order line item.

5   Click **Generate Serial**. The next sequential serials available for this item are listed. (The **Generate Serial** button is enabled only if the **Expand S/N** field is selected in the **Inventory Parameters** form. If the button is disabled, specify the new serial numbers in the grid.)

6   Select the ones you want to use for this transfer order.

7   Save the transfer order line record.

Use this chart to understand when the Preassign Serials fields are enabled, and how the default value is set:

From Site		To Site				Preassigned Serials Check Box	
Use Existing Serials?	Serial Tracked?	Serial Tracked?	Preassigned?	Ship Qty	Enabled?	Value	
Yes	--	--	--	--	No	Not Selected	
No	Yes	--	--	--	No	Not Selected	
No	No	Yes	No	No	Yes	Not Selected	
No	No	Yes	No	< > 0	No	Not Selected	
No	No	Yes	Yes	--	No	Selected	

Preassign Serial Numbers for a Job

Use these steps to preassign serials for an item when you create a job that includes the item:

1   Follow the initial steps above.

2   Create the job using the **Job Orders** form.

3   For each item that will use a preassigned serial, select **Preassign Serials**.

NOTE: If **Preassign Serials** is already selected by default for the item on the **Items** form, you cannot change it here. If this field was not selected on the **Items** form, you can select it here. When the Job status is no longer **Firm**, this field is disabled.

4   Select the **Serials** tab. The amount of serial numbers to generate displays automatically, based upon the **Qty Released** for the job.

5   Click **Generate Serial**. The next sequential serial numbers available for this item are listed. (The **Generate Serial** button is enabled only if the **Expand S/N** field is selected in the **Inventory Parameters** form. If the button is disabled, specify the new serial numbers in the grid.)

6   Select the ones you want to use for this transfer order.

7   Save the job order.

If you rework a job, the preassigned serial fields are disabled. See Creating a Rework Order for more information.

Preassign Serial Numbers for a Co-job

Use these steps to preassign serial numbers for an item when you create a co-job that includes the item:

1   Follow the initial steps above.

2   Create the job using the Co-job Orders form. (This form is available only if you are using the Molding Industry Pack.)

3   For each item that will use a preassigned serial number, select Preassign Serials in the grid.

NOTE: If Preassign Serials is already selected by default for the item on the Items form, you cannot change it here. However, if this field is not selected on that form, then you can select it here. When the job status is changed from Firm, this field is disabled.

4   Click the Preassign Lots/Serials button and on the form that opens, select the Serials tab. The amount of serial numbers to generate is displayed automatically, based upon the Released quantity for the job.

5   Click Generate Serial. The next sequential serial numbers available for this item are listed. (The Generate Serial button is enabled only if the Expand S/N field is selected in the Inventory Parameters form. If the button is disabled, specify the new serial numbers in the grid.)

6   Select the ones to use for this order.

7   Save the co-job order.

Printing Preassigned Serial Number Labels

To print preassigned serial number labels so that you can have them ready to attach when the items are created or received, use the **Preassigned Serial Labels Report** form.

Data Collection Transactions and Preassigned Serial Numbers

If you are populating the data collection tables with transactions that use preassigned serial numbers:

1   When you print a report for a specific type of DC transaction (for example, **PO Receiving List**), select the option to print preassigned serial numbers where appropriate.

2   Use the document to scan (or manually enter) the preassigned serial numbers. At the time the data collection transactions are entered , you can choose to enter a value other than the preassigned serial number.

What Happens to Unused Preassigned Serial Numbers?

Preassigned serial numbers are allocated and cannot be reused until the PO line, job or transfer order line status is set to **Complete**.

If, for example, you preassign 10 serial numbers to a purchase order, then when you receive items against the purchase order, all 10 serial numbers are listed in the **Serial Numbers** tab for the transaction. If you only receive 8 of the item and then close the purchase order, the remaining 2 serial numbers go back into the "pool" and can be assigned to another PO if the prefix matches. However, as long as the PO stays open, the serial numbers cannot be reused.

Defining "Intelligent" Lot and Serial Numbers with Prefixes

You can assign prefixes to lot and serial numbers that include variable information such as the current month/day/year, the site, the reference type/number/suffix, and/or a literal value, as well as any constant values you specify.

You can also still type in a standard prefix such as "SN-".

Maximum size for lot numbers, including the prefix, is 15 characters. Maximum size for serial numbers, including the prefix, is 30 characters.

Defining an Intelligent Lot Prefix

To define an intelligent prefix to use with lot numbers:

1   Click **Lot Definition** on one of these forms:

- For a global lot prefix that applies to all items, click **Lot Definition** on the **Inventory Parameters** form.

- For a lot prefix that applies to a specific item, click **Lot Definition** on the **Items** or **Multi-Site Items** form. This prefix overrides any global lot prefix.

2   On the **Prefix Definition** form, add a line for each segment of the prefix.

3   To specify the segments of the prefix:

- Click in the **Segment Value** field and select from the list of placeholder options. See the table below for explanations of the options.

- You can include as many segments as you need in the prefix. However, the lot length is limited to 15 characters. If you specify a prefix that could be greater than or equal to the limit, you receive a warning.

- To include a constant, for example a hyphen, specify **Constant** in the **Segment Value** field and then specify the character(s) in the **Segment Placeholder Value** field.

- To change the order of the segments, click the **Up** and **Down** buttons.

- The full prefix (using placeholders) is displayed in the **Prefix** field.

4   Click **OK** to return to the previous form, where the prefix is displayed in the **Lot Prefix** field.

Defining an Intelligent Serial Number Prefix

To define an intelligent prefix to use with serial numbers:

1   Click **S/N Definition** on one of these forms:

- For a global serial number prefix that applies to all items, click **S/N Definition** on the **Inventory Parameters** form.

- For a serial number prefix that applies to a specific item, click **S/N Definition** on the **Items** or **Multi-Site Items** form. This prefix overrides any global serial number prefix.

2   On the **Prefix Definition** form, add a line for each segment of the prefix.

3   To specify the segments of the prefix:

- Click in the **Segment Value** field and select from the list of placeholder options. See the table below for explanations of the options.

- You can include as many segments as you need in the prefix. However, the serial number length is limited to 30 characters. If you specify a prefix that could be greater than or equal to the limit, you receive a warning.

- To include a constant, for example a hyphen, specify **Constant** in the **Segment Value** field and then specify the character(s) in the **Segment Placeholder Value** field.

- To change the order of the segments, click the **Up** and **Down** buttons.

- The full prefix (using placeholders) is displayed in the **Prefix** field.

4   Click **OK** to return to the previous form, where the prefix is displayed in the **S/N Prefix** field.

Prefix Segments and Placeholders

On the **Prefix Definition** form, select from the options in this table to create the segments of the prefix. After you specify the segments and the order, they display in the **Lot Prefix** or **S/N Prefix** field as tokens, or placeholders, that are replaced by the assigned values when the numbers are actually generated. See our examples.

NOTE: We recommend that Ref Num, Ref Line/Suffix, and Ref Release placeholders should be followed by a constant value of a hyphen (-) to ensure that results are as expected. We suggest that you use a hyphen because many other characters cannot be read in a bar code.

Placeholder	Option Description	Number of characters	Notes
&M	Month	2	
&D	Day	2	
&Y	Year	2	
&Z	Year	4	
&T	Reference Type	1	Character value based on the transaction type: C - Project I - Inventory(JIT/Kanban, Misc Receipts, etc.) J - Job O - Customer order P - Purchase order R - RMA S - Production schedule T - Transfer order
&N	Reference Number	10 (TRIM)	Value based on the transaction type: Project number Inventory - None Job number Customer order number Purchase order number Production schedule number Transfer order number
&L	Reference Line	4	Value based on the transaction type:

	or Suffix		Project task Inventory - None Job suffix Customer order line number Purchase order line number RMA line number Production schedule - None Transfer order line number
&R	Reference Release		Value based on the transaction type: Project sequence Inventory - None Job - None Customer order line release (if 0 then none) Purchase order line release (if 0 then none) RMA - None Production schedule - None Transfer order - None
&S	Site	8 (TRIM)	Alphanumeric site ID
&&	Literal Value "&"	1	
(Constant)	Constant value		Specify a value in the Placeholder Value field. These are static characters that are included in the prefix. For example, you can use a hyphen (-) to separate the segments, or include SN- to indicate that this is a serial number.

Selecting Existing Serial Numbers

When a serial-tracked item is shipped, moved, returned, or declared a loss, you must indicate that item's serial number(s) in the transaction form's Serial Numbers tab.

1 Enter the item number, quantity, and any other required information (such as location). The Serial Numbers tab is then activated, indicating the item is serial-tracked.

2   In the Serial Numbers tab, the Target Qty, Generate Qty, and Range Qty default to the value of the Quantity field in the Detail tab. If necessary, change the Generate Qty. It should indicate how many serial numbers you want listed, in order to make your selections.

3   Click **Generate** to start Filter-in-Place mode and activate the Serials grid.

4   In the S/N field, enter any filtering criteria to use to select the range of serial numbers to display.

5   Click the filter-in-place button. A list of existing serial numbers matching your filter criteria is retrieved from the database and displayed in the grid. The list contains the amount of serial numbers specified in the Generate Qty.

6   Select the serial numbers to use for the transaction. Use either of these methods:

   - In the grid, click the Select check box to select each serial number you want.
   - To select a range of numbers, manually select the first number you want; then, in the Range Qty field, enter the amount of serial numbers to select (by default, this value matches the Target Qty). Then click **Select Range** to select the following serial numbers in the grid, up to the Range Qty value.

7   When you process the transaction, the selected serial numbers are included with the transaction.

NOTE: To select new system serial numbers for a Vendor Ship Notice (GRN) where vendor-assigned serial numbers exist, use the **Vendor Serial** button instead of the Generate button. Vendor-assigned serial numbers come into the system only through EDI transactions.

"Intelligent" Serial Number Prefixes: Examples

These examples show serial numbers for job and miscellaneous receipt transactions that were created using prefix definitions.

NOTE: Separate sections of data with a hyphen (-), especially when reference number, line-suffix, and release are used. This makes the serial number more readable and ensures that you get the expected results. Hyphens are defined via constants on the **Prefix Definition** form.

Example 1

Transaction description:
Job 1
Suffix 0000
qty = 5
Site OH
Expand Serial on

Prefix definition placeholders:
SN-&S-&T-&N-&L-
where SN and the hyphens are defined via constants.

Generated serial numbers:
SN-OH-J-1-0000-000000000000000001
SN-OH-J-1-0000-000000000000000002
SN-OH-J-1-0000-000000000000000003

SN-OH-J-1-0000-0000000000000000004
SN-OH-J-1-0000-0000000000000000005

Example 2

Transaction description:
Job 1
Suffix 0000
qty = 4
Site OH
Expand Serial on

Prefix definition placeholders:
SN-&S-&T-&N-

Generated serial numbers:
SN-OH-J-1-00000000000000000001
SN-OH-J-1-00000000000000000002
SN-OH-J-1-00000000000000000003
SN-OH-J-1-00000000000000000004

Example 3

Transaction description:
Job 100
Suffix 0000
qty = 5
Site OH
Expand Serial off

Prefix definition placeholders:
SN-&S-&T-&N-&L-

Generated serial numbers:
SN-OH-J-100-0000-1
SN-OH-J-100-0000-2
SN-OH-J-100-0000-3
SN-OH-J-100-0000-4
SN-OH-J-100-0000-5

Example 4

Transaction description:
Misc Receipt
qty = 5
Site OH
Expand Serial on

Prefix definition placeholders:
SN-&S-&T-&N-&L-

Generated serial numbers:
SN-OH-I--00000000000000000001
SN-OH-I--00000000000000000002

SN-OH-I--00000000000000000000003
SN-OH-I--00000000000000000000004
SN-OH-I—00000000000000000000005

In this example there are two hyphens (--) next to each other because inventory transactions do not have a line-suffix value.

Handling PO Receipts and Returns for Serial Tracked Items

The following types of purchase order receipt or return of serialized items are handled through the **Purchase Order Receiving** form's Serial Numbers tab:

- **Positive Receipt -** When the DR Return field is not selected and the Qty Received is greater than 0, use the **Generate** button and the **S/N Prefix** to generate a quantity of new serial numbers equal to the Generate Qty value.

  The grid displays any preassigned serial numbers associated with the line item. The system selects the number of S/Ns that corresponds to the receipt quantity, starting with the first number. You can select different S/Ns to receive, or generate and enter new S/Ns. when the receipt is processed, the status of the S/Ns changes from Preassigned to Inventory.

- **Negative Receipt -** When the DR Return field is not selected and the Qty Received is less than 0, use the Generate button to initialize Filter-in-Place. When you complete the filter, the system returns a quantity of serial numbers with status "I" in inventory, equal to the Generate Qty value, using any specified filter criteria.

  Only serial numbers that are currently in stock and that were received against the current PO and line can be selected.

- **Debit Return -** When the DR Return field is selected and Qty Received is greater than 0, use the Generate button to initialize Filter-in-Place. When you complete the filter, the system returns a quantity of serial numbers with status "O" in inventory, equal to the Generate Qty value, using any specified filter criteria.

  Only serial numbers that are currently in stock and that were received against the current PO and line can be selected.

- **Negative Debit Return -** When the DR Return field is selected and Qty Received is less than 0, use the Generate button to initialize Filter-in-Place. When you complete the filter, the system returns a quantity of serial numbers with status "I" in inventory, equal to the Generate Qty value, using any specified filter criteria.

  The grid displays any preassigned serial numbers associated with the line item. The system selects the number of S/Ns that corresponds to the receipt quantity, starting with the first number. You can select different S/Ns to receive, or generate and enter new S/Ns. when the receipt is processed, the status of the S/Ns changes from Preassigned to Inventory.

Tracking Serialized Materials

You can track serial numbers used in jobs through multiple job levels. You can track in either direction:

- Backward, to determine which serialized items make up a final serialized item.
- Forward, to determine which item a serialized item ultimately ends up in.

Notes

- In order to track serial numbers for an item in a job beyond the first level, the **Preassign Serials** option must be set for the item.
- If a serial number has a source or destination that is a transfer order, then visibility of the serial number in this site ends at the transfer order. To further track the serial number, go to the transfer site and continue tracking there. See About Multi-Site Transfer Order Serial Number Tracking.

Using the Serial Numbers Form

To track serial numbers:

1 On the **Serial Numbers** form, specify the item and serial number to track.

2 Select the Serial Source tab. The tab displays the root node of a tree.

3 Click on nodes to expand the information. The tree initially shows the source transaction of the serial/item. If that transaction is a job, the tree includes additional nodes for any serial/item materials in that job, as well as nodes for the source of those serial/items. If there are transactions in any nodes that do not contain a serial number, but contain a lot number, the node shows the source information for the lot.

4 Continue through the nodes until there are no more job sources, or job sources with serial and/or lot item materials.

Using the Serial Numbers Report

To track serial numbers:

1 On the **Serial Numbers Report** form, specify the range of items and serials numbers to include.

2 In the **Display Source** field, specify:

- **Summary** to show only the immediate source transaction.
- **Detail** to show the detail of source jobs, where those jobs contain serial items that themselves have a source. Additional levels are indented on the report.

3 In the **Display Destination** field, specify:

- **Summary** to show only the immediate destination transaction.
- **Detail** to show the detail of destination jobs, where these jobs contain serial items that themselves have a destination. Additional levels are indented.

4 Click **Print**.

Setting Up Lots

Creating Lot Tracked Inventory Items

For an inventory item to use the system's lot-tracking capabilities, on the Items or Multi-Site Items form, the **Lot Track** check box must be selected at the individual inventory item level.

Inventory items can be both lot-tracked and serial-tracked.

To create a lot-tracked inventory item:

1   Open the Items or Multi-Site Items form.

2   Select the Controls tab.

3   Enter the appropriate data in the required fields for lot-tracking:

- **Lot Track** - Select this check box if the inventory item is to be lot-tracked.
- **Issue By** - Accept the default, which is **Lot**.

Optional fields include:

- **Preassign Lots** - Allow the creation of lot numbers for this inventory item before the item is received or used in a job. See Preassigning Lot Numbers for more information.
- **Lot Prefix** - Specify a lot prefix for this inventory item. You can specify a default here or use intelligent lot numbers.
- **Backflush** - If this inventory item can be backflushed, select this check box.
- **Reservable** - If this inventory item can be reserved, select this check box.
- **Shelf Life** - Enter a value in days for how long a lot can stay in inventory before it expires.

4   Select Actions > Save.

NOTE: When receiving or creating inventory, all lot-tracked items must be assigned a lot. Inventory can be assigned to either an existing lot or a new lot. Lots can be created by preassigning them, by performing any inventory transaction or by adding the new lot using the **Lots** form.

Preassigning Lot Numbers

You can preassign lot numbers for items when you create a purchase order, a transfer order line, a job or a co-job. Then when the PO or transfer order line is received, or the job completes, the system assigns one of the preassigned lot numbers to each item in the line or job.

Initial Steps

Use these initial steps to preassign lots for items in POs, transfer orders, jobs, or co-jobs:

1   In the **Items** form, specify that the item to be used in the PO, transfer, job, or co-job is **Lot Tracked**.

2   (Optional) If you want to use lot number prefixes for this item, click **Lot Definition** and define the prefix to use. Alternatively, a global prefix can be defined on the **Inventory Parameters** form.

Preassign Lots for a Purchase Order

Use these steps to preassign lots for an item in a PO:

1   Follow the initial steps above.

2   Create the purchase order using the **Purchase Orders** form. (The Preassign feature is not available on the **Purchase Orders Quick Entry** form.)

3   In the **Purchase Order Lines** or **Purchase Order Blanket Lines/Releases** form, for each line item that will use a preassigned lot, select **Preassign Lots**.

    NOTE: If **Preassign Lots** is already selected by default for the item on the **Items** form, you cannot change it here. However, if this field is not selected, and if **Qty Shipped** is zero, then you can select **Preassign Lots** here.

4   In the **Purchase Order Lines** or **Purchase Order Blanket Releases** form, select the **Lots** tab.

5   Specify the number of predefined lots to generate and click **Generate Lots.** The next sequential lot numbers available for this item are listed. (The **Generate Lots** button is enabled only if the **Generate Lot** field is selected in the **Inventory Parameters** form. If the button is disabled, specify the new lot numbers in the grid.)

6   Select the ones you want to use for this PO.

7   Save the PO line/release record.

Preassign Lots for a Transfer Order

Use these steps to preassign lots for an item in a transfer order:

NOTE: In order to preassign lots for a transfer order, the item must be lot tracked in the "To" site and **not** lot tracked in the From site.

1   Follow the initial steps above.

2   Create the transfer order using the **Transfer Orders** form. (The Preassign feature is not available on the **Transfer Orders Quick Entry** form.)

3   In the **Transfer Order Lines** form, for each line item that will use a preassigned lot, select **Preassign Lots**.

    NOTE: If **Preassign Lots** is already selected by default for the item on the **Items** form, you cannot change it here. However, if this field is not selected, and if **Qty Shipped** is zero, then you can select **Preassign Lots** here.

4   In the **Transfer Order Lines** form, select the **Lots** tab.

5   Specify the number of predefined lots to generate and click **Generate Lots.** The next sequential lots available for this item are listed. (The **Generate Lots** button is enabled only if the **Generate**

Lot field is selected in the **Inventory Parameters** form. If the button is disabled, specify the new lot numbers in the grid.)

6 Select the ones you want to use for this transfer order.

7 Save the transfer order line record.

Use this chart to understand when the Preassign Lots fields are enabled, and how the default value is set:

From Site		To Site			Preassigned Lots Check Box	
Use Existing Lots?	Lot Tracked?	Lot Tracked?	Preassigned?	Ship Qty	Enabled?	Value
Yes	--	--	--	--	No	Not Selected
No	Yes	--	--	--	No	Not Selected
No	No	Yes	No	No	Yes	Not Selected
No	No	Yes	No	< > 0	No	Not Selected
No	No	Yes	Yes	--	No	Selected

Preassign Lots for a Job

Use these steps to preassign lots for an item when you create a job that includes the item:

1 Follow the initial steps above.

2 Create the job using the **Job Orders** form.

3 For each item that will use a preassigned lot, select **Preassign Lots**.

   NOTE: If **Preassign Lots** is already selected by default for the item on the **Items** form, you cannot change it here. However, if this field is not selected on that form, then you can select **Preassign Lots** here. When the job status is changed from **Firm**, this field is disabled.

4 Select the **Lots** tab.

5 Specify the number of predefined lots to generate and click **Generate Lots.** The next sequential lots available for this item are listed. (The **Generate Lots** button is enabled only if the **Generate**

>   **Lot** field is selected in the **Inventory Parameters** form. If the button is disabled, specify the new lot numbers in the grid.)

6   Select the ones you want to use for this transfer order.

7   Save the job order.

If you rework a job, the preassigned lots/serials fields are disabled. See Creating a Rework Order for more information.

Preassign Lots for a Co-job

Use these steps to preassign lots for an item when you create a co-job that includes the item:

1   Follow the initial steps above.

2   Create the job using the Co-job Orders form. (This form is available only if you are using the Molding Industry Pack.)

3   For each item that will use a preassigned lot, select Preassign Lots in the grid.

   NOTE: If Preassign Lots is already selected by default for the item on the Items form, you cannot change it here. However, if this field is not selected on that form, then you can select it here. When the job status is changed from Firm, this field is disabled.

4   Click the Preassign Lots/Serials button and on the form that opens, select the Lots tab.

5   Specify the number of predefined lots to generate and click Generate Lots. The next sequential lots available for this item are listed. (The Generate Lots button is enabled only if the Generate Lot field is selected in the Inventory Parameters form. If the button is disabled, specify the new lot numbers in the grid.)

6   Select the ones to use for this order.

7   Save the co-job order.

Printing Preassigned Lot Labels

To print preassigned lot labels so that you can have them ready to attach when the lots are created, use the **Preassigned Lot Labels Report** form.

Data Collection Transactions and Preassigned Lot Numbers

If you are populating the data collection tables with transactions that use preassigned lot numbers:

1   When you print a report for a specific type of DC transaction (for example, **PO Receiving List**), select the option to print preassigned lot numbers where appropriate.

2   Use the document to scan (or manually enter) the preassigned lot numbers. At the time the DC transactions are entered, you can choose to enter a value other than the preassigned lot number.

What Happens to Unused Preassigned Lot Numbers?

Preassigned lot numbers are allocated and cannot be reused until the PO line, job or transfer order line status is set to **Complete**.

Tracking Lot-Controlled Materials

You can trace lot numbers through multiple transaction or job levels. You can trace lots forward, to determine the ultimate item in which a lot-tracked item is included.

Using the Lots Form

To trace lots:

1   On the **Lots** form, specify the item and lot number to trace.

2   Select the Lot Trace tab. The tab displays the root node of a tree.

3   Click on nodes to expand the information. The tree initially shows the source transaction of the lot/item. If that transaction is a job, the tree includes additional nodes for any lot/item materials in that job, as well as nodes for the source of those lot/items.

4   Continue through the nodes until there are no more job sources, or job sources with lot item materials.

Using the Lot Traceability Report

To trace lots:

1   On the **Lot Traceability Report** form, specify the range of items and lot numbers to include.

2   In the **Summary or Detail** field, specify:

   - **Summary** to show only the immediate source transaction.
   - **Detail** to show the detail of source jobs, where those jobs contain lot items that themselves have a source. Additional levels are indented on the report.

3   Click **Print**.

Multi-Site Transfer Orders

For information about moving lot-tracked transfer orders between sites, see About Multi-Site Transfer Order Lot Tracking.

Splitting Job Lots with Preassigned Lots or Serials

If a job is being split that has preassigned lots or serial numbers, use the Lots or Serials tabs on the **Job Lot Splitting** form to indicate which lot and serial numbers are being split off to the new job.

NOTE: If Generate Unique Lot or Generate Unique S/N is selected on Inventory Parameters, and you perform a job lot split, the original job's reference number or suffix will continue to be used.

The Lots tab lists all preassigned lot numbers. Select **Split Off** for each lot number that you want to assign to the new lot. At least one preassigned lot number must be selected before you process the split.

The Serials tab lists all preassigned serial numbers. In the **Target Qty** field, specify how many serial numbers you want to assign to the new lot, and click **Select Range** to select that number of lines from the grid.

Click **Process** to split the job.

Lot Expiration Examples

These examples are intended to illustrate how MRP Planning utilizes lot expiration dates.

Example 1 - Expired Lots and Expiring Lots Not Fully Allocated

Item 100 has a shelf life of 30 days, and an order minimum/multiple of 10.

Existing Lots

Lot	Quantity on Hand	Expiration Date
A	10	April 30

B	10	June 30

Demand

Ref	Quantity	Due Date
CO-1	5	June 15
CO-2	2	July 15
CO-3	3	October 1

Given a current date of **June 1**, this table illustrates how expired and expiring lots affect order planning

Date	Receipt Quantity	Requirement Quantity	Projected On Hand	Comment
Balance on Hand			10	Lot A is excluded from balance on hand because it has already expired
June 15	0	5	5	Demand for CO-1 consumes 5
June 30	0	5	0	Remainder of Lot B expires, leaving 0 on hand
July 15	10	0	10	PLN-1 created (Exp. Date = July15 + 30 days)
July 15	0	2	8	Demand for CO-2 consumes 2
August 14	0	8	0	Remainder of PLN-1 lot expires before being consumed
October 1	10	0	10	PLN-2 created
October 1	0	3	7	Demand for CO-3 consumes 3
October 30	0	7	0	Remainder of PLN-2 lot expires

Example 2 - Fully Allocated Lots

Item 100 has a shelf life of 30 days, and an order minimum/multiple of 10.

Existing Lots

Lot	Quantity on Hand	Expiration Date
A	10	June 30
B	10	July 30

Demand

Ref	Quantity	Due Date
CO-1	12	June 15
CO-2	5	July 15
CO-3	3	October 1

Given a current date of **June 1**, this table illustrates how expired and expiring lots affect order planning

Date	Receipt Quantity	Requirement Quantity	Projected On Hand	Comment
Balance on Hand			20	
June 15	0	12	8	Demand for CO-1 consumes 12 (lot A completely consumed)
July 15	0	5	3	Demand CO-2 consumes 5
July 30	0	3	0	Remainder of lot B expires
October 1	10	0	20	PLN-1 created
October 1	0	3	7	Demand CO-3 consumes 3

October 30	0	7	0	Remainder of PLN-1 lot expires

Example 3 - Using Shelf Life to Plan Scheduled Receipts

Item 100 has a shelf life of 30 days, and an order minimum/multiple of 10.

Existing Lots

Lot	Quantity on Hand	Expiration Date
A	10	June 30
B	10	July 30

Demand

Ref	Quantity	Due Date
CO-1	12	June 15
CO-2	5	July15
CO-3	3	October 1

Scheduled Receipts

Ref	Quantity	Due Date
PO-1	10	September 30

Given a current date of **June 1**, this table illustrates how expired and expiring lots affect order planning

Date	Receipt Quantity	Requirement Quantity	Projected On Hand	Comment
Balance on Hand			20	

June 15	0	12	8	Demand for CO-1 consumes 12 (lot A completely consumed)
July 15	0	5	3	Demand CO-2 consumes 5
July 30	0	3	0	Remainder of lot B expires
September 30	10	0	10	Scheduled receipt of PO-1
October 1	0	3	7	Demand CO-3 consumes 3
October 30	0	7	0	Remainder of PLN-1 lot expires

Copying Items

To copy one or more items, including their stockroom locations, current bills of material, and user-defined fields:

1   Open the Copy Items form.

2   In the **From Items Beginning** field, type the first few alphanumeric characters of the items you want to copy.

The system uses the characters that you type in this field to search for all records of items that begin with the same characters. For more information, see From Items Beginning/From Item.

3   In the **To Items Beginning** field, type the alphanumeric characters you want to use as the prefix for the new items.

The characters that you type in this field appear at the beginning of every record in the **To Item** column of the grid after you click **Process**. For more information, see To Items Beginning/To Item.

4   Select or clear the three check boxes (**Copy User-Defined Fields**, **Copy Stockroom Locations**, and **Copy Current BOM**), according to which item components you want to include in the copy action.

5   In the **Effective** field, enter a date for which you want the copy action to be effective.

6   Verify that the **Preview** option is selected.

7   Click **Process**.

The system displays a list of all matches for items with the same first characters as those you typed in the **From Items Beginning** field.

8   In the **Select** column, select the item(s) you want to copy. If no items match what you expected or wanted, you can repeat Steps 2 through 7 until you obtain the desired results.

9   Verify that the **Commit** option is selected.

10   Click **Process**.

The system processes all selected items. If any items cannot be processed, the system displays the appropriate error message in the **Message** column.

Copying Items and Their BOMs to Other Sites

To copy an item to multiple sites in the same intranet, you can use the **Multi-Site Items** form. See Maintaining Items from a Master Site. However, this method does not copy the current BOM of the item. To copy the BOM for the item from one site to another, use the **Multi-Site Biil of Material Builder**.

Creating Units of Measure and Unit of Measure Conversion Records

Creating Units of Measure

To create a new unit of measure on the Unit of Measure Codes form, perform the following steps:

1   Verify that the unit of measure you want to create is not already in the system by scrolling through the list.

2   Click in the first empty row at the bottom of the list.

3   Enter the code for the new unit of measure (three-character maximum).

    NOTE: Where possible, select an ISO unit of measure from the drop-down list, rather than creating a custom U/M.

4   Enter the description of the unit of measure. (The description defaults from the **ISO Unit of Measure Codes** form if you selected an ISO U/M.)

5   If your planning mode is APS, specify the Planning Precision factor, if needed. This field is used for APS.

6   Close the form and save your changes.

Deleting Units of Measure

To delete a unit of measure from the system, perform the following steps:

1   Locate the unit of measure you want to delete by scrolling up and down the list.

2   Highlight the row containing the unit of measure to delete.

3   Press **Delete**. The row is marked for deletion.

4   Close the form and save your changes.

Creating Conversion Records

To create a new conversion record, perform the following steps:

1   Verify that the two units of measure you want to use for the conversion record are in the system by checking the Unit of Measure Codes form.

2   On the Unit of Measure Conversion form, select the Base U/M.

3   Specify the Converted U/M.

4   Specify the conversion record type (Global, Item, Customer, or Vendor).

5   Specify the item number (this field is only active if you selected Item, Customer, or Vendor as the conversion record type).

6   Specify the customer or vendor number (this field is only active if you selected Customer or Vendor as the conversion record type).

7   Specify the conversion factor. This number represents the mathematical relationship between the base unit of measure and the converted unit of measure.

8   Close the form and save your changes.

Maintaining Multi-Site Items from a Master Site

Use the Multi-Site Items form to maintain items for multiple sites on an intranet from the master site of the intranet. Keep in mind that each site can still control its local item records.

Adding Items

To add item for any site on the master site's intranet, follow the steps in Creating a New Item.

Copying Items to Other Sites

To copy an item to multiple sites in the same intranet from this form:

1   Select an existing item. The item must be defined as completely as possible before you copy it, and the item record must be saved at one of the shared sites in the master site's intranet.

2   Select **Actions > Multi-Site Copy**. The **Multi-Site Selection** form is displayed.

3   Select one or more groups from the list of site groups in the left pane. The left pane only lists site groups where all of these are true:

•   The site group includes the master site.

•   The site group includes the source site from which the selected record will be copied.

•   All sites in the group are on the master site's intranet

4   A list of the sites in those groups is displayed in the right pane. Select one or more sites to which you want to copy the item.

5   Click **OK** to return to the **Multi-Site Items** form.

6   Save your changes to add the duplicate item records to the other sites.

Note: This procedure does not copy the item's BOM. To copy an item's single-level current routing and BOM to the same item at other sites, see Copying a Multi-Site Item Bill of Materials.

Information Filtered by Site

You specify the site when you add an item. The following fields are filtered by the selected site. For example, when you add an item and specify Site B, you can only select product codes that are valid at Site B.

- Alternate Item
- U/M
- Product Code
- Unit Weight U/M
- Family Code
- Production Type
- Warehouse
- Setup Group
- Reason
- Backflush Location
- Preferred Co-product Mix
- Commodity
- Origin

The Buyer field is filtered by the master site. That is, the information in the drop-down list is from the master site, not the site you specified.

Maintenance Tasks Not Available from this Form

For most tasks, you can use the **Multi-Site Items** form in place of the **Items** form. However, these tasks can be performed only in the **Items** form at the specific site:

- Delete an item
- Add notes to the record
- Specify tax information
- Define item categories, attributes, and related items
- Provide a picture of the item
- Display the BOM view
- Define scheduler batches for the item, and set a few other APS-related options
- Use Actions menu "List" options

Managing Obsolete and Slow-Moving Inventory

1   Run the Item Not Used Report to identify items for which no material transactions have been recorded for the date range you specify. The results of this report may help you identify items that should be flagged as Obsolete or Slow-Moving.

2   Access the Items Controls tab.

3   Run the Item Where Used Report to determine where the items you plan to flag are currently used in the system. For all future transactions, the system will stop you from purchasing or manufacturing obsolete items, and will warn you when you purchase or manufacture a slow-moving item. However, it is up to you to discover and act upon all pre-existing transactions.

4   On the **Items** form, in the Item field, enter the item code for the item you wish to flag. The Description appears.

5   In the Material Status field, select **Obsolete** to flag the item as obsolete. Select **Slow-Moving** to flag the item as slow-moving. Accept the default of Active for all items which should be bought, sold, and made without restriction.

Or, you can change the status of a range of materials using the Change Item Status Utility.

6   If the Backflush check box is selected for this item on the **Items** Controls tab, clear the check box. You should not backflush items that are obsolete or slow-moving. The system will not display warning or error messages if you do backflush these items.

About Posting Cycle Count Quantities

After performing a cycle count, you must post the results of the count. The procedures for both the count and the posting are included in Doing a Cycle Count.

About Posting Counted Records

When you run the **Cycle Count Posting** activity, the system posts and deletes records that have the count quantity within the **Cycle Tolerance** cutoff quantity and which are not exceptions.

The **Cycle Count Posting** activity processes the cycle record using the following process:

1   The system checks to see if the actual count is different from the on-hand count already in the system.

   •   If the count is the same, there is nothing for the system to update, and it simply deletes the record.

   •   If the count is different, the system updates the location's on-hand quantity and the item's on-hand quantity.

2   The system creates a material transaction record with the following:

   •   Trans Type - B

   •   Ref Type - I

   •   Qty - the difference between actual (cycle) count and the computer-recorded count for the item.

3   The system posts the new quantity to the **Inventory Control Ledger Distribution** journal.

The **Cycle Count Adjustment Journal** reference **INV CC-A**; uses the following account numbers:

- Product Codes Inventory Adj account

    NOTE: If an account number is specified in the **Product Codes Cycle Inventory Adj** account field, the system uses that account instead.

- Item Location Inv Acct

4   Last, the system deletes the cycle count records and sets the **Last Count** field to today's date.

If no other cycle count records exist for this item, the **Cycle Triggered** and **Count in Process** options are cleared.

Exception Records

When it encounters an exception condition, the **Cycle Count Posting** activity changes the status of a record from **Counted** to **Exception**. The activity then proceeds to the next cycle count record.

Exception conditions include:

- The item is not in **Items**.
- The stockroom location is not found for the item.
- The reserved quantity is greater than the count quantity.
- The location on-hand quantity is not equal to the on-hand quantity when the cycle count record was generated.
- The reserved quantity is not equal to the on-hand quantity when the cycle count record was generated.
- The quantity counted exceeds the location on-hand quantity plus the **Product Code General** cycle tolerance.
- The lot number is invalid.
- The product code on the item is invalid.
- The serial number is invalid.
- The account is invalid.
- The unit code is invalid.
- The item denoted as tax-free does not have an Import Document ID.

If the activity encounters one of these conditions, the system changes the status from **Counted** to **Exception** and does not post the cycle record.

If the **Cycle Count Record** setting is changed to **Exception** because the current location's on-hand quantity is now different from the on-hand quantity when the count started or because the quantity counted exceeds the location on-hand quantity plus the **Product Code General** cycle tolerance, you can post the record using this activity. Make sure you change the **Cycle Status** field from **Counted** to **Exception**.

If the **Cycle Count Record** setting is changed to **Exception** for any other reason, you must correct the error condition in order to post the cycle count record. You can also delete the cycle count record from the cycle count.

Product Codes Overview

Product codes allow you to group similar types of items and assign each group an identifying code.

For example, you could group items and assign codes to them as follows:

Product Code	Description
PP	Purchased Parts
MI	Small Small Miscellaneous Items
EC	Dom Electronic Components for Domestic Use

You can set up system-wide parameters that affect all items. Using product codes, however, you can override the system-wide parameters for a smaller subset of items. Price markups, discounts, General Ledger accounts, and exception message tolerance factors (used by MRP and APS) can all be set up by product code.

In addition, when you generate many reports, you can enter product codes as selection criteria.

NOTE: The user must have authorization granted in order to create product codes.

Stockroom Activities

The system gives you several different ways to adjust your inventory. See these topics for details.

- Quantity Adjustment
- Quantity Move
- Miscellaneous Receipt
- Miscellaneous Issue
- Job Receipt

About Tax Free Imported Materials

Some countries require manufacturers to track the inventory movement of tax-free imported materials that are used to build products that, when completed, are shipped back to the country of origin.

The system allows you to track inventory as tax-free imported materials. You enable this functionality by selecting the Track Tax Free Imported Materials check box on the Inventory Parameters form.

You can set up tax systems within the system to allow for the exchange of materials without import tax, duties, or VAT on materials that are tracked as tax-free imported materials.

NOTE: Selecting Track Tax Free Imported Materials does not change how the system calculates taxes on these items. You must set up your tax systems appropriately. See Setting Up Tax Systems for more information.

Utilities for Tax-Free Materials

You can use these system utilities with tax-free imported materials:

- Delete Tax Free Imports. This utility deletes tax-free imports and associated records.
- Delete Tax Free Exports. This utility deletes tax-free exports and associated records.
- Tax Free Imported Materials Process Utility. Use this utility to search current BOMs and enable lot tracking for parent items that contain tax-free imported materials.

NOTE: Data Collection does not support the tracking of tax-free imported materials.

Using Tax-Free Imported Materials

Configure the System

1   On the Inventory Parameters form, select Track Tax-Free Imported Materials. The system then automatically selects the Lot Tracking field, and sets the Lot Track field, on the Items form, as selected, by default, when you add an item. Parent items that contain tax-free imported material, however, must use a current BOM and be lot tracked.

2   Enter a value for Days To Retain Import Documents, which is used by the Delete Tax Free Imports utility.

3   On the Product Codes form, in the Tax Free Days field, enter a default number of days items are considered tax-free for the specified product code. This value then defaults to the Tax Free Days field on the Items form.

Designate Items as Tax-Free

1 On the Items form, designate items as tax-free imported materials by selecting the Tax-Free Imported Material check box on the Items form.

2 In the Tax-Free Days field, specify a number or accept the default. Items that are tax-free imported materials must have a costing method of either FIFO or specific. You can also enter the Safety Stock Percent for this tax-free imported material.

Define Import Document IDs

1 Open the Tax-Free Imports form, and create import ID records as needed. Import documents are official documents prepared by the taxing authority and required for importing tax-free materials.

2 Enter additional details, such as country of origin, as appropriate to further define the Import Document ID.

3 (optional) Click the Items button to open the Tax Free Import Items form, where you can view the items associated with the currently selected Import Document ID.

Define Customer Export Types

1 Open the Customers form and select the Codes tab.

2 In the Export Type field, select the customer's export type. This indicates whether the customer can receive materials that are tax free. The type selected here defaults to any orders created for this customer.

Assign an Export Document ID to Finish Goods

1 Open the Tax-Free Imports form.

2 Assign an Export Document ID to finished goods containing tax-free imported materials shipped to a foreign customer for direct export, and local customers for indirect export in the shipping transaction. Finished goods can belong to Customer Orders, Transfer Orders, or Projects that have an Export Type of either Direct or Indirect.

Transfer Between Sites

When transferring a tax-free imported material between sites:

1 Open the Transfer Orders form.

2 Create a transfer order header, and select the appropriate Export Type.

3 For each line item added to the order, the Tax-Free Imported Material field must be selected on the Items form at both sites.

Create a Purchase Order

1   Open the Purchase Orders form.

2   When you create the order, select the Contains Tax-Free Material field.

3   When adding lines to the order, you may only select items that have been marked as tax-free imported materials on the Items form.

Remove Tax Free Status

1   Open the Quantity Move form.

2   Select the Remove Tax-Free Status field to remove an expired tax-free status for a specific material.

Enable Lot Tracking for Parent Items

1   Open the Tax-Free Imported Materials Process Utility form.

2   Specify an item and product code range, then click Process. The utility searches current Bills of Material (BOMs) to find parent items that contain tax-free imported materials. Lot tracking is then enabled for the parent items that contain tax-free imported materials. The utility starts searching at the material item level and ends at parent items.

Using the Engineering Board

The Engineering Board uses a graphical view to display a BOM. You can then build or modify that BOM on the form. To populate the form:

1   Launch the form in one of these ways:

- Standalone
- Click Engineering Board on one of these forms to load the associated BOM:
    - Items
    - Job Orders
    - Estimate Job Orders

2   If you launched the form standalone, click Open BOM to launch the Engineering Board - Open BOM modal form, where you can select the BOM to load.

3   The full BOM is displayed using cards for these parts of the BOM:

- Top Assembly
- Sub-Assemblies
- Operations
- Materials

4 Optionally, use the Find fields and button to locate an item type and number in the BOM. Use the Next/Previous buttons to go to the next or previous occurrence of that item number.

Copy and Paste

You can copy and paste operations and materials using the right-click menu on a card. To replace an existing operation or material, use the right-click menu on the existing card and select Paste. To add a new operation, on the desired Top Assembly or Sub-Assembly card, use the right-click menu and select Paste. To add a new material, on the desired operation card, use the right-click menu and select Paste.

Move an Operation or Material Card

Use drag-and-drop functionality to move a card from one place to another in the BOM. Click on the source operation or material and drag it to the target location.

Edit Information

To edit assembly, operation, or material information, on the desired card, right-click and select Details.

For Top Assembly and Sub-Assembly cards:

- When the BOM is for a current BOM, the Items form is launched.
- When the BOM is for a job, the Job Orders form is launched.
- When the BOM is for an estimate job, the Estimate Job Orders form is launched.

For Operation and Material cards:

- In the case of an operation, the corresponding operations form is opened.
- In the case of a material, the corresponding materials form is opened.

Perform the desired changes on the details form and close the form to return to the Engineering Board.

Delete an Operation or Material

To delete an operation or material, right-click on the desired card and select Delete. A confirmation message is displayed. The system checks whether the record can be deleted, and either deletes the record or informs the user the record cannot be deleted.

Resequence Materials Within an Operation

Select the operation or material where you want to resequence materials.

Select **Actions > Change Sequence** to launch the Change Material Sequence modal form.

After completing the resequence, close the form and return to the Engineering Board.

Counting Inventory

Differences Between Cycle Counts and Physical Inventories

There are two basic methods for counting inventory: *Cycle counts* and *physical inventories.* A cycle count and a physical inventory are similar, in that they both help you track your on-hand inventory. However, there are a few significant differences that you should be aware of when deciding which process to use. The following table summarizes the differences between these two methods:

A cycle count:	A physical inventory:
Does not require a warehouse inventory freeze.	Requires a warehouse inventory freeze.
Can be performed for individual items in inventory.	Requires that you do a count of all items in inventory.
Can be set up to be triggered in a variety of ways for a variety of reasons.	Can only be initiated in one way.
Allows other transactions to be conducted at the time the count is being performed.	Does not allow any other transactions to be conducted at the time the count is being performed.

About Cycle Counts

Cycle counting is a method for taking stock of what is in your inventory. Cycle counting is accomplished by taking periodic counts of what is actually in stockrooms.

NOTE: An alternate way to take stock is with a physical inventory. For a comparison of the differences between a cycle count and a physical inventory, see Differences Between Cycle Counts and Physical Inventories.

Periodic reconciliation of your inventory balances is important for the proper control of inventory levels. This control leads to improved customer service combined with an overall reduction of inventory.

Accurate counts:

- Help you know precisely how much is in stock.
- Give you a better ability to promise quantities to customers.

- Help prevent keeping too much in stock.

If you record all receipts and disbursements, the physical count should match the **On Hand** field on the Items form. If the physical count does not match the **On Hand** field on the **Items** form, a portion of your system needs to correct its procedures for tracking inventory. It is possible to establish cycle counting data to allow more frequent counting of important items. Variance reports quickly help spot large discrepancies.

Counts are taken at regular intervals. Different items can be counted at different intervals. For instance, you might want to keep a closer watch on the level A items, so it might be necessary to count them every two months. But it might only be necessary to count level C items every twelve months.

Cycle counting allows you to count a limited range of items at a time, instead of having to shut down the entire factory.

NOTE: During cycle counting, if the actual count in a specific location/lot is less than what the system has reserved in that location/lot, the system flags this as an exception and does not post. This occurs on the **Variance Report**.

Cycle counting takes place for the current warehouse. Cycle counting can take place at the same time for multiple warehouses.

Performing a Cycle Count

A cycle count is like a physical inventory, except that it is done only for a specific inventory item or group of items. Usually, inventory items are flagged for a cycle count when a specific action occurs that affects inventory quantities.

NOTE: For a comparison of the differences between cycle counts and physical inventories, see Differences Between Cycle Counts and Physical Inventories.

To define the selection criteria and create cycle count quantity records for a defined group of inventory items:

1 Define the cycle count setup.

- Open the Cycle Count Setup form.
- Enter the appropriate data in the required fields, specifying the cycle details and associated items.
- When finished, click Process.

2 Set up **Item/Warehouse** cycle counting fields.

For an item to be able to be cycle counted, specific information must be set up at the inventory level. To set up this cycle count information:

- Open the **Item/Warehouse** form.
- In the **Item** field, select the item for which you want to enter new cycle count information.
- In the **Warehouse** field, select the warehouse for which you want to enter new cycle count information.
- Click the filter-in-place button.

- Enter the appropriate information in the following fields:
  - **Cycle Type** - Select check boxes to define which inventory activities trigger a cycle count to occur.
  - **Cycle Freq** - Enter a numeric value representing the number of days between each cycle count. This field is required only if you selected **Day Frequency** as the **Cycle Type**.

  The system updates the following fields automatically:
  - **Count in Process** - When selected, this field signifies that the item is currently being counted for inventory purposes. If this check box is selected, the item's inventory is unavailable for change until the cycle count is complete.
  - **Cycle Trigger** - The system updates this field when the defined action in the **Cycle Type** field takes place. When a cycle count for this item is completed, the system clears this setting.
  - **Last Count** - The system updates this field automatically and displays the last date that a cycle count was performed for this item. If you want to change the date that the next cycle count is to be done, you can change this field manually.

3 Generate count sheets. To create the actual printed forms on which your staff is to record the counted quantities:

- Open the Cycle Count Generation form.
- Fill in the fields necessary to describe the properties of the count sheets.
- Click Process.

4 Distribute the count sheets and have your staff conduct the actual count of the designated items.

5 Collect the filled-in count sheets.

6 Record the cycle count quantities. To record the counted quantities from the count sheets into the system:

- Open the Cycle Count Update form.
- Filter to the appropriate item for which to generate the counted quantity.
- Enter the counted quantities for each item.
- If the item is lot-tracked, specify the lot.
- If the Item Stockroom Location and Item Lot Location do not exist, create them. The system prompts you for these values if they do not already exist.

7 Post the results of the cycle count.

To post the quantities to the **Quantity On-Hand** field for each inventory item and create entries to the journal for any adjustments:

NOTE: We recommend that you run the **Cycle Count Variance Report** before posting the cycle counts. This report provides an accounting audit trail for any variances encountered from the original quantities.

- On the Cycle Count Posting form, click Process.

- After posting is complete, review any records that have a status of Exception. These are records that did not post due to errors.
- (Optional) Use the Cycle Count Purge form to purge any records that were not posted.

For more information, see About Posting Cycle Count Quantities.

About Posting Cycle Count Quantities

After performing a cycle count, you must post the results of the count. The procedures for both the count and the posting are included in Doing a Cycle Count.

About Posting Counted Records

When you run the **Cycle Count Posting** activity, the system posts and deletes records that have the count quantity within the **Cycle Tolerance** cutoff quantity and which are not exceptions.

The **Cycle Count Posting** activity processes the cycle record using the following process:

1   The system checks to see if the actual count is different from the on-hand count already in the system.

- If the count is the same, there is nothing for the system to update, and it simply deletes the record.
- If the count is different, the system updates the location's on-hand quantity and the item's on-hand quantity.

2   The system creates a material transaction record with the following:

- Trans Type - B
- Ref Type - I
- Qty - the difference between actual (cycle) count and the computer-recorded count for the item.

3   The system posts the new quantity to the **Inventory Control Ledger Distribution** journal.

The **Cycle Count Adjustment Journal** reference **INV CC-A**; uses the following account numbers:

- Product Codes Inventory Adj account

   NOTE: If an account number is specified in the **Product Codes Cycle Inventory Adj** account field, the system uses that account instead.

- Item Location Inv Acct

4   Last, the system deletes the cycle count records and sets the **Last Count** field to today's date.

If no other cycle count records exist for this item, the **Cycle Triggered** and **Count in Process** options are cleared.

Exception Records

When it encounters an exception condition, the **Cycle Count Posting** activity changes the status of a record from **Counted** to **Exception**. The activity then proceeds to the next cycle count record.

Exception conditions include:

- The item is not in **Items**.
- The stockroom location is not found for the item.
- The reserved quantity is greater than the count quantity.
- The location on-hand quantity is not equal to the on-hand quantity when the cycle count record was generated.
- The reserved quantity is not equal to the on-hand quantity when the cycle count record was generated.
- The quantity counted exceeds the location on-hand quantity plus the **Product Code General** cycle tolerance.
- The lot number is invalid.
- The product code on the item is invalid.
- The serial number is invalid.
- The account is invalid.
- The unit code is invalid.
- The item denoted as tax-free does not have an Import Document ID.

If the activity encounters one of these conditions, the system changes the status from **Counted** to **Exception** and does not post the cycle record.

If the **Cycle Count Record** setting is changed to **Exception** because the current location's on-hand quantity is now different from the on-hand quantity when the count started or because the quantity counted exceeds the location on-hand quantity plus the **Product Code General** cycle tolerance, you can post the record using this activity. Make sure you change the **Cycle Status** field from **Counted** to **Exception**.

If the **Cycle Count Record** setting is changed to **Exception** for any other reason, you must correct the error condition in order to post the cycle count record. You can also delete the cycle count record from the cycle count.

About Physical Inventories

When beginning to use the system, you might want to run the **Rebalance Item Quantity On-Hand** utility to ensure that all inventory transactions are being processed correctly, because an actual count of all items in inventory is necessary. This count is reconciled with the item location book count.

If all receipts and disbursements are recorded properly, the physical count equals the book count. If not, some part of the system must correct its procedures for tracking inventory.

Variance reports are available to help you quickly spot the variances, so that corrective actions can be determined.

The physical inventory system helps take an actual count of the items on hand at each location by printing tags/sheets to record the on-hand count of each item in inventory. This count is then entered into the physical inventory system and later compared to the item location's on-hand quantity. After editing and approval, the actual counts are posted to the item location and to the **Items** record. This posting adjusts both the count and the value of the inventory.

The physical inventory function is done at the warehouse level. Physical inventory can take place at the same time for multiple warehouses.

NOTE: An alternate way to help keep track of inventory is the cycle count. For more information about the differences between cycle counts and physical inventories, see Differences Between Cycle Counts and Physical Inventories.

Doing a Physical Inventory

A physical inventory is the process of manually counting all inventory for a specific warehouse or location. Upon completion of the actual physical inventory, all numbers are then recorded, and discrepancies are identified and explained. This process provides a factual valuation of inventory.

NOTE: If you only need to do a partial inventory of selected items, or you cannot afford to have your entire system frozen while you perform inventory, you can do a *cycle count* instead. For a description of the differences between a cycle count and a physical inventory, see Differences Between Cycle Counts and Physical Inventories.

To perform a physical inventory, use the following procedures:

1   "Freeze" the inventory.

NOTE: Before a physical inventory can begin, the inventory status *must* be frozen. While performing the inventory, all inventory items for the selected warehouse are unavailable until the inventory is complete. Once you freeze inventory, you cannot unfreeze it until the physical inventory is complete for this warehouse.

To freeze the inventory:

a   On the **Freeze/Unfreeze Utility**, select a warehouse from the list.

b   Select the **Physical Inventory In Process** check box.

c   Click **Process**.

2   Set the control parameters for the inventory tags and/or sheets.For more information, see Set Tag/Sheet Controls.

3   Load the physical inventory records. For more information, see Load Physical Inventory Records.

4   Print inventory tags and/or sheets for your inventory staff to use. For more information, see Printing Inventory Tags and/or Printing Inventory Sheets.

5   Record the counted quantities into the system:

- From tags using the Input/Update Tags form.
- From sheets using the Input/Update Sheets form.

   a   Open the appropriate form.

   b   In the grid, enter the counted quantities for each item.

   c   If stock locations do not exist for inventory items, add them.

To enter a replacement tag/sheet number for an item/lot/location combination while the inventory is frozen, on the **Input/Update Tags** form or the **Input/Update Sheets** form, select **Actions > New**. You can also add a few records with blank sheet/tag numbers when needed without executing the printing process.

6   Post the inventory quantities. For more information, including the procedure and recommended pre-posting checks, see Posting Physical Inventory Quantities.

7   Unfreeze the inventory:

   a   Verify that the correct warehouse is selected on the **Freeze/Unfreeze Utility**.

   b   Clear the **Physical Inventory In Process** check box.

   c   Click **Process**.

Posting Physical Inventory Quantities

The physical inventory posting process posts the quantities of all physical inventory counts to the **Quantity On-Hand** field for each inventory item, as well as creating entries to the journal for any adjustments.

Before Posting Count Quantities

Before performing this activity, we recommend that you run the following reports/activities to generate an accounting audit trail for visibility for count discrepancies:

- The **Inventory Pre-Adjustment Report** provides a listing of entered quantities and highlights any discrepancy between the quantity on-hand and the physical inventory count.

- The **Physical Inventory Approval** changes the status of any physical inventory record, except those that have a status of **Uncounted**, to a status of **Approved**.

Records must be approved before they can be posted. Once approved, they can no longer be updated or voided.

Accept the default selection criteria on each report.

Running the Physical Inventory Count Posting

NOTE: The system does not allow you to post physical inventory records if the reserved quantity is greater than the physical count for that record. If this occurs, the system displays an error message during the posting process. You then have the option to continue with the physical inventory posting process or quit.

The records do not post until the reserved quantity is reduced either by the **Reserve/Unreserve Inventory Utility** or manually, using the **Reservations For Item** form or the **Reservations for Order** form.

1   Open the Physical Inventory Count Posting utility.

2   Verify that you have the correct Warehouse selected.

3   To update the quantity on hand and create journal entries for adjustments, click Process.

4   Upon completion, review any records that remain either on the Input/Update Tag or on the Input/Update Sheet form. These indicate records that did not post due to errors.

5   To purge any records that were not posted, open the Physical Inventory Records Purge form.

If only zero balance or invalid physical inventory records remain, you can use this alternative to purge inventory records.

NOTE: Remember to unfreeze the inventory after posting.

Managing Compliance

About Item Compliance Programs

Compliance programs allow you to track hazardous, or restricted, materials through the system. Using the Compliance Programs form, you can define specific programs and assign low-level items to them. Use the Item Compliance Assignment utility to determine whether a manufactured item's bill of material consists of compliant items.

Managing Item Compliance

To implement compliance tracking, you must create the compliance programs, assign items, then check bill of material compliance for your manufactured items.

Define a Compliance Program

6   Open the Compliance Programs form.

7   Select Actions > New.

8   Specify a name and description for the new program.

9   Save the record. The system updates all item records to show this program, and all items are marked as compliant. The grid on the Compliance Programs form populates with all item records, and indicates the compliance status, if it has been changed, and the date of the change.

Set Compliance for Each Low-level Item

To modify the compliance for any item that does not have a bill of material:

1   Open the **Items** form.

2   Select the item record.

3   On the **Compliance** tab, locate the compliance program that you want to modify.

4   Select, or deselect, the Compliant checkbox to alter the item's status.

5   Save the item record. The **Compliance Programs** form will reflect the change you just made, note that it was changed, and specify the date of the change.

Determine Compliance for Manufactured Items

1 Open the Item Compliance Assignment Utility form.

2 Specify which compliance programs you want to process.

3 Specify whether you want to process all items, or only the items whose status has changed recently.

4 Click Process. The Compliance Programs and Items forms will reflect any compliance status changes made by this utility.

About Export Compliance

There are six fields on the Trade Compliance tab of the Items form that support export compliance for items that fall under the International Traffic In Arms Regulations (ITAR). Of the six fields, only the Country of Origin has any validation. The other fields are simply for user entry. Data from these fields is exported through the Item Master BOD.

Costing Items

Costing Overview

Companies design costing methods to support three processes:

- Planning
- Control
- Decision making

The system supports you in developing, using, and optimizing costing conventions appropriate for your particular business and product lines.

CAUTION: The decisions that you make in setting up your costing methods affect calculations throughout Inventory, Material Planning, Production, and Financials. We strongly recommend you set up your costing methods before processing any manufacturing transactions.

Because the system costing methods are set at the item level, you can use a variety of combinations of cost flow methods in order to manage different items in different ways. For example, you could use:

- Average costing for purchased items and LIFO for manufactured items
- Standard costing for inventory valuation and financial reporting, and FIFO for job costing.
- Standard costing as the system default, but use Average costing for purchased items.
- Specific costing for expensive items or items whose price fluctuates, but Standard for small items like nuts and bolts which contribute little to the total cost of the product.

Setting Up Costing

We strongly recommend you decide on a coherent, overall costing strategy for your company before implementing any of the costing functionality in the system.

Be sure you understand the implications of the cost type and cost method you have chosen before you implement the manufacturing functions. After your strategy is complete, you can set up the system to handle the associated calculations and controls and provide the appropriate cost reports. You implement your strategy by indicating your decisions on the following fields, which control the way the system maintains, processes, and applies costs throughout the system:

Form	Field
Inventory Parameters	Cost Type
	Cost Item at Warehouse
General Parameters	Post to Journals
Purchasing Parameters	Update Current Cost
Shop Floor Control Parameters	Calculate Variances Against
	Overhead Basis (Material, Labor, Machine)
	Cost Based on Complete (Operations, Jobs)
Items	Cost Type
	Cost Method

1 Open the Inventory Parameters form and select a cost type in the **Cost Type** field. The cost type you select at this level will be the default value in the Cost Type field when you add new item records. On the **Items** form - General tab, you can overwrite the Cost Type on an item by item basis. Valid options are:

Standard Costing:

- All inventory reports use the standard cost of each item.
- All transactions processed that affect inventory value are posted to the inventory distribution journal at standard cost (variances are also posted).

- You can still use one of the four actual cost methods (average, LIFO, FIFO, or specific) for job costing, even though you are using standard costing for your journals/ledger.
- Variance calculation will depend on the setting of the Calculate Variances Against field located on the **Shop Floor Control Parameters** form. For standard costing, this field should be set to Standard.

Actual Costing:

- All inventory transactions are posted to the inventory distribution journal based on the cost method you enter for each item on the **Items** form.
- The cost used for inventory reports, job costing, and posting to the inventory ledger distribution journal is determined by the costing method specified in **Items** for each item.
- Variance calculation will depend on the setting of the Calculate Variances Against field located in **Shop Floor Control Parameters**. For actual costing, this field should be set to Actual.

2   Select the Cost item at Warehouse field if you want to track the cost of items at the item/warehouse level instead of the item level. Leave this field blank to continue to track costs at the item level.

CAUTION: Once you select this field and save the record, it cannot be deselected.

3   Open the General Parameters form and select the **Post to Journal** check box if you want the system to post to the Ledger Distribution Journals transactions for all production and material transactions. Clear this check box if you do not want the system to perform the posting.

4   Open the Purchasing Parameters form and select a value in the **Update Current Cost** field. This field tells the system how to use the Current Unit Cost field in **Items** for purchased items. Regardless of which costing method is in use, it is possible to use the Current Unit Cost field to maintain the current cost of purchased parts. The value of this field has no affect on the flow of costs through the system. It is accessed only by the purchase order receiving function in Purchasing to determine whether it is possible to update the Current Unit Cost field in **Items** with the purchase price of the item. The valid values for this field are:

- **Average** - The system maintains the average purchase cost for purchased items in the Current Unit Cost field. When an item is received into stock by way of the purchase order receiving function, The system calculates a new average cost for the item and posts the result back to the Current Unit Cost field.
- **Last** - The system maintains the last price paid for purchased items in the Current Unit Cost field. When an item is received into stock through the Purchasing module, the purchase order unit cost is posted to the Current Unit Cost field.
- **None** - prevents Purchasing from updating the Current Unit Cost field when items are received.

5   Specify information on the Shop Floor Control Parameters form:

- Jobs Tab - Calculate Variances Against - Select Actual or Standard.
- Transactions Tab - Overhead Basis determines whether the overhead costs applied to jobs are based on material cost, labor hours, both, or neither. Enter the Overhead Applied Basis. If you leave this field blank, the system will not calculate overhead. Valid entries are:

- o **Labor** - the Fix Ovhd Rate and Var Ovhd Rate fields on the **Departments** form are used in the calculation of labor overhead.
- o **Material** - the Fixed Matl Ovhd Rate and Variable Matl Ovhd Rate tabs on the **Product Codes** form are used in the calculation of material overhead. The overhead updates the WIP when you issue the material to the job.
- o **Machine** - the Fix Mach Ovhd Rate and Var Mach Ovhd Rate fields on the **Work Centers** form-Costing tab are used in the calculation of machine overhead.
- **Transactions Tab - Costs Based on Complete** determines how costs are calculated for items moved to stock from non-completed jobs. Valid entries are:
  - o **Operations** - actual costs are used for those operations that are complete; planned costs are used for those that are incomplete.
  - o **Jobs** - planned costs are used for all operations.

6   Specify information on the Items form:

- **Cost Type -** displays the cost type you entered as a default on the General Parameters form. If you want to overwrite the default for the current item only, select Actual costing or Standard costing. When you change the Cost Type, the system converts the internal information to match the new type for the item. This may generate ledger transactions.
- **Cost Method -** maintains the cost flow method used for tracking and posting Cost Ledger transactions for the item. When you change the cost method, the system will convert the internal information to match the new method for the item. This may generate ledger transactions.

NOTE: When determining the values it should use for posting to the journals/ledger, the system first looks at the Cost Type in **Items**. If the Cost Type is Standard, the system will post the standard unit costs for all items to the journals/ledger. But if the Cost Type is Actual, the system will look at the Cost Method to determine the values it should post to the journals/ledger.

The cost flow methods available for valuing inventory if your Cost Type is set to Actual are:

Cost Type	Cost Method
Actual	Average
Actual	LIFO
Actual	FIFO
Actual	Specific

The cost flow methods available for valuing inventory if your Cost Type is set to Standard are:

Cost Type	Cost Method
Standard	Average

Standard	LIFO
Standard	FIFO
Standard	Specific
Standard	Standard

Average Costing Setup

Follow these steps to implement Average costing in the system:

1 Select the Post to Journal check box on the **General Parameters** form to have all transactions which affect inventory post to the G/L Inventory Distribution Journal. Clear the check box to suppress posting to the G/L those transactions which may affect inventory.

2 Set the Cost Method field on the **Items** form - General tab to Average for all items. (Ideally, you will set this field at the time the items are added to the **Items** form).

3 Set the Cost Type field on the **Items** form - General Tab to Actual. The cost type defaults from the Cost Type field on the **General Parameters** form when adding new items.

4 Enter the initial cost of each item into the Unit Cost field on the **Item Costs** form.

5 You can maintain cost details for both unit cost and Current unit cost entities. When the beginning inventory balance is entered through the stock adjust transaction, the quantity entered is valued at the cost entered. If an item has no beginning inventory balance, zero may be left in the Unit Cost field for the system to update as the item is received into stock.

6 If you have instructed the system to post inventory transactions to the G/L by selecting the Post to Journal check box on the **General Parameters** form, you must also set up the G/L account numbers which the system uses for this interface.

The following account numbers need to be entered into the associated codes and parameters for costing purposes:

Product Codes - WIP Tab

Material

Labor

Fovhd

Vovhd

Outside

Product Codes - Misc Tab

Only one account is needed for:

Inventory Adjustment

Product Codes - Applied Overhead Tab

Only one account is needed for each of the following:

Matl Fovhd Applied

Matl Vovhd Applied

NOTE: The Matl Fovhd Applied and the Matl Vovhd Applied accounts are required only when overhead is based on job material issues.

Departments

Fixed Ovhd Applied Acct

Var Ovhd Applied Acct

Direct Labor Applied Acct

Work Centers - Costing Tab

Fix Mach Ovhd Applied Acct

Var Mach Ovhd Applied Acct

Distribution Accounts - Inventory Tab

Inventory

Inventory Labor

Inventory Fovhd

Inventory Vovhd

Inventory Outside

Distribution Accounts - Sales/COGS Tab

COGS Matl

COGS Labor

COGS Fovhd

COGS Vovhd

COGS Outside

Distribution Accounts - In-Transit Tab

In-Transit Material

In-Transit Labor

In-Transit Fovhd

In-Transit Vovhead

In-Transit Outside

LIFO and FIFO Costing Setup

Follow these steps to implement either LIFO or FIFO inventory cost method:

1   Select the Post to Journal check box on the **General Parameters** form to have all transactions which affect inventory post to the G/L inventory distribution journal. Clear the check box to suppress posting to the G/L those transactions which may affect inventory.

2   Set the Cost Method field on the **Items** - General tab to LIFO or FIFO for all items. (Ideally, you will set this field at the time the items are added to the Items file).

3   Set the Cost Type field on the **Items** - General tab to Actual. The cost type default value comes from the Cost Type field on the **Inventory Parameters** form when adding new items.

4   Enter the initial cost for the item into the Unit Cost field in the **Items** form at the time the item is added to the file.

NOTE: When the beginning inventory balance is entered by way of a stock adjust transaction, a record is created in the Item LIFO file with the current date, time, quantity, and the cost that is entered. If an item has no beginning inventory balance, leave a zero in each of the Unit Cost Detail fields and a LIFO/FIFO stack will be created as the item is received into inventory.

If you have entered Actual in the parameter default Cost Type field, and selected the Post to Journal check box to indicate that the manufacturing modules are to post inventory transactions to G/L, you must also set up the G/L account numbers that the system uses for this interface. Listings of the account numbers and related codes and parameters which need to be entered for costing purposes follow.

Product Codes - WIP Tab

> WIP Material
>
> WIP Labor
>
> WIP Fixed Overhead
>
> WIP Var. Overhead
>
> WIP Outside Services

Product Codes - Miscellaneous Tab

> Inventory Adjustment

Product Codes - Applied Overhead Tab

> Matl Fovhd Applied
>
> Matl VOvhd Applied
>
> **NOTE:** The Fixed Material Overhead Applied and the Variable Material Overhead Applied accounts are required only when overhead is based on job material issues.

Departments

> Fixed Ovhd Applied Acct
>
> Variable Ovhd Applied Acct
>
> Direct Labor Applied Acct

Work Centers - Costing Tab

    Fix Mach Ovhd Applied Acct

    Var Mach Ovh Applied Acct

Distribution Accounts - Inventory Tab

    Inventory Material

    Inventory Labor

    Inventory Fovhd

    Inventory Vovhd

    Inventory Outside

Distribution Accounts - Sales/COGS Tab

    COGS Material

    COGS Labor

    COGS Fovhd

    COGS Vovhd

    COGS Outside

Distribution Accounts - In-Transit

    In-Transit Material

    In-Transit Labor

    In-Transit Fovhd

    In-Transit Vovhd

    In-Transit Outside

NOTE: You are allowed to delete any distribution account record, including the default distribution account with a blank warehouse and blank Product Code.

Specific Costing Setup

Follow these steps to implement the Specific inventory cost method:

1   Select the Post to Journal field on the **Inventory Parameters** form to have all transactions which affect inventory post to the G/L inventory distribution journals. Clear the field to suppress posting to the G/L those transactions which may affect inventory.

2   Set the Cost Method field on the **Items** - General tab to Specific for all items. (Ideally, you will set this field at the time the items are added to the Items file).

3   Set the Cost Type field on the Items - General tab to Actual. The cost type default value comes from the Cost Type field on the Inventory Parameters form when adding new items.

4   Enter the beginning inventory, along with the initial Specific unit cost, for each item's location/lot.

NOTE: When processing an ADD transaction on the **Item Stockroom Location** form to enter stock locations and accompanying beginning inventory balances, enter the cost to be associated with the item's quantity entered. This cost is also posted to the Unit Cost field in the Items file.

If you have selected Actual in the Inventory Parameter's Cost Type field, and selected the Post to Journal check box in General Parameters to indicate that the manufacturing modules are to post inventory transactions to G/L Inventory Distribution Journals, you must also set up the G/L account numbers that the system uses for this interface. The following account numbers need to be entered into the associated codes and parameters for costing purposes:

Product Codes - WIP Tab

> WIP Material
>
> WIP Labor
>
> WIP Fixed Overhead
>
> WIP Variable Overhead
>
> WIP Outside Services

Product Codes - Misc Tab

> Inventory Adjustment

Product Codes - Applied Overhead

> Only one account is needed for the each following:
>
> Matl Fovhd Applied
>
> Matl Vvhd Applied
>
> **NOTE:** The Fixed Material Overhead Applied and the Variable Material Overhead Applied accounts are required only when overhead is based on Job Material Issues.

Purchasing Parameters

> Vouchers Payable

Standard Costing Setup

To implement *standard* costing in the system, use the following procedure:

1   Open the Inventory Parameters form.

2   In the **Cost Type** check box, select **Standard**.

> This selection indicates that all inventory reports and transaction posting to the G/L are to use the item's *standard* cost.
>
> This field is also maintained on the Items form, the **Cost Type** field of which defaults from the **Cost Type** field of the **Inventory Parameters** form when adding new items.

3   On the **Items** form, **General** tab for all items, select the **Cost Method**.

> For standard costing, the system uses the **Cost Method** field on the **Items** form only to determine what material cost to post to a job to which the item is issued.

4 Open the Shop Floor Control Parameters form.

5 On the **Jobs** tab, in the **Calculate Variances Against** group box, select **Standard**.

6 Determine the standard cost of each item.

Because the **Standard Unit Cost** field cannot be updated, the standard cost must be established in a different way.

- For purchased parts: On the Item Costs form, the **Cost Maint** tab, **Purchased Current Unit Cost** group box, enter the standard cost into the **Material** field.

  The **Roll Current Unit Cost to Standard Cost** utility rolls the purchased current cost to the standard cost when you save the form.

- For manufactured parts: On the Item Costs form, the **Cost Maint** tab, **Manufactured Current Unit Cost** group box, enter the standard cost into the **Material Cost** field.

  The **Roll Current Unit Cost to Standard Cost** utility rolls the purchased current cost to the standard cost when you save the form.

7 After establishing all routings and bills of material that are to be standard for manufactured items, post the current cost of the manufactured item to the **Manufactured Current Unit Cost** field by running the **Current BOM Cost Roll Up** utility. You can then roll this field to the **Standard Unit Cost** using the **Roll Current Unit Cost to Standard Cost** utility. Performing this utility also copies the current routing and materials to the standard routing and materials.

8 Enter the required General Ledger account numbers in Product Code, Parameter Defaults, Department, and Distribution Accounts files. These account numbers are used for the posting of inventory transactions to the G/L inventory distribution journal.

The account numbers to enter for costing purposes in the various codes and parameters are as follows:

Product Codes - WIP Tab

WIP Material

WIP Labor

WIP Fixed Overhead

WIP Variable Overhead

WIP Outside Services

Standard Bill Of Material Costing

Efficiency Factor = WC efficiency/100

Setup Cost/Unit = (total setup hrs * OPERATIONS setup rate /lotsize) / efficiency factor

Run Cost/Unit = (per unit run hrs * OPERATIONS run rate / efficiency factor

Material Cost = QTY per parent * Std BOM Unit Cost / (1.00 - Scrap %)

Labor Fixed or Variable Overhead = OPERATIONS [Fix Var] OH Rate * [(Total Setup Hrs/Lot Size) + Run Hrs Per Piece]/Efficiency Factor

Material Fixed or Variable Overhead = MATERIALS [Fix Var] OH Rate * [(QTY Per Parent * Std BOM Unit Cost]/1.00-Scrap %

Machine Fixed or Variable Overhead = OPERATIONS [Fix Var] OH Rate [Run Hrs Per Piece]/Efficiency

Fixed Overhead = Labor Fixed Overhead + Material Fixed Overhead + Machine Fixed Overhead

Variable Overhead = Labor Variable Overhead + Material Variable Overhead + Machine Variable Overhead

Product Codes - Ovhd Var Tab

Only one account is needed for each of the following:

Fixed Material Overhead Applied

Variable Material Overhead Applied

Fixed Labor Ovhd Usage

Variable Labor Overhead Usage

Fixed Material Overhead Usage

Variable Material Overhead Usage

Fixed Machine Overhead Usage

Variable Machine Overhead Usage

NOTE: The Fixed Material Overhead Applied and the Variable Material Overhead Applied accounts are required only when basing overhead on job material issues.

Product Codes - Misc Tab

Cost Budget

Product Code - Variance

Purchase Cost

Material Usage

Labor Rate

Labor Usage

Routing

Department

Fixed Overhead Applied Account

Variable Overhead Applied Account

Direct Labor Applied Account

Work Center - Costing

Fix Mach Ovhd Applied Account

Var Mach Ovh Applied Account

Distribution Accounts - Sales/Cost of Goods Sold

COGS Material

COGS Labor

COGS Fovhd

COGS Vovhd

COGS Outside Services

After the completion of these steps, you are ready to start processing manufacturing transactions.

Posting Costs

About Posting - Summary

Posting Costs at Receipt

If the receipt is from Purchasing, the cost used for these postings is the purchase order unit cost. If the receipt is from Production, the cost used depends on whether the job was automatically closed when posting the transaction. If it was automatically closed, the cost used is the actual unit cost from the job. If the job is left open, the system uses the planned cost of the job and makes an inventory adjustment when the job is closed.

Cost Method	Receipt Cost Posted
Average	Weighted average calculation with the result posted back to the Unit Cost field.
LIFO or FIFO	The record is created in the Item LIFO file, recording the date, time, quantity, and cost of the receipt.
Specific	Cost tied directly to the location/lot to which the item was posted. If it was posted to a location/lot that already had a quantity and cost, the new cost is tied to the location and an Adjustment transaction is posted to the Inventory Ledger Distribution Journal. The cost is also posted to the Unit Cost field.
Standard	Standard unit cost is not changed.

Posting Costs at Issue

Cost Method	Issue Cost Posted
Average	Uses the value in the (Standard) Unit Cost field in the Item Costs form.
LIFO	Starting with the newest Item LIFO record, the system processes these records until the entire quantity is issued, using the cost tied to each of the Item LIFO records it uses.
FIFO	Starting with the oldest Item LIFO record, the system processes these records until

	the entire quantity is issued, using the cost tied to each of the Item LIFO records it uses.
Specific	Uses the cost tied to the location/lot from which the item is issued.
Standard	Issues the item at Standard cost.

About Posting - Average Cost Method

Posting of Costs At Receipt for Average Cost Items

The following transactions increase inventory on-hand quantities:

- Purchase order receiving
- Job receipt
- Job transactions posting
- Job material withdrawal
- Customer order return
- Stock adjustment
- Cycle count posting
- Miscellaneous receipt
- Physical inventory posting

An increase in inventory due to a purchase order receipt, job transaction, or miscellaneous inventory receipt is associated with a new calculation of the Average cost, which in turn is posted to the (Standard) Unit Cost field on the Items form.

An increase in inventory due to a customer order return, a stock adjustment, through cycle count posting, physical inventory posting, or from a job material withdrawal does not affect the value in the Unit Cost field.

The new Average cost calculation is:

AC = (OQOH * OAC) + (RQ * RC) / (OQOH + RQ)

where:

- AC = Average cost
- OQOH = old quantity on-hand
- OAC = old Average cost
- RQ = receipt quantity
- RC = Receipt cost

The Receipt cost (RC) in the calculation varies, depending upon the type of transaction being processed:

- When an item is received through the purchase order receiving function, the receipt cost default value comes from the **Purchase Order Lines** form's Unit Cost field.

- When a miscellaneous receipt is performed, you enter the receipt cost at the time the transaction is processed.

- When inventory is received from a job, the receipt cost is determined by the **Shop Floor Control Parameters** form's Costs Based on Complete field, the status of the job, and the Complete flag on the job's operations. If the receipt is being performed using a labor transaction on the last operation, you have the option of closing the job order. If the job is closed when the transaction is entered, the receipt cost used is always the Actual unit cost of the job.

- If the job is not closed and the Costs Based on Complete parameter is set to "Jobs," the receipt cost used is the Planned unit cost of the job. (The Planned unit cost is based on the setup, run times, and the rates from the **Current Operations** and **Current Materials** forms.)

- If the job is not closed, and the Costs Based on Complete parameter is set to "Operations," the receipt cost used is determined by the "Complete" flag of the job's operations.

- Actual costs from completed operations are accumulated while planned costs from incomplete operations are accumulated to determine the final receipt cost.

Posting of Costs At Issue for Average Cost Items

The following transactions decrease inventory on-hand quantities:

- Job material issue
- Customer order shipment
- Purchase order return
- Stock adjustment
- Cycle count posting
- Physical inventory posting

All issues out of stock are done at the item's Average cost at the time of the transaction, including the posting to the G/L Journal.

All of the Inventory reports that use cost information use the item's Average unit cost at the time the report is executed. The reports using cost information include:

- Item Cost By Product Code Report
- Item Costing Report
- Indented Costed Bill of Material Report

About Posting - LIFO and FIFO Cost Methods

Posting of Costs At Receipt for LIFO and FIFO Cost Items

The system processes that receive an item into inventory are the following:

- Purchase order receiving
- Job receipt
- Job transactions posting
- Job material withdrawal
- Customer order return
- Stock adjustment
- Cycle count posting
- Miscellaneous receipt
- Physical inventory posting

Item LIFO File

For LIFO and FIFO costing, the system maintains a stack of all of the receipts for an item in the Item LIFO file.

Each time an item is received into stock from a purchase, job, or miscellaneous receipt, an Item LIFO record is created that contains the following information:

- Item number
- Receipt date
- Receipt time
- Quantity received
- Receipt cost (cost details for manufactured items - material cost, labor cost, fixed overhead cost, variable overhead cost, and outside cost)
- G/L account number

If LIFO is used, the receipt cost is posted to the Item Costs form and displayed (view only) in the Items form's (Standard) Unit Cost field. The Unit Cost field displays the next cost at which to issue the item.

If FIFO is used, the receipt cost is posted to the **Item Costs** form and displayed (view only) in the **Items** form's (Standard) Unit Cost field. The Unit Cost field displays the cost of the oldest Item LIFO record on file for the item.

Each time an item is received into stock from a customer order return, a stock adjustment, through cycle count posting, physical inventory posting, or from a material withdrawal, the quantity received is added to the quantity currently in the last record of the Item LIFO file.

NOTE: The current LIFO/FIFO information on file for each item displays on the **Item LIFO/FIFO Summary** and **Item LIFO/FIFO Detail** reports.

The Receipt Cost posted to the Item LIFO record varies depending on the transaction being posted:

- For the purchase order receiving transaction, as a default the receipt cost posted is the **Purchase Order Lines** unit cost.

- When an item is received through **Purchase Order Receiving**, the Receipt Cost default value comes from the **Purchase Order Lines** unit cost.

- When a **Miscellaneous Receipt** is performed, the Receipt Cost used is entered by a user at the time the transaction is processed.

- When inventory is received from a job, the Receipt Cost used is determined by the **Shop Floor Control Parameters** form's Costs Based on Complete field, the status of the job and the Complete flag on the job's operations. If the receipt is being performed using a labor transaction on the last operation, you have the option of closing the job order. If the job is closed when the transaction is entered, the receipt cost used is always the actual unit cost of the job.

- If the job is not closed and the Costs Based on Complete parameter is set to "Jobs", the Receipt Cost used is the Planned unit cost of the job. (The Planned unit cost is based on the setup, run times, and the rates from the **Current Operations** and **Current Materials** forms.)

- If the job is not closed and the Costs Based on Complete parameter is set to "Operations," the Receipt Cost used is determined by the "Complete" flag of the job's operations.

- Actual costs from completed operations are accumulated while planned costs from incomplete operations are accumulated to determine the final receipt cost.

Ledger Distribution Journals

When an item goes into stock (purchased or manufactured), a new transaction is created in the appropriate Ledger Distribution journal (CO Dist, IC Dist, PO Dist or SF Dist).

- The Receipt Cost used for a PO receiving, job receiving, or miscellaneous receiving transaction is the Receipt Cost described above.

- The Receipt Cost used for a stock adjustment is the last record in the Item LIFO file at the time the transaction is entered. The Receipt Cost used for a customer order return is the average for all shipments against the line item.

- The Receipt Cost used for a job material withdrawal is an average of the actual cost at which the item was issued to the job.

Posting of Costs At Issue for LIFO and FIFO Cost Items

Items are issued out of inventory in the system by processing the following transactions:

- Job material issue
- Customer order shipment
- Purchase order return
- Stock adjustment
- Miscellaneous issue
- Cycle count posting
- Physical inventory posting

The **Item Costs** and **Items** forms' (Standard) Unit Cost fields are not accessed when an item is issued from inventory. When an item is issued, the system consumes the quantities and costs in the Item LIFO file for the item until the entire quantity is issued.

Although the **Item Costs** and **Items** forms' (Standard) Unit Cost fields display the next cost at which an item is issued, it is possible that several different unit costs are used to arrive at the total issue cost if more than one Item LIFO record needs to be consumed to satisfy the quantity being issued. As the quantities and costs are consumed, the records are deleted from the Item LIFO file. When LIFO or FIFO costing is used, the system does not care from what stock location the items are being issued. It is only concerned with the timing of the receipts.

About Posting - Standard Cost Method

Posting of Costs at Receipt for Standard Cost Items

The system processes that receive an item into inventory are the following:

- Purchase order receiving
- Job receipt
- Job transaction posting
- Job material withdrawal
- Customer order return
- Stock adjustment
- Miscellaneous receipt
- Cycle count posting
- Physical Inventory Posting

NOTE: The Standard Unit Cost field is never updated automatically by the system. All quantities go into the Inventory module at the Standard cost of the item.

If the receipt is from purchasing, the Current Unit Cost field is updated if the **Purchasing Parameters** form's Update Current Cost field is "Average" or "Last."

Inventory Ledger Distribution Journal

The value of inventory is increased no matter which of the above functions is executed. A transaction is posted to the Inventory Ledger Distribution Journal when one of these functions is executed.

The transaction increases the appropriate inventory account using the item's Standard cost. Any variance from Standard cost posts to one of the variance accounts in the **Product Codes** form.

If you use Standard costing system-wide, but have entered Average, LIFO, FIFO, or Specific costing at the Items level for the item, the system creates or maintains the appropriate information needed for whichever cost method is being used.

This cost information is used only for job costing.

Posting of Costs at Issue for Standard Cost Items

The system processes that issue an item out of inventory are:

- Job material issue
- Customer order shipment
- Purchase order return
- Stock adjustment
- Miscellaneous issue
- Cycle count posting
- Physical Inventory Posting

The cost at which a material is issued to a job depends upon the cost method you enter on the **Items** form:

- If you select "Standard" in the Cost Method field, the job material cost is always posted using the item's Standard unit cost.
- If you enter any other cost method, the actual material cost charged to the job is the LIFO, FIFO, Specific, or Average cost maintained for the item.

Customer order shipments, purchase order returns, and stock adjustments are always processed at the item's Standard cost.

Inventory Ledger Distribution Journal

No matter which **Items** cost method is used, the transaction posted to the Inventory Ledger Distribution Journal uses the item's Standard cost. The only variance posted from any of the inventory reducing functions occurs when an item is issued to a job and the quantity issued is more or less than the standard quantity of the material required for that job.

Reports

All of the following reports use the Standard unit cost of the item, regardless of the value in the **Items** form's Cost Method field:

- Item Cost By Product Code Report
- Item Costing Report
- Indented Costed Bill Of Material Report

About Costing Types

About Standard Costing

Standard costing assigns a Standard cost for each item in Items. In contrast to the four Actual cost methods, the Standard cost of an item will not change unless you either change it manually or run the Roll Current Cost to Standard Cost utility.

When you have set the parameters and field values to establish Standard costing, each system function that uses the unit cost of an item uses the Standard unit cost. These functions include:

- all inventory reports
- issue of materials to jobs
- transaction posting to the Inventory Ledger Distribution Journal

You can post material costs to jobs using one of the four Actual costing methods by overwriting the Standard Cost Type default at the Item level.

CAUTION: You must use Standard costing when you employ the Repetitive method of manufacturing.

About the Average Costing Method

Average is a cost method which uses a weighted average of the costs of all items and maintains one actual, average unit cost for an item at all times. Unlike the other Actual cost flow methods, which store cost information in a separate file, the Average cost for an item is maintained on the **Item Costs** form, in the Unit Cost Detail fields. The unit cost also appears on the Items form.

The system maintains the cost of inventory as follows:

- When you receive a quantity via a purchase order, job completion, or miscellaneous receipt, the system computes the new average unit cost. This updated average unit cost is then posted to the Unit Cost field on the **Items** form.
- When you receive a quantity via a customer order return, stock adjustment, cycle count posting, or job material withdrawal, that quantity does not affect the Average unit cost.
- When you issue a quantity to a job or ship a quantity to a customer, the system reduces the associated inventory account by the Unit Cost * Qty Issued or Shipped.

The system calculates the new Average unit cost for each cost details component as follows:

(OQOH * OAUC) + (QR * RC) / OQOH + QR = NAUC

where:

NAUC = new average unit cost
OQOH = old quantity on-hand
OAUC = old average unit cost
QR = quantity received
RC = receipt cost

About the FIFO Costing Method

FIFO (First In, First Out) is a cost method which always issues items out of inventory at the oldest (or last) cost at which the item was received.

The FIFO option uses the first-in, first-out cost flow method. The system maintains a stack of multiple unit costs and quantities (in order by date and time) for each item location inventory account.

The system maintains a stack of receipts to stock for each item and consumes quantities in the stack when an item is issued out of stock. This consumption is done from the newest to oldest cost if LIFO is being used, and from the oldest to the newest if FIFO is being used. Each receipt to stock includes unit cost details and quantities (in order by date and time) for each Item Location Inventory account.

The system adds to and subtracts from this stack as follows:

- When you receive a quantity into stock from a purchase receiving transaction, or job completion, the system adds a new quantity and cost to the bottom of the stack. The system records both the date and time of the transaction (for tie-breaking).

- When you issue a quantity to a job, or ship a quantity to a customer, the system uses the earliest costs and reduces the stack by the value of the items issued or shipped.

The Unit Cost field on the Items form shows the next cost at which to issue the item. When you use FIFO, the system posts the oldest receipt cost to the Unit Cost field on the **Items** form each time you process a new receipt.

About the LIFO Costing Method

LIFO (Last In, First Out) is a cost method which always issues items out of inventory at the newest (or last) cost at which the item was received.

The system maintains a stack of receipts to stock for each item and consumes quantities in the stack when an item is issued out of stock. This consumption is done from the newest to oldest cost if LIFO is being used, and from the oldest to the newest if FIFO is being used. Each receipt to stock includes unit cost details and quantities (in order by date and time) for each Item Location Inventory account.

The system adds to and subtracts from this stack as follows:

- When you receive a quantity into stock from a purchase receiving transaction, job completion, or miscellaneous receipt, the system adds the receipt quantity and cost to the bottom of the stack.

- When you receive a quantity into stock from a customer order return, stock adjustment, cycle count posting, or material withdrawal, the system adds the quantity received to the current quantity in the last record of the LIFO file.

- When you issue a quantity to a job or ship a quantity to a customer, the system uses the latest (last-in) costs and reduces the stack by the value of the items issued/shipped.

The Unit Cost field on the Items form shows the next cost at which to issue the item. When you use LIFO, the system posts the receipt cost to the Unit Cost field on the **Items** form each time you process a new receipt.

About Purchase Overhead Costs

For products that include items with a purchase source, you can include the cost of purchasing those items as a purchase overhead cost. This is done using product codes that include a component for purchase overhead costs.

When purchase overhead has been defined for a product code, then for any item that uses that product code, purchase overhead cost is included in material transactions and journal entries created during the purchase order receiving process. Other receiving processes, such as transfer orders or miscellaneous receipts, do not record purchase overhead costs.

Purchase overhead costs are defined on the **Product Codes** form, the **Purchased Overhead** tab.

NOTE: The following examples use only one item for purchasing. In a "real-world" situation, there would likely be more.

Example: Standard Cost Type

Company A has a product for which they purchase parts to use in production. They incur a 20% purchase overhead cost per unit. The Purchase Current Unit Cost for each product unit is set as:

- Material - $10.00
- Freight - $2.00
- Purchase overhead - $2.00

At standard cost, this would translate to a total cost of $14.00 for each product unit.

With a standard cost applied at purchase time, however, the Material costs only $9.10, and the Freight cost is reduced to $1.10, resulting in a Material Cost of only $10.20. When the purchase overhead cost is calculated in at 20% of the material overrun, it amounts to only $0.01, and is included as part of the Fixed Overhead costs for Standard Unit Costs. This results in a total Unit Cost of $10.21.

The journal entry for this transaction might appear something like this:

		Debit	Credit
Inventory Material	12700	10.20	-
Inventory Fixed Overhead	12704	0.01	-
Vouchers Payable	20150	-	10.00
Purchase Price Variance	51400	0.90	-
Purchase Overhead Applied	58250	-	2.00
Purchase Overhead Variance	51480	1.99	-

		Debit	Credit
Freight Payable	20152	-	2.00
Freight Variance	51460	0.90	-
			0.00

Example: Actual Cost Type

Company B also has a product for which they purchase parts to use in production. They also incur a 20% purchase overhead cost per unit, and the Purchase Current Unit Cost for each product unit is set the same as for Company A.

This means that the unit Material Cost for each product unit remains at $12.00 (for material and freight), and the Fixed Overhead at $2.00 (for purchase overhead cost). This results in a total of $14.00 for each product unit, regardless of current costs in the marketplace.

The journal entry for this transaction might appear something like this:

		Debit	Credit
Inventory Material	12700	12.00	-
Inventory Fixed Overhead	12704	2.00	-
Vouchers Payable	20150	-	10.00
Purchase Overhead Applied	58250	-	2.00
Freight Payable	20152	-	2.00

About the Specific Costing Method

Specific is a cost flow method that ties the item's cost directly to the location/lot combination where the item received is posted. An item is issued from inventory at the cost tied to the specific location/lot combination.

Because each material transaction must refer to an item/location/lot, the system uses the unit cost for that reference when generating transactions. If you move a purchase receipt or job completion quantity and new unit cost to an existing item/location/lot that already has a non-zero quantity, the system will post the cost change to the Inventory Adjustment account.

NOTE: You must use lot tracking to perform Specific costing. Due to the association between a cost and a location/lot combination, Specific costing is suited best for installations that are also using lot tracking to assign lot/batch numbers to the items as they are received.

About Changing an Item's Cost Method - Actual

CAUTION: Changing an item's cost method or cost type on the **Item Costs** form can cause the system to automatically post financial transactions that reflect the valuations differences between the old and new cost method or cost type.

If the change you make affects any of the five cost components of inventory, the system will debit or credit the appropriate inventory accounts. The system will make the balancing entry to the Inventory Adjustment Account.

From Average To:

LIFO

- Creates one LIFO/FIFO stack record for all stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.
- Assigns to the stack the accumulated quantity on hand from each stock location or lot location record.

FIFO

- Creates one LIFO/FIFO stack record for all stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts and whose quantity on hand is not equal to zero.
- Assigns to the stack the accumulated quantity on hand from each stock location or lot location record.

Specific

- Uses the value of the unit costs before this change was made.

Standard

- No change needed.

From LIFO to:

Average

- Calculates the total value of inventory and divides by the quantity on hand to determine the new unit cost.
- Computes the change in cost and posts changes to inventory accounts and inventory adjustment.
- Assigns the item unit cost and item Average unit cost to the new average (just calculated).
- Deletes LIFO/FIFO stacks.

FIFO

- Resets the unit costs in the Items form to the most recent cost.

Specific

- Determines average unit cost of items in LIFO/FIFO stack. (This will be new Specific cost.)

- Computes the change in cost and posts changes to inventory accounts and inventory adjustment.
- Deletes LIFO/FIFO stacks.

Standard

- Deletes the LIFO/FIFO stack records.

From FIFO to:

Average

- Calculates the total value of inventory and divides by the quantity on hand to determine the new unit cost.
- Computes the change in cost and posts changes to inventory accounts and inventory adjustment.
- Assigns item unit cost and item Average unit cost to the new average (just calculated).
- Deletes LIFO/FIFO stacks.

LIFO

- Resets the unit costs in the **Items** form to the most recent cost.

Specific

- Determines the average unit cost of items in the LIFO/FIFO stack. (This will be a new specific cost.)
- Computes the change in cost and posts changes to inventory accounts and inventory adjustment.
- Deletes LIFO/FIFO stacks.

Standard

- Deletes the LIFO/FIFO stack records.

From Specific to:

Average

- Computes the Average cost of items on hand.
- Assigns this value to the item's unit costs and Average costs.
- Adjusts the cost of the old (specific) inventory up or down to the new Average cost.

LIFO

- Creates one LIFO/FIFO stack record for all stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.
- Assigns to the stack record the accumulated quantity on hand from each stock location or lot location record.

FIFO

- Creates one LIFO/FIFO stack record for all stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.

- Assigns to the stack record the accumulated quantity on hand from each stock location or lot location record.

Standard

- Enters a zero the **Item Stockroom Location** or the **Lot Location** Unit Cost fields.

From Standard to:

Average

- Assigns the item's Average unit costs and unit costs to what the Standard costs had been.

LIFO

- Creates one LIFO/FIFO stack record for all item stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.

FIFO

- Creates one LIFO/FIFO stack record for all item stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.

Specific

- Assigns the unit costs on the **Item Stockroom Location** or the **Lot Location** records to the unit costs from the **Items** form.

About Changing an Item's Cost Method - Standard

CAUTION: Changing an item's cost method or cost type on the **Item Costs** form can cause the system to automatically post financial transactions that reflect the valuation differences between the old and new cost method or cost type.

If the change you make affects any of the five cost components of inventory, the system will debit or credit the appropriate inventory account. The system will make the balancing entry to the Inventory Adjustment account.

When you change the cost type from "Actual" to "Standard," you should always run the **Roll Current Cost to Standard Cost** utility again.

From Average to:

LIFO

- Creates one LIFO/FIFO stack record for all stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.

- Assigns to the stack the accumulated quantity on hand from each stock location or lot/location record.

- Indented Bulleted List

FIFO

- Creates one LIFO/FIFO stack record for all stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.
- Assigns to the stack the accumulated quantity on hand from each item stock location or lot location record.

Specific

- Assigns the Average unit costs to the item location.

Standard

- No change needed.

From LIFO to:

Average

- Calculates total value of inventory & divides by the quantity on hand to determine the new unit cost.
- (No accounting changes)
- Updates the item's average unit cost with the new average.
- Deletes the LIFO/FIFO stacks.

Specific

- Determines the average unit cost of items in the LIFO/FIFO stack. (This will be a new Specific cost.)
- Deletes LIFO/FIFO stacks.

Standard

- Deletes the LIFO/FIFO stack records.

From FIFO to:

Average

- Calculates total value of inventory & divides by the quantity on hand to determine the new unit cost.
- (No accounting changes.)
- Updates the item's average unit cost with the new average.
- Deletes LIFO/FIFO stacks.

Specific

- Determines average unit cost of items in LIFO/FIFO stack. (This will be new specific cost.)
- Deletes LIFO/FIFO stacks.

Standard

- Deletes the LIFO/FIFO stack records.

From Specific to:

Average

- Computes the Average cost of items on hand.
- Assigns this value to the item's unit costs & Average costs.

LIFO

- Creates one LIFO/FIFO stack record for all stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.
- Assigns to the stack the accumulated quantity on hand from each stock location or lot/location record.

FIFO

- Creates one LIFO/FIFO stack record for all the stockroom locations that share same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.
- Assigns to the stack the accumulated quantity on hand from each stock location or lot/location record.

Standard

- Assigns a zeros in the **Item Stockroom Location** or the **Lot Location** Unit Cost fields.

From Standard to:

Average

- Assigns the item's Average unit costs and unit costs to what the Standard costs had been.

LIFO

- Creates one LIFO/FIFO stack record for all the item stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.

FIFO

- Creates one LIFO/FIFO stack record for all the item stockroom locations that share the same set of material, labor, fixed overhead, variable overhead, and outside accounts, and whose quantity on hand is not equal to zero.

Specific

- Assigns the unit costs on the stockroom location or the lot location records to the unit costs from the **Item Costs** form.

About Repetitive Costing

The system requires that you use standard costing to utilize repetitive manufacturing and period-based costing. Period costing is effectively used when an item has predictable requirements for materials, labor, and machine hours. As a result, typical or earned costs are established for

manufacturing, and costing variances are based on the difference between expected or earned costs and actual posted costs.

The comparison is based on a user-defined time period that may be on a daily, weekly, or monthly basis, or any other time period that you choose. Material, labor, and machine hours are accumulated for work centers as a result of posting Just In Time production, completing quantities for a production schedule, or when posting work center transactions for labor, machine, or materials.

About Unit Costs

Standard Unit Cost

The amount that appears in the Unit Cost/Standard Unit Cost field (located on the Items, Mult-Site Items, and Item Costs forms) for an item depends on the cost method which you have instructed the system to use for that item. The table below summarizes the storage and posting of costs for the available cost methods.

When Cost Method is...	The field label is...	The field contains
Average (Actual)	Unit Cost	The item's average cost, used for inventory valuation. This is the cost at which the item will next be issued. It is updated using a weighted cost calculation each time the item is received into inventory. You can also change it by changing the values on the Cost Maint tab on the Item Costs form.
LIFO/FIFO (Actual)	Unit Cost	The unit cost value is mostly informational. The actual costs being used for inventory valuation and issuing the item are being stored in the Item Stockroom Locations form. With these methods, the Unit Cost will show you the next cost at which the item will be issued. If using LIFO, this is the unit cost tied to the last record in the Item LIFO file for the item. If using FIFO, it contains the cost tied to the first record currently in that file.
Specific (Actual)	Unit Cost	The unit cost value is mostly informational. It contains the last cost at which the item had been received. You can view the valuation and issue costs for the item on the Costs tab on the Item Stockroom Locations form (if the item is not lot tracked) or on the Item Lot Locations form (if lot tracked). It is also the cost used if the item's on-hand inventory is driven negative. The system updates it each time a receipt into inventory is processed for the item (PO receipt, job move to stock, etc.).
Standard	Standard Unit Cost	The item's standard cost, used for inventory valuation and for posting to the General Ledger for all transactions that move the

item in or out of inventory. For new items with on-hand inventory of 0 and which have had no material transactions (new items), you can enter a standard cost on the Cost Maint tab on the Item Costs form. Otherwise, you can change the standard cost only by running the Roll Current Cost to Standard Cost utility.

Current Unit Cost

The Current Unit Cost field maintains the cost for one unit of the item. The system automatically updates this field when you receive a purchase order or perform the Current BOM Cost Roll Up.

If you update the Current Unit Cost field on the Items or Multi-Site Items form (under Actual or Standard costing), the system calculates the Material cost on the Item Costs form using this calculation:

Material Cost = Unit Cost - Duty - Freight - Brokerage - Insurance - Local Freight

The system updates the Current Unit Cost field for purchased and manufactured items as follows:

Purchased Items

When "Average" displays in the Update Current Cost field on the Purchasing Parameters form, the Current Unit Cost field will contain the average purchase cost of the item. When you receive the item into stock using the PO Receiving function, the system calculates the new average cost and posts it to this field as follows:

AC = (OQOH * OAC) + (RQ * PUC) / (OQOH + RQ)

where:

- AC = Average Cost
- OQOH = Old Quantity On Hand
- OAC = Old Average Cost
- RQ = Receipt Quantity
- PUC = Purchase Order Unit Cost

NOTE: If the Cost Method is "Average," the Unit Cost field contains the Average unit cost. Therefore, the Current Unit Cost field does not also need to contain the Average cost.

If you enter "Last" in the Update Current Cost field, the Current Unit Cost field contains the last cost at which you received the item through the Purchase Order Receiving function. When you process the Purchase Order Receiving transaction, the system posts the purchase order line item unit cost to the Current Unit Cost field.

If you enter "None" in the Update Current Cost field, the system will never automatically post values to the Current Unit Cost field.

NOTE: If you are using some type of Actual costing, you can use the Current Unit Cost field to maintain a Standard cost for the item. Simply enter a cost into this field manually. The system will never change the value you enter.

When you run the Current BOM Cost Roll Up utility, the system posts the value in this field for purchased items to the Unit Cost field on all material records for this item in all standard bills of material.

Manufactured Items

For all manufactured items, the Current Unit Cost field holds the result of the Current BOM Cost Roll Up utility. This utility calculates the rolled-up cost for each manufactured item using the current routing and bill of material for the item. It totals the material, tooling, fixture, run, setup, overhead, and outside costs, and posts the result to this field.

For sub-assembly items, the system posts the rolled-up amount to the Unit Cost field on all material records of any bill of material which include the sub-assembly item.

Where Unit Costs are Stored

The following fields store the cost of each item:

Field	Form (cost tracking at item level)	Form (cost tracking at item/warehouse level)
Unit Cost/Standard Unit Cost	Items (held in total and display only)	Item/Warehouse (held in total and display only)
Current Unit Cost	Items (held in total and display only)	Item/Warehouse (held in total and display only)
Unit Cost	Item Costs (the cost detail components of the total cost)	Item/Warehouse Costs (the cost detail components of the total cost)
Current Unit Cost	Item Costs (the cost detail components of the total cost)	Item/Warehouse Costs (the cost detail components of the total cost)

The following fields control the way the system maintains, processes, and applies costs:

Field	Form (cost tracking at item level)	Form (cost tracking at item/warehouse level)
Post to Journals	General Parameters	General Parameters
Update Current Cost	Purchasing Parameters	Purchasing Parameters
Overhead Basis	Shop Floor Control Parameters	Shop Floor Control Parameters

Costs Based on Complete	Shop Floor Control Parameters	Shop Floor Control Parameters
Cost Type	Items	Item/Warehouse
Cost Method	Items	Item/Warehouse
Unit Cost/Standard Unit Cost	Items	Item/Warehouse
	Item Costs	Item/Warehouse Costs
Current Unit Cost	Items	Item/Warehouse
	Item Costs	Item/Warehouse Costs

Tracking Costs at the Item/Warehouse Level

By default, Infor CloudSuite allows for one cost per item, stored on the Items or Multi-Site Items form. However, you can also track item costs at the Item/Warehouse level, by selecting the Cost Item at Inventory field, on the Inventory Parameters form.

CAUTION: After you select this field and save the record, it cannot be deselected.

After selecting this field, the same item can now have several costs, depending on which warehouse stores it. In areas where the concept of a warehouse is not applicable (for example, Item Pricing and ABC Analysis), the cost from the default warehouse is used.

The system will continue to support only one bill of material for an item. Consequently, the Current Operations and Current Materials forms will be associated with the default warehouse, which is defined on the Inventory Parameters form. Items that have a Source value of Manufactured, Purchased, or Transferred will accumulate costs from their sub-components, and those sub-component costs will come from the default warehouse, which is defined on the Inventory Parameters form.

Co-Product and By-Product Costing

Use this topic for costing information when using co-products and by-products.

Co-Products

You can assign the cost distribution percentage between material, labor, and machine for each co-product job operation on the Co-Product Mix Operations form or the Co-Product Job Orders form for co-product mixes valued using the Actual cost method. If you do not assign the cost distribution percentages, the system calculates the cost distribution percentage between material, labor, and machine based upon the co-product item's BOM. (See About Co-Product Mix Distribution Formula and About Co-Products and By-Products for more information.)

NOTE: Set up costs are tracked separately from the labor costs of the co-product mix and are not used when calculating the labor cost distribution. Set up costs, however, are distributed among the co-product items in the job based upon the labor cost distribution.

If the co-product mix is valued using the Actual cost method, the costs which accrue to the job through material, labor, machine, outside, and other cost transactions are assigned to each of the co-products according to the percent distributions you have previously defined.

If the co-product mix is valued using the Standard cost method, each co-product is assigned a standard cost which does not vary. Co-products are issued into inventory at the standard cost for the item as defined on the **Items** form. Variances are calculated for the co-product mix as a whole. This variance is reported against an individual job and is not distributed to individual co-products. The system compares a consolidated BOM of co-product items to the job when calculating variances.

By-Products

By-products are identified on a job by a - (minus sign) in the bill of material. By-products are negative issued into inventory from a job, either manually or as backflush items. When a by-product is issued to a job from inventory, the cost of the by-product item is handled just as a regular material item.

NOTE: Variable Overhead Rates and Fixed Overhead Rates are not used with by-products.

Actual Cost Method

If a by-product is valued using the Actual cost method, when a by-product is issued from a job to inventory, the cost of the by-product is taken from the job. Adjustments are made to WIP.

Consider these attributes of by-products valued using the Actual cost method:

- Actual/FIFO and Actual/LIFO: A new stack is created and the cost is tracked through the stack when the by-product is issued to inventory. WIP is reduced by the planned cost.

- Actual/Average: the planned cost is used as the cost of the by-product. When the by-product is issued to inventory, the inventory cost is reaveraged using the planned cost of the by-product. WIP is reduced by the planned cost.

- Actual/Specific: inventory items are revalued at the lot/location when the by-product is issued into inventory. WIP is reduced by planned cost.

Standard Cost Method

If a by-product is valued using the Standard cost method, each by-product is assigned a cost that does not vary. By-products are issued from a job into inventory at the standard cost for the item as defined on the Items form. Adjustments are made to WIP.

Consider these attributes of by-products valued using the Standard cost method:

- Standard/LIFO and Standard/FIFO: A new stack is created at the planned unit cost but the by-product is still valued using the standard cost.

- Standard/Average: The average cost of the by-product is recalculated but the by-product is still valued using the standard cost.

- Standard/Specific: The specific cost of the by-product is recalculated for the lot/location, but the by-product is still valued using the standard cost.

Resetting By-Product Cost Amounts

You can reset the cost of by-products to the cost amounts defined on the Item Costs form by using these BOM Roll Up utilities:

- Job BOM Cost Roll Up and Estimate Job BOM Cost Roll Up: These utilities reset the by-product costs on the **Estimated Materials**, **Job Materials**, **Production Schedule Item Materials**, and **Production Schedule Release Materials** forms to the costs assigned on the **Item Costs** form.

- Single Level Current BOM Cost Roll Up and Current BOM Cost Roll Up: These utilities reset the by-product costs on the **Current Materials** form to the costs assigned on the Item Costs form.

Using Manual LIFO/FIFO Adjustment Utility to Change Item Cost Records

Use the Manual LIFO/FIFO Adjustment utility to change cost records for items that have a LIFO or FIFO cost method.

1   In the Manual LIFO/FIFO Adjustment Utility form, filter by item and by material, labor, fixed overhead, variable overhead and outside accounts. The selected item record is locked and remains locked during the entire adjustment process.

     This utility operates by first copying the entire stack to a working area. You can edit the working copy without affecting the original one. If you exit from this form or run another filter without posting your changes, the changes to the working stack are discarded.

2   Make corrections to stack entries in the grid. For example, you can add new entries and delete existing ones. Because the adjusted quantity must equal the on-hand quantity before you can post the changes, the total cost and quantity of the edited stack is shown. The cost may be different.

3   When all changes are complete, click the **Print/Process Updates** button. A copy of both the old and new stacks is printed, the net cost change is printed and posted to the IC Dist journal, and the existing stack is deleted and replaced with the adjusted one.

The output shows postings to the different components of the inventory accounts and the individual components of the unit cost.

Setting up Purchase Overhead Costs

To set up a product with a cost component for purchase overhead, use the Product Codes form. On the **Purchased Overhead** tab, specify this information:

- The type, whether to use a fixed amount or variable rate

- The amount, in the domestic currency or as a percentage of the purchased unit cost

    When you specify a component for purchase overhead cost, you must also specify what accounts, from the Chart of Accounts, to apply to journal entries for these values:

- The purchase overhead costs

- Any variances associated with the purchase overhead costs

NOTES:

- Purchase overhead costs can be applied only to items that have a purchase source.
- Although not required, we recommend that you use the Chart of Accounts form and the Unit Code 2 form to define accounts and unit codes to use in journal entries for products that have a cost component for purchase overhead. We recommend that you create two accounts: One for recording purchase overhead *applied* expenses and one for recording purchase overhead *variances*.

Costing Examples

See the online help for costing examples.

Costing Analysis

Costing Analysis Overview

As you make decisions about your business costs, you may need to investigate alternative costing scenarios. Costing analysis can help you determine how changes to one or more variables will affect costs, without actually changing existing costs in your system. For example, you may want to analyze the following:

- The effect of dependent materials costs that have a significant impact; for example, the erratic cost of aluminum.
- Rate changes for direct labor or overhead for production.
- Cost projections for an upcoming capital expenditure.
- Rollup of standard costs before committing a rollup, or comparing costs to a previous rollup.

Infor CloudSuite provides the **Costing Analysis Workbench** for creating costing alternatives. Costing alternatives are collections of items on the Workbench that you can work with in the following ways:

Capture a Year-End Snapshot

You can copy items *with* their complete BOM and routing to a costing alternative and then "freeze" them. This is typically done to create a year-end snapshot of costs for historical record keeping. You can save as many frozen costing alternatives as you need and keep them indefinitely.

Analyze Detailed Changes to the Copied BOM and Routing

You can copy items *with* their BOM and routing to a costing alternative; open the **Costing Analysis Alternative Current Materials** or **Costing Analysis Alternative Current Operations** forms to change specific items and labor rates in detail; and roll up the new item costs. You can then compare these changes with item current or standard costs, or with the costs in another costing alternative. These changes can be analyzed but not rolled to current.

Analyze Changes to Current or Standard Routing, with Option to Roll New Costs to Current

You can copy items *without* their BOM and routing to a costing alternative; selectively change the items' labor, material, and/or overhead rates; and roll up the new item costs. You can then compare your changes with item current or standard costs, or to the costs in another costing alternative. Continue making changes and comparing as needed. When the revised rates in your costing alternative are the values you want to use, you can copy them to Product Code, Work Center, Department, and Item master files using the **Costing Analysis Alternative Roll Costs to Current** form. This automatically updates the rates in your master files.

Forms Overview

This table describes the forms and reports provided for costing analysis:

Form	Use
Costing Analysis Workbench	For creating the different types of costing alternative records, for manually adding items to a costing alternative, and for comparing a new costing alternative with current or standard costs, or with the costs in another costing alternative.
Costing Analysis Alternative Copy	For adding groups of items to a costing alternative.
Costing Analysis Alternative Roll Up	For rolling up new item costs when you have made changes on the Workbench or using the Costing Analysis Alternative Current Materials or Costing Analysis Alternative Current Operations forms. When you roll up costs, subassemblies for manufactured items are added to the Workbench Items tab.
Costing Analysis Alternative Roll Costs to Current	For updating the rates in the Product Code, Work Center, Department, and Item master files with revised rates from your costing alternative. The only costing alternatives available for selection on this form are those for which you have not copied the BOM and routing.
Costing Analysis Alternative Current Materials	For modifying materials data for costing alternatives that include the complete BOM and routing for items added to the alternative. These changes can be analyzed but not rolled to current.
Costing Analysis Alternative Current Operations	For modifying operations data for costing alternatives that include the complete BOM and routing for items added to the alternative. These changes can be analyzed but not rolled to current.
Costing Analysis Alternative Inventory Variance Report	For reviewing costing alternative variance information.
Costing Analysis Customer Order Margin Report	For reviewing costing alternative margin information.

Creating Costing Alternatives

To create a costing alternative:

1   Open the **Costing Analysis Workbench** form. It can be accessed from the **Controller Home** form or Infor CloudSuite Explorer.

2   Click **New**.

3   Specify this information:

- **Costing Alternative**: Specify a name for this costing alternative.

- **Description**: Specify a description.

- **BOM Type**: Specify the routing type to use. If you don't roll costs to standard in Infor CloudSuite, you should choose Current.

- **Warehouse**: If your Inventory Parameters form is set to **Cost Items at Warehouse**, specify which warehouse to use. All costs will come from this warehouse. If you don't cost items at the warehouse level, this option isn't available.

- **Copy Routing**: Select this check box to copy the current BOM and routing for items added to the costing alternative.

    Copy Routing is typically used to create a year-end snapshot of rates for history or to analyze detailed changes to the current BOM and routing. Do not copy the routing if you want to selectively change items' labor, material, and/or overhead rates, and then use your changes to update master records.

4   On the Infor CloudSuite toolbar, click **Save**. After you save this record, you cannot change these values. To make changes, you must delete the record and start again.

5   The next step is to add items to your costing alternative, which you can freeze or for which you can change various costing rates for analysis. You can click **Copy Costing** to add groups of manufactured items using the **Costing Analysis Alternative Copy** form. You can also use the Items tab on the Workbench to add individual items. If you use the copy form, then after you process the copy, return to the Workbench and refresh the record to see added items. Following are several guidelines for adding items:

- For a year-end snapshot, you would generally add all of your standard costed finished goods to the alternative.

- For analysis of changes that you plan to roll to current, the items you add should be a representative sample of all items that will be affected by the changes you make to product codes, departments, work centers, and materials. When you roll up costs, you will have the option to add more items than just those in your costing alternative, if you want to check the impact of the new costs on a larger set of items.

6   After adding items, save the record.

7   Do one of the following:

- If the alternative is for a year-end snapshot, click **Frozen** to freeze the record. This process is complete.

- If the alternative is for analysis of detailed changes to a copied BOM and routing, you must click **Current Materials** and/or **Current Operations** to open forms for making changes to

analyze. On those forms, make your changes, and then click **Save**. Return to the Workbench and refresh the alternative record.

- If the alternative is for analysis of changes that you plan to roll to current costs, you must use the Product Codes, Departments, Work Centers, and Materials tabs on the Workbench to make changes. Make changes and then click **Save**.

8   The next step is to roll up new item costs for the changes you have made. See Rolling Up Costs for Costing Analysis.

Rolling Up Costs for Costing Analysis

Any time you add or change items in a costing alternative record, you must roll up the new item costs using the **Costing Analysis Alternative Roll Up** form. You will know that a rollup is needed when the **Roll Up** check box on the **Costing Analysis Workbench** form is selected. Frozen costing alternatives cannot be rolled up.

When you roll up costs in a costing alternative set to **Copy Routing**, that routing is copied into the costing alternative and accessed on the **Costing Analysis Alternative Current Operations** and **Costing Analysis Alternative Current Materials** forms. The **Change Cost Rates** utility may be used to make changes to the cost rates in the alternative current operations, if the costing alternative is not frozen.

When you roll up costs in a costing alternative for which the routing was *not* copied, the routing for the selected **BOM Type** is used as the basis, and any new rates from the Product Codes, Departments, Work Centers, and Materials tabs are applied to calculate the new unit costs. The **Change Cost Rates** utility and **Substitute Bill of Materials Components** utility do not apply to costs on these tabs.

To roll up new item costs:

1   Open the Costing Analysis Alternative Roll Up form.

2   Specify the costing alternative record to work with. (If you opened the form from the Workbench, the costing alternative record you were working on there is selected automatically.)

3   Optionally, you can specify criteria to restrict the roll up to a subset of the items in your costing alternative. For example, you can narrow your roll up by source, cost method, or a range of product codes or items. However, you will not be able to compare costs for any items that are not rolled up.

4   Make sure Item in Alternative List is set appropriately.

When selected, only items in the costing alternative record are rolled up. If you clear the check box, then the costing alternative will be populated with all items that match the criteria specified on this form. You could inadvertently add many thousands of items to the costing alternative. For more information about using this field, see Item in Alternative List.

5   Click **Process**.

New item costs are calculated, and subassemblies for manufactured items are automatically added to the Workbench Items tab. Now that the roll up is complete, you can use the Compare

tab on the **Costing Analysis Workbench** to compare costs. See Comparing Costs for Costing Analysis.

Comparing Costs for Costing Analysis

The Compare tab on the **Costing Analysis Workbench** is used for comparing costs for costing analysis. A rolled up costing alternative record can be compared with items' current or standard costs, or with costs in another costing alternative.

To compare costs:

1   Open the **Costing Analysis Workbench** form and select the costing alternative record for comparison.

2   Click the Compare tab. The selected costing alternative is displayed on the left side of the form.

3   On the right side of the form, do one of the following:

- To compare the costing alternative with the items' current or standard costs, specify a BOM type.

- To compare with an existing alternative, specify a different costing alternative.

4   In the middle of the form, select an item in the grid. Comparison data for the item is displayed on the tabs at the bottom of the form:

- The Operations tabs show operations on the routing for the selected item.

- The Materials tabs show components on the single-level bills of materials for the selected item.

- The Routing tabs show the expanded bill and routing for the selected item. Click the nodes to expand each level.

- The Assembly tab on the left shows the total final assembly costs for the selected item in the costing alternative. The Assembly tab on the right matches the assembly costs on the **Item Costs** form, Cost Detail tab if you are comparing to current or standard costs.

- The Accumulated tab on the left shows the total accumulated costs for the selected item in the costing alternative. The Accumulated tab on the right matches the accumulated costs on the **Item Costs** form, Cost Detail tab if you are comparing to current or standard costs.

5   You can make additional changes to the costing alternative as needed for your analysis.

If this analysis is for a costing alternative that did not use a copied routing, and if your analysis shows that the revised rates are where you want them, the next step is to roll the rates to current using the **Costing Analysis Alternative Roll Costs to Current** form. See Costing Analysis Alternative Roll Costs to Current.

Defining Lead Time

Defining Lead Time for APS Planning

In certain planning situations, the system may use lead time to approximate the time needed to acquire, make, or receive an item. In all cases, lead time is defined in the following fields on the **Items** or **Multi-Site Items** form:

- Fixed Lead Time
- Variable Lead Time
- Expedited Fixed Lead Time
- Expedited Variable Lead Time
- Paper Work Lead Time
- Dock-to-Stock Lead Time

NOTE: Paper Work Lead Time and Dock-to-Stock Lead Time are also used by the MPS Processor, Material Planner Workbench Generation, and on the Order Action Report.

This topic describes how lead time applies to purchased items, manufactured items, and transferred items. It also describes how to use the Expedited Lead Time functionality.

Where Purchased Item Lead Time is Used

For purchased items, you must enter the lead time values manually in the lead time fields. The system uses purchased item lead time to perform the following functions:

- To calculate the release date of a purchase order when you firm a planned order. The system deducts the item's dock-to-stock lead time from the operation's start date, if not blank, or the job's start date if the operation's start date is blank.
- When you cross-reference and create a purchase order from a job material. The system deducts the item's dock-to-stock lead time from the operation's start date, if not blank, or the job's start date if the operation's start date is blank.
- When you manually create a purchase order line or purchase order requisition line and an vendor contract exists for the item and the PO vendor. The system calculates the default due date by adding the item vendor record's lead time to the appropriate date:
  - PO line: adds item vendor lead time to PO order date.
  - Blanket PO release: adds item vendor lead time to the release date you entered.
  - PO requisition line: adds item vendor lead time to the requisition date.
- To calculate the due date of safety stock planned orders (current date/time + lead time).

Where Manufactured Item Lead Time is Used

For manufactured items, you can enter the lead times manually or use the Lead Time Processor to generate the lead times from the current routing's operation times. The system uses lead time to plan manufactured items in these situations.

- To plan the start date of a job when any of these conditions are true:
  - The item has no routing.
  - The MRP Item field is selected for the item on the Items form.
- To calculate the due date of safety stock planned orders (current date/time + lead time).
- To determine which routing and BOM to use when planning a requirement for an item. The system decides which routings and BOMs to use through the indented bill of manufacturing by using lead time to estimate when they will be used, and then comparing those times to the effective dates for the possible routings and BOMs.

NOTE: For manufactured items that are not specified as MRP Items, lead time is not used when the system passes parent item requirements down to components. Component due dates are based on the start date of the operation where the component is used (or the start date of the job, depending on the setting of the Plan Materials at Operation Start planning parameter).

Where Transferred Item Lead Time is Used

The system uses lead time to plan transfer orders if:

- You are running APS Planning (in single-site mode) and the demand is for an item with a remote Supply Site. Planned transfer demand is replicated to the Supply Site. See Setting Up Planned Transfer Order Replication for more information.
- You are running APS Planning (in global mode), the demand is for an item with a remote Supply Site, and the system cannot contact the remote site to plan the transfer order. The transfer supply is planned at the local site using lead time.

The system calculates lead time for transferred items in the same manner as purchased and manufactured items, except it adds the transit time (defined on Inter-Site Parameters) to the total lead time. For example, if an item's lead time from the FLT + (VLT * Qty) calculation is 1 day, and it takes 3 days to ship to the receiving site, the total lead time is 4 days.

Release Date Calculation

APS calculates the Release Date during the Planning run, using Current Operation times and any constraints caused by material or shift capacity (either infinite or finite). The following formula is used:

Start/Release Date = PLN Due Date - (FLT + DSLT + PWLT + (VLT * Quantity Required))

where:

FLT = Fixed Lead Time

VLT = Variable (per-piece) Lead Time

DSLT = Dock-to-Stock Lead Time

PWLT = Paperwork Lead Time

EXAMPLE: For this example purchase order, assume the following conditions:

- Current date/time = 5/16/2002 (Thursday) at 08:00.
- Planned purchase order due date = 5/30/2002 at 08:00.
- Quantity = 10
- Purchased item's lead times are:
    - FLT = 1 day
    - VLT = 0.5 hour (although purchased items usually have a VLT of 0, a non-zero value is used here for illustration purposes)
    - DSLT = 1 day
    - PWLT = 0.5 day

The system calculates the release date of the purchase order by performing this calculation:

1   Sums the FLT, DSLT, and PWLT lead time values for a result of 2.5 days.

2   Multiplies the VLT value of 0.5 by the quantity of 10 for a result of 5 hours.

3   Adds 5 hours to (2.5 days * 24 hours) for a result of 65 hours total lead time.

4   Starting at the due date (5/30/2002 at 08:00), the system counts backward 65 hours. By default, it accumulates lead time 24 hours per day, 7 days per week.

5   The resulting release date is 5/27/2002 at 14:00.

Hours vs. Days

The lead time values expressed in days on system forms are converted to hours during these calculations.

24-hour Calendar

For all calculations involving lead time, the system assumes a 24-hour day X 7-day week by default. If you are using APS, you can configure it to use a defined range of business days by creating a shift named **PCAL** on the Scheduling Shifts form. See Using Lead Time Shifts for more information.

Using Expedited Lead Times

For special cases where you need to reduce the normal lead time, you can use the expedited lead time features. APS uses expedited lead time when the initial pull planning using standard lead time projects a date in the past. You can apply lead time reduction for specific items or apply it to all items.

NOTE: When you use mass cross-referencing through the Material Planner Workbench Generation form, expedited lead time is not used.

The Use Expedited Lead Time parameter on the Planning Parameters form enables or disables the application of expedited lead times at the item level and global lead time reduction. You can enable or disable expedited lead time usage for runs of APS Planning (select **For Planning**) and/or for Get ATP/CTP operations (select **For ATP/CTP**).

Expedited Lead Time for Specific Items

If you specify a value for the Expedited Fixed Lead Time or Expedited Variable Lead Time values on an item, the lead time calculations use the expedited values INSTEAD of the item's normal Fixed Lead Time and Variable Lead Time values. For example, if Expedited Fixed Lead Time contains a value, the lead time calculation would be:

Start/Release Date = Due Date - **EFLT** + (VLT * Quantity)

NOTE: Expedited lead time applies to all receipts of the specified item. To specify early receipt of a single item for a single demand, use the Expected Receipts APS form. When analyzing "what if" planning scenarios, use the What If Expected Receipts form.

Global Lead Time Reduction

You can also reduce lead time for all items using the Fixed and Variable Lead Time Reduction parameters on the Planning Parameters form. These options reduce the standard fixed and/or variable lead time by the specified value for all items.

During planning, the system calculates the total lead time with this formula:

Start/Release Date = Due Date - (FLT - **FLTR**) + ([VLT - **VLTR**] * Quantity)

where:

EFLT = Expedited Fixed Lead Time

FLTR = Fixed Lead Time Reduction

EFLT = Expedited Variable (per-piece) Lead Time

VLTR = Variable Lead Time Reduction

Depending on the combination of selected options and values, there may be other combinations of the lead time formula, such as:

Start/Release Date = Due Date - (FLT - FLTR) + (VLTR * Quantity)

  or

Start/Release Date = Due Date - EFLT + ([VLT - VLTR] * Quantity)

Notice that the Fixed/Variable Lead Time Reduction values reduce the standard lead times, while the Expedited Fixed/Variable Lead Time values specified on the Items form actually replace the standard lead times.

Indication of Expedited Lead Time on Output Forms and Reports

On the Purchase Order Lines, Purchase Order Blanket Releases, and Purchase Order Requisitions Lines forms, the **Expedited** field indicates when the system used expedited lead time to plan a line item.

On the Purchase Order Report, Change Order Report, PO Requisition Report, and the Change Order Detail Report, a note indicates when the system used expedited lead time to plan a line item.

On the Planning Detail form, Exceptions Report, or Material Planner Workbench form, the "Used Expedited Lead Time" exception message appears for a supply record if the system used expedited lead time to allocate that supply to a demand.

Handling Temporary Vendor Lead Time Problems

Your vendors may have temporary problems meeting their lead times for certain items. To ensure that APS creates the planned order for a purchased item with the appropriate lead time in this situation, enter the Earliest Planned Purchase Receipt date on the Items form.

This date temporarily overrides the item's standard and expedited lead times. When APS creates a planned order for this item, it determines that the item can be received either by the current date + lead time or by this Earliest Planned Purchase Receipt date, whichever is later.

Defining Lead Time for MRP Planning

In certain planning situations, the system may use lead time to approximate the time needed to acquire, make, or receive an item. In all cases, you define lead time for MRP Planning in the following fields on the **Items** or **Multi-Site Items** form:

Fixed Lead Time

Variable Lead Time

Dock-to-Stock Lead Time

NOTE: Expedited Fixed Lead Time and Expedited Variable Lead Time are used only in APS mode. Paper Work Lead Time (in addition to Dock-to-Stock Lead Time) is used by the MPS Processor, Material Planner Workbench Generation, and on the Order Action Report.

This help topic describes how lead time applies to purchased items, manufactured items, and transferred items.

Purchased and Manufactured Item Lead Time

For purchased items, you must enter the values manually in the lead time fields. For manufactured items, you can enter the lead times manually or use the Lead Time Processor to generate the lead times from the current routing's operation times.

How the System Determines a Planned Order Start Date

When MRP creates a planned order, it determines the planned order's internal start date by backward planning the requirement from the due date to the item's lead time (counting only days on the MDAY calendar), where lead time is calculated as:

Fixed Lead Time + (Variable Lead Time * Quantity Required)

This PLN start date is not displayed on any form or report, but the system uses it as the due date of component PPLN requirements exploded from the PLN. For example, suppose item A's lead time is 3 days. Item A is made from component B. The system creates a PLN for item A due on 4/22. The PLN's internal start date is calculated to be 4/19. The due date of the PPLN for item B will also be 4/19.

How the System Determines a Job or PO Start/Release Date

When you firm a planned order, MRP determines the start or release date of the resulting job or purchase order using this calculation:

Start/Release Date = PLN Due Date - Fixed Lead Time - (Variable Lead Time * Quantity Required) - Dock-to-Stock Lead Time

Purchased items typically have a fixed lead time, a dock-to-stock and paperwork lead time, but usually no variable lead time.

EXAMPLE: For this example purchase order, assume the following conditions:

- Current date/time = 5/16 at 08:00.
- Planned purchase order due date = Monday 5/31 at 08:00.
- Quantity = 10
- Purchased item's lead times are:
    - FLT = 1 day
    - VLT = 0.5 hour. Although purchased items usually have a VLT of 0, a non-zero value is used here for illustration purposes.
    - DSLT = 1 day

The system calculates the release date of the purchase order by performing this calculation:

1 Sums the FLT and DSLT lead time values for a result of 2 days.

2 Multiplies the VLT value of 0.5 by the quantity of 10 for a result of 5 hours.

3 Adds 5 hours to (2 days * 24 hours) for a result of 53 hours total lead time.

4 Starting at the due date (Monday 5/31 at 08:00), the system counts backward 53 hours, counting only days on the MDAY calendar (for this example, assume the MDAY calendar is 8 a.m. - 5 p.m. Monday - Friday with a 1-hour lunch break at 12:00).

5 The resulting release date is Thursday 5/20 at 11:00.

Where Purchased Item Lead Time is Used

In addition to calculating the start date of the planned order and the release date of a PO firmed from a planned order, MRP also uses purchased item lead time to perform the following functions:

- When you cross-reference and create a purchase order from a job material, the system deducts the item's dock-to-stock lead time from the operation's start date, if not blank, or the job's start date if the operation's start date is blank.

- When you manually create a purchase order line or purchase order requisition line and a vendor contract exists for the item and the PO vendor, the system calculates the default due date by adding the item vendor record's lead time to the appropriate date:

  - PO line: adds item vendor lead time to PO order date.

  - Blanket PO release: adds item vendor lead time to the release date you entered.

  - PO requisition line: adds item vendor lead time to the requisition date.

Where Manufactured Item Lead Time is Used

In addition to calculating the start date of the planned order and the start date of a job firmed from a planned order, MRP may use manufactured lead time to determine the due date of material components when exploding requirements from a job to the job bill of material. See the Plan Materials at Operation Start help topic for details about the situations in which lead time is used to plan the due date of material components.

MRP also uses manufactured item lead time to determine the effectivity of the operations and materials.

You can use the Lead Time Processor to calculate the lead time for all manufactured items automatically, using the current operation times.

Transferred Item Lead Time

The system calculates lead time for transferred items in the same manner as purchased and manufactured items, except it adds the transit time (defined on Inter-Site Parameters) to the total lead time. For example, if an item's lead time is 1 day, and it takes 3 days to ship to the receiving site, the total lead time is 4 days. See Setting Up Planned Transfer Order Replication for more information.

About the Lead Time Processor Algorithm

The purpose of the Lead Time Processor (LTP) utility is to calculate an item's fixed and variable lead times using the Duration of the operations that make up its current routing. The fixed lead time is expressed in days. The variable lead time is expressed in hours and is the run time for one piece.

Basic Algorithm

Fixed Lead Time

Here's the algorithm the Lead Time Processor uses to calculate Fixed Lead Time.

1   Sums the setup, move, queue, and finish hours on all operations in the item's current routing.

2   Divides the total by the average hours in a day on the DSC shift (the "default" shift).

3   Rounds up or down to the nearest whole number.

4   Posts the resulting number of days into the Fixed Lead Time field in the Item record.

Variable Lead Time

Here's the algorithm the Lead Time Processor uses to calculate Variable Lead Time.

1   Sums the run duration on all operations in the item's current routing.

2   Multiplies the total by 100 / the operation's Efficiency percentage.

3   Posts the resulting number of hours into the Variable Lead Time field in the Item record.

Fixed Schedule Hours

If an operation has a value in the Fixed Sched Hrs field, the Lead Time Processor adds that figure to the move, queue, setup, run, and finish times.

Use WC Calendar and Use Offset Hrs

The Use WC Calendar and Use Offset Hrs options ensure that the system's lead time calculations are more accurate if you are using operation overlapping and multiple scheduling shifts with varying hours per day. The following explains how using those two options will affect the calculations.

Use WC Calendar

If some of the operations in the item's current routing have more or fewer hours per day than the shift, the date the MRP or APS planning arrives at when creating planned orders may different than the date the Scheduler generates.

Enable the Use WC Calendar option to factor in the variable length calendars and compensate for the extra hours available per day. If you select Use WC Calendar, the Lead Time Processor calculates a shift factor for each operation that does not use the shift. To arrive at this shift factor, the LTP uses the scheduling shift specified for the operation's Work Center, using this calculation:

(average hours per day from shift / average hours per day from operation's work center shift)

The Lead Time Processor then multiplies the shift factor by the fixed and variable times for the operation. For example, if an operation that uses a 10 hour/day work center has one hour per piece of run duration and the shift has eight hours, there will be 0.8 hours added to the cumulative variable lead time for the item.

Use Offset Hours

This option allows you to factor the operation offset hours into the lead time calculations. If you clear the Use Offset Hours field, the Lead Time Processor simply accumulates the setup and duration for each operation as described above. This calculation assumes that each operation starts when the previous one finishes and gives no consideration to operation overlapping (which is defined in the Offset field).

When you select Use Offset Hours, the algorithm attempts to compensate for the overlap. When the Lead Time Processor encounters an operation with offset hours, it subtracts the previous operation's fixed and variable times from the running totals and adds the current operation's offset to the total fixed time. Therefore, the system assumes that the current operation's offset is the duration of the previous operation. It does not change the actual values in the move, queue, setup and run hours fields of the previous operation.

Using Lead Time Shifts

This topic applies to APS.

Lead time for an item accumulates for 24 hours per day, 7 days per week. For example, if an item's fixed lead time is 6 days (and variable lead time=0), and an order is placed for it on Monday, the lead time indicates the order's earliest availability at Sunday. But for your business, Saturdays and Sundays may not be valid days for accumulating lead time.

To represent this concept of business days for lead time calculations, define a scheduling shift named PCAL. The system uses this shift when calculating lead time for all items in your database. APS interprets the lead time for an item as "working time" on the lead time shift. For example, for a purchased item, a lead time amount of working time from the item's due date offsets the time the purchase order must be placed at the vendor.

Although the system will use this special shift for lead-time calculations for all types of items (Purchased, Manufactured, or Transferred), this concept applies in most cases only to purchased items. Manufactured and transferred items are usually planned according to their routing/bill of material. See Defining Lead Time for a discussion of where the system uses lead-time calculations.

NOTES: If the Time Fence Rule for the item is set to "Specific," the system uses a 24 hours x 7 days calendar instead of using the PCAL.

Other system processes (such as the Material Availability Report and the MPS Processor) use the default scheduling shift, Minimum Hours in Work Day, and MDAY Start/MDAY End planning parameters to determine valid manufacturing days.

Creating the PCAL Shift

To create the PCAL shift:

1   Open the Scheduling Shifts form.

2   Click the Filter-In-Place button to turn off filter-in-place mode.

3   Select **Actions > New** to create a new shift record.

4   In the Shift ID field, enter **PCAL**. The lead time shift must have this shift ID.

5   In the Starting Day, Starting Time, Ending Day, and Ending Time fields, enter the range for each day of this shift (just as you define a normal shift record). See Defining the Work Week for details on defining the days of a shift record. Typically, you will define the days in the lead time shift to run from 00:00 to 24:00.

6   Select **Actions > Save** to save the lead time shift.

EXAMPLE: Assume you define the lead time shift to run from 00:00 to 24:00 on Monday through Friday (Saturdays and Sundays are off-shift days). Part 123 has a Fixed Lead Time of 0.0 and a variable lead time of 1 hour. You have an order for part 123 with a quantity of 60, which is placed on August 9 (Friday) and due on August 26 (Monday) at 12:00. To determine the latest time the order can be placed to satisfy the requirement, the system starts at the due date and moves back until it finds 60 hours of working time.

1   (Due Date) Monday Aug. 26: 12:00-00:00 (12 hours)

2   Sunday Aug. 25: Off-shift

3   Saturday Aug. 24: Off-shift

4   Friday Aug. 23: 24:00-00:00 (24 hours)

5   Thursday Aug. 22: 24:00-00:00 (24 hours)

The result is that the order would need to be placed by 00:00 (12:00 a.m.) on August 22 to meet the due date. You would see this result in the release date of the purchase order you firm from the planned order.

Working with ECNs

Engineering Change Notice Steps

Use this process to record engineering changes to an item in inventory and to update the related operations and materials. Use Engineering Changes Notices (ECN) for inventory, job orders, and estimates.

NOTE: The system may prevent you from adding items flagged obsolete or slow-moving to an ECN.

Order of Events

1   Create the ECN header on the Engineering Change Notices form.

2   Create the ECN line items on the Engineering Change Notice Items form.

3   Approve an individual ECN record on the Engineering Change Notices form, or use the Change ECN Status Utility and Change ECN Item Status forms to approve a range of ECNs.

4   After approving an ECN record, post it with the Post Engineering Change Notice form.

Creating an Engineering Change Notice Header

1   Open the Engineering Change Notices form.

2   Select **Actions > New**.

3   Enter the appropriate data:

- **Requested Date** - Enter the date the ECN was requested or accept the default of the current system date.
- **Effective Date** - Enter the date these ECN changes take effect or accept the default of the current system date.
- **Originator** - Enter the name of the person making the request. the system does not validate this field.
- **Priority** - Enter the Priority Code to define when the changes should take place when the effective date arrives.
- **Reason** - Enter the reason code to explain why an ECN was requested.
- **Distribution** - Enter the distribution code to list the people who receive notification of the ECN.

- **Notes** - Enter any other pertinent information specific to the ECN. The system does not validate this field.

4 Select Actions > Save.

Creating an Engineering Change Notice Line Item

ECN line items define the changes to the inventory item, job order, or estimate job, at an operation, material, or material reference level.

1 Open the Engineering Change Notice Items form.

2 Select **Actions > New**. The ECN must have a status of **Requested**.

3 Enter data in the required fields:

NOTE: Current Operation, **Current Materials**, or **Material References** refers to the inventory item's current operations, materials, or material references.

Line Item	Required Fields
Operations	Work Center
	Move
	Queue
	Setup
	Offset
	Backflush
	Mach Hrs per Piece or Pieces per Mach Hr
	Labor Hr per Piece or Pieces per Labor Hr
Materials	Seq
	Type
	Quantity
	U/M
	Probable

	Increm Price
	Ref Type
	Per/Unit or Lot
	Unit of Measure
Costs	Material
	Labor
	Fixed Overhead
	Variable Overhead
	Outside
References	Seq
	Reference Seq

The **ECN Line Items** fields are:

- **Status** - Select the status of the ECN line item or accept the default option, which is **Requested**.
- **Action** - Enter the action to take with this particular line item or accept the default option, which is **Updated**.

4 Select Actions > Save.

Approving an Engineering Change Notice

You can approve an ECN at the individual item level or at the header level. If all ECN line items have been approved, approve the ECN at the header level. If the statuses of the ECN line items vary, you must approve at the individual line item level. You must "Approve" or "Not Approve" an ECN before you can post it.

Approving an ECN at the Item Level

1 Open the Change ECN Item Status form.

2 Specify values for the following fields:

- **From Item Status** - Enter the current status of the ECN lines to approve.

- **To Item Status** - Enter the status **Approved**.
- **Starting** and **Ending ECN** - Enter the starting and ending ECNs to approve.
- **Starting and Ending ECN Line** - Enter the starting and ending ECN line numbers to approve.

3   (Optional) To preview the affected records before saving them to the database, click **Preview**.

4   To save changes in the database, click **Commit**.

5   Click **Process**.

Approving an ECN at the Header Level

1   Open the Change ECN Status form.

2   Edit the following fields:

- **To Status** - Change the status to **Approved**.
- **Starting** and **Ending ECN** - Enter the starting and ending ECNs to approve.

3   (Optional) To preview the affected records before saving them to the database, click **Preview**.

4   To save changes in the database, click **Commit**.

5   Click **Process**.

Posting an Engineering Change Notice

To post an ECN:

NOTE: You must approve or not approve an ECN before you can post it.

1   Open the Post Engineering Change Notice form.

2   In the **ECN** field, select the ECN you want to post.

3   Click the **Process** button.

4   (Optional) To review the results, run the Item Current Routing Report.

Changing or Creating an Item Revision

To create or change an item revision:

1   Open the Change Item Revision form.

2   Enter the appropriate data in the following required fields:

- **Item** - Enter a valid inventory item number.
- **New Revision** - Enter an 8-character unique identifier.

- **Drawing** - Enter a 25-character number, character, or combination, to use as the drawing ID number.

3 Select **Commit**.

4 Click **Process**.

Using MRP and APS

Forecasting Overview

Forecasting requires you to project the future requirements for an item based on your past usages of the item, sales predictions, etc. This topic describes how MRP and APS plan forecasts as independent requirements and how existing demands, such as customer orders, consume the forecasts.

Creating a Forecast

You create a forecast for a given item on the Forecast form. Enter the Original Quantity to specify the quantity you are forecasting a need for (the "demand quantity"). Enter the Forecast Date to represent the due date of the forecast. Enter the Warehouse to forecast for a specific warehouse. If you have elected to create independent requirements based on customer orders (see Use Customer Order or Forecast for more information), then you may also specify a customer when creating a forecast.

About the Use CO or Forecast Planning Parameter

The Use CO or Forecast parameter on the Planning Parameters form determines whether the system plans forecasts and/or customer orders as demands/requirements. For example, if this parameter is set to Forecast, customer orders are not planned and the system uses the forecast's Original Quantity as the demand quantity instead of using the Outstanding Requirement. All examples in this help topic assume the Use CO or Forecast field is set to **Both**.

CAUTION: If the Use Co or Forecast parameter is set to Both, and you change either the Forecast Look Ahead or Forecast Look Behind parameter values, the system may reevaluate forecast consumption for all items, and this process may take a long time.

How Forecasts are Planned

When you initially create the forecast, the value in the Outstanding Requirement field equals the value in the Original Quantity field. Existing demands (such as customer orders entered before you run the MRP Planning or APS Planning activity) consume the forecast quantity from this Original Quantity value. The Outstanding Requirements value reflects the remaining forecast quantity that will drive independent requirements for planning (for both MRP and APS). See "How Existing Demands Consume the Forecast" below for details about which demands can consume the forecast quantity.

The process the system uses to plan forecast requirements is different depending on whether you are running MRP or APS.

How MRP Plans Forecasts

MRP plans forecasts according to this process:

1   Plans the Outstanding Requirement quantity from forecasts (and quantities from other independent requirements, such as customer orders) for a given end item.

2   Searches for existing on-hand and receipts to satisfy the requirement.

3   Creates a planned order for the net requirement after on-hand inventory and planned supplies have been considered.

4   "Explodes" this net requirement from the planned order through the item's bill of material, creating the dependent requirements for the component materials. See MRP Overview for more information.

NOTE: In the PROGRESS version of the application's MRP, the planning parameter "CO and Forecast On Line" updated the forecast consumption information automatically whenever you added, changed, or deleted a forecast or customer order. In the SQL version of the application, this functionality is in place by default (due to the SQL database table structure). For example, if you add a new forecast, that forecast will be visible immediately on reports and output forms without requiring you to rerun MRP.

How APS Plans Forecasts

APS plans forecasts according to this process:

1   Plans the forecast before or after planning other demands according to your APS order priority.

2   Allocates any available on-hand inventory and planned supplies (within Supply Usage Tolerance), further reducing the forecast quantity to be planned. Keep in mind that other demands such as customer orders will probably have priority over forecasts for using on-hand inventory and planned supplies, depending on how your order priorities are set.

3   Explodes, as required, the net requirement from the planned order through the BOM for this demanded quantity of the item.

4   Generates planned orders at all levels needed to satisfy the remaining forecast quantity. The forecasted item's planned order's Projected Date indicates the availability date of the forecast supply.

New incoming demands can use this forecast's supply only after the planning run is complete, when you incrementally plan them during a save or Get ATP/CTP process.

NOTE: If a demand consumes a forecast, any subsequent Get ATP/CTP process you perform on that demand will consider this consumption of forecasted supply in the calculation of the Projected date.

EXAMPLE:

For this example, assume these conditions:

- On-hand inventory: 150
- Forecast-XYZ Original Quantity: 200
- Priority for customer orders on the APS Order Priority form is set so the system plans customer orders before it plans forecasts.

You enter a customer order for a quantity of 120. The customer order consumes the forecast (assume the customer order is due within the Forecast Look Behind/Ahead window). The forecast's Outstanding Requirement is reduced to 80.

You then run APS Planning. The system first plans the customer order demand. It allocates the on-hand inventory to the customer order, satisfying the order and leaving a remainder of 30 on hand. Then the system plans the forecast demand. It allocates the remaining 30 from inventory and generates a planned order for 50 to satisfy the remaining forecast demand.

How Existing Demands Consume the Forecast

The Forecast Look Behind and Forecast Look Ahead parameters specified on the **Product Codes** form and/or on the **Planning Parameters** form set up a time window within which existing customer orders and other demands can consume a forecast. The system uses this window when searching for a forecast to place a customer order against. The search for a forecast works as follows:

1 The system tries to locate a forecast for the same date as the demand's due date. The system ignores old forecasts if the Forecast Date is more working days into the past than the current date + the Forecast Look Behind value.

2 If a forecast matching the demand's due date does not exist or is already consumed (an Outstanding Requirement equal to zero), the system starts at the demand's due date minus Forecast Look Behind and searches for a forecast up to the demand's due date plus Forecast Look Ahead.

3 If the system finds a matching forecast, it checks whether the forecast is already consumed. If the forecast has been consumed, the system locates the next valid forecast.

4 If the demand quantity is greater than the Outstanding Requirement, the system sets the Outstanding Requirement to zero, and applies the remaining demand quantity to the next valid forecast. If the system does not find a valid forecast, the demand does not consume any forecasts.

5 On the **Forecast** form, Customer and Warehouse are optional forecast fields that also influence the process by which demand is matched to a given forecast. The search is performed in this order:

   a On Customer and Warehouse

   b On Warehouse only when Customer is null

   c On Customer only when Warehouse is null

---

      d   On forecast records when Customer and Warehouse are both null

---

EXAMPLE:

For this example, assume these conditions:

Forecast Look Ahead: 7

Forecast Look Behind: 4

Forecasts for:
50, due 10/1
60, due 10/5
50, due 10/9
50, due 10/13

Customer orders (COs) for:
20, due 9/20
20, due 9/25
10, due 10/2
15, due 10/5
30, due 10/15
25, due 10/17

1   For the CO on 9/20: there is no forecast for 9/20, so searching starts from 9/16 through 9/27. No forecast is found, so this CO does not consume a forecast.

2   For the CO on 9/25: there is no forecast for 9/25, so searching starts from 9/21 through 10/2. There is a forecast for 10/1. The system subtracts 20 from Outstanding Requirement, leaving 30.

3   For the CO on 10/5: there is a forecast for 10/5. The system subtracts 15 from Outstanding Requirement, leaving 45.

4   For the CO on 10/15: there is no forecast for 10/15, so searching starts from 10/11 through 10/22. There is a forecast for 10/13. The system subtracts 30 from its Outstanding Requirement, leaving 20.

5   For the CO on 10/17: there is no forecast for 10/17, so searching starts from 10/13 through 10/24. There is a forecast for 10/13. The system subtracts only 20 from the Outstanding Requirement because that is all that remains. The remaining five are subtracted from the next available forecast.

NOTE: If forecasts appear at multiple levels in a bill of material, a forecast for a parent material cannot consume the supply from the forecast for a child material (unless the child forecast generates excess quantity because of an Order Minimum specification, in which case the excess quantity can be used).

About Exception Messages

The APS Planning, MRP Planning, and MPS Processor functions generate various messages that describe any discrepancies that occur when you run these applications. Each message suggests a specific corrective action.

You can view exception messages on the Planning Detail and Intra-Site Transfer Detail forms, or run the Exceptions Report for a printed list of exception messages.

Each exception message is explained below:

Exception Message	Description
Add MPS Order	(Generated only by the MPS Processor, displays only in the Master Planning Report.) There are more requirements than quantity on-hand + scheduled receipts for an item prior to the current date + MPS Plan Fence. Use the Master Production Schedule form to create an MPS receipt to satisfy the requirements.
X-Ref Rcpt: Qty 9999.999	The quantity on the receipt (supply order) is different than the quantity of the cross-referenced requirement (demand order). The planning process assumes the receipt still meets the requirement, but you must adjust the quantity on the receipt. For example, if a customer order is cross-referenced to a job and you have increased that customer order's quantity, you must increase the job's quantity. This message displays the new quantity the job should produce. NOTE: If the date and quantity are both changed on the customer order, only the date message (X-Ref Rcpt: Resched) prints. The quantity message prints only if the customer order date was not changed.
X-Ref Rcpt: Resched YYYY-MM-DD	The date of the receipt (supply order) is later than the date of the cross-referenced requirement (demand order). The planning process assumes the receipt still meets the requirement, but you must adjust the date of the receipt. For example, if a customer order is cross-referenced to a job and you changed that customer order's due date, you must change the job's end date to match the customer order's due date. The same situation applies for purchase orders. The message displays the date to which the receipt should be moved. The PO and Job Reschedule Tolerance Factors on the Planning Parameters form control this exception message.
Expedited 999 Days (Late 999)	The APS system created a planned receipt using an item's Expedited Lead Time to satisfy a demand. The number of days shown is the difference between the standard lead time and expedited lead time values. The number of days shown in parentheses displays only if the demanding/parent order was made late because of this receipt.

Date Outside Shop Calendar	The current MDAY calendar does not contain the date of the record.
Initial Quantity On Hand Negative	The current Quantity On Hand is below zero. This may occur when you select the On Hand Neg Flag on the Inventory Parameters form (which allows a quantity on hand to be below zero).
Move In Rcpt: YYYY-MM-DD	If you are using MRP, system determined that a job or purchase order receipt is needed sooner than the current due date; a reschedule date appears with the exception message. The demand that created the requirement was moved in to an earlier date (usually this occurs because APS switched the supply usage from a later demand to an earlier demand according to the Purchased Supply Switching logic). The purchase order is now needed earlier than when initially created. This exception message suggests that you change the PO's due date to match the earlier demand date. The system allocates this supply based on the assumption that you are going to move the purchase order as suggested, and it will NOT create additional planned purchase orders (PPOs) to cover the changing requirement. However, the system only suggests moving the due date to within the item's lead time. For example: Case 1 (10-day lead time) The current date is 6/1. Demand originally due on 6/19. The system creates a PPO on 6/19 to meet demand. You firm the PPO into a PO due on 6/19. The system switches the supply allocation to a demand due on 6/5. The Move In exception message is generated, suggesting you move in the PO's due date to 6/11 (current date + 10-day lead time = 6/11). Case 2 (2-day lead time) The current date is 6/1. Demand originally due on 6/19. The system creates a PPO on 6/19. You firm the PPO into a PO due on 6/19. The system switches the supply allocation to a demand due on 6/5. The Move In exception message is generated, suggesting you move in the PO's due date to 6/5.

Move In Rcpt (Tol): YYYY-MM-DD	The APS system used a receipt (such as a PO item) that is available later than the demand is due. The lateness was within the defined Supply Usage Tolerance. Move the receipt to the date specified in this exception message. If the system is applying this receipt to more than one demand, the move-in date shown is that of the earliest demand.
Move Out Rcpt: YYYY-MM-DD	If you are using MRP, the system determined that a job or PO receipt is needed later than the current due date; a reschedule date appears with the exception message. If you are using APS, this exception displays only when both the Purchased Supply Switching and the Generate Purchase Order Exceptions parameters are enabled. The demand that created the requirement was moved out to a later date. This message suggests the date you should move the purchase order's due date out to in response to the changing requirement. For example, an order requires a quantity of a purchased item on 06/01/2002. The customer calls and delays the order to being due on 06/10/2002. After running APS Planning, the system views the incoming supply as being available on 06/01/2002, even though the demand doesn't need it until 06/10/2002. This exception message suggests you move the purchase order out to 06/10/2002. The system assumes you are going to move the date of the purchase order or job as suggested.
On Hand Below Safety Stock	This exception displays when the initial projected or current on-hand amount of an item falls below its safety stock value (which is specified on the Item/Warehouse form). A PLN for safety stock replenishment is generated along with this exception message (see How Safety Stock is Replenished for more information).
Rcpt Not Needed	This message displays if the last receipt of an item can be dropped without the inventory level dropping below safety stock. It indicates the receipt that is no longer needed in order for the demand to be fulfilled. Remove the specified receipt. For job orders or production schedules for manufactured items, a maximum of one of these messages per item can display. For purchase orders, every receipt that is not needed will be represented with an individual exception message.
Release Order (MPS Item) YYYY-MM-DD	(Generated only by the MPS Processor, and displays only on the Master Planning Report.) The primary purpose of this message is to prompt you to firm an MPS receipt into a job or PO. This message appears for this reason when the calculated release date (due date - lead time) for the MPS receipt is earlier than the current date. The secondary purpose of this message is to prompt you to release a Firm job or Planned PO line (for an MPS item) that has a calculated release date earlier than the current date. The date indicated

in the message is simply the due date/end date and does not have any particular significance other than as a reference. You will receive this exception for any of these conditions:

PO line item with a status of "Planned" if: (PO line due date - DTS lead time - Paperwork lead time) < current date

Job or co-product job with status of "Firm" if: (job start date - DTS lead time - Paperwork lead time) < current date

MPS receipt if: (MPS due date - Fixed lead time - Variable lead time - DTS lead time - Paperwork lead time) < current date

Rcpt Projected Late (999) Days	In MRP mode, this message means the receipt's due date is earlier than the current date, which implies that it is late. In APS mode, this message can display when the receipt's projected completion date (calculated by APS) is later than the receipt's due date. The number of days the receipt is late is displayed with the message.
Rqmt Projected Late (999) Days	In MRP mode, this message means the parent requirement for this pegged supply has a due date earlier than the current date. In APS mode, this message can display when the pegged receipt's projected completion date (calculated by APS) is later than the parent requirement's due date. Or, the requirement's projected date is later than the requirement's due date. The number of days the requirement is late is displayed with the message.

Interpreting the Exceptions Report

This topic describes the details of the Exceptions Report output in its Detail and Summary view.

Detail Report

Outstanding Requirements

The outstanding requirements are the sum of three components:

- Forecast - The forecast amounts are the outstanding quantities for all forecasts entered for that period.
- Independent Demand - Independent demand quantities are determined by all customer orders and transfers for the current item with a due date in that period.
- Dependent Demand - Dependent demand quantities are the requirements from parent items, as planned orders are generated. Planned orders are the result of jobs or production schedules.

Outstanding Receipt

The outstanding receipt quantities are made up of purchase orders, purchase requisitions, firmed or released jobs, released production schedules, and transfers.

Original Quantity

The original quantity is the original suggested order quantity created by running the APS Planning or MRP Planning activity.

Parent Item Transaction

A parent item transaction is caused by a job, MPS order item, planned order or production schedule for the item's parent that has been exploded down to that item.

Reference

The reference identifies the source of the receipt or requirement that is due. The reference consists of three parts:

Part 1

The first part maintains a code that identifies the transaction type as a requirement or receipt.

Requirement Types:

- (Independent Demand)
- CO - Customer Order
- FCST - Forecast: The FCST shows the date of the forecast instead of a reference number in the reference field.
- TRNS - Transfer Shipment
- (Dependent Demand)
- PJOB - Parent Job: This transaction is caused by a job for the item's parent that has been exploded down to that item.
- PMPS - Parent Master Production Schedule: This transaction is caused by an MPS order for the item's parent that has been exploded down to that item.
- PPLN - Parent Planned Order: This transaction is caused by a planned order for the item's parent that has been exploded down to that item.
- PPS - Parent Production Schedule: This transaction is caused by a production schedule for the item's parent that has been exploded down to that item.

Receipt types:

- JOB - Job
- MPS - Master Production Schedule
- PLN - Planned Order
- PO - Purchase Order
- PREQ - Purchase Requisition

- PS - Production Schedule
- TRNR - Transfer Receipt

Part 2

The second part of the reference field is the CO number, job, and job suffix numbers, PO number, Production Schedule ID, purchase requisition number or transfer number.

Part 3

The third part of the reference field is the operation, if it is a job; or the line/release, if it is a CO or PO.

EXAMPLE: A Reference Code of CO 12 3-1 means that this item corresponds to customer order number 12, line/release 3-1. A Reference Code of PJOB 55-0001 10 means that this item corresponds to Job 55-0001, and Operation 10.

NOTE: You may also see the above reference with an X preceding it; for example, XPO. This situation indicates that it has been cross referenced. Other valid cross references are: XCO, XJOB, XPJOB, XPREQ and XTRNR.

Alternate Materials

NOTE: Alternate materials apply only to APS.

In the Detail view, this report displays any alternate materials used in the BOM. The word "Alternate" displays next to the material if the APS Planning activity used an alternate material on a planned order, and then you firmed that planned order into a job or production schedule item and copied the current routing/BOM. See the help topic for the Alternate check box that appears on the Planning Detail form for more information.

Summary Report

Outstanding requirements are the sum of three components:

- Forecast - The forecast amounts are the outstanding quantities for all forecasts that were entered for the period.
- Independent demand - Independent demand quantities are determined by all customer orders and transfers for the current item with a due date in the period.
- Dependent demand - Dependent demand quantities are the requirements from parent items, as planned orders are generated. Planned orders are the result of jobs or production schedules.

The scheduled receipt quantities are made up of purchase orders, purchase requisitions, firmed or released jobs, released production schedules, and transfers.

The on-hand quantity is the total gross quantity on hand for the item at all locations (minus the non-nettable stock).

The planned orders quantity is the original suggested order quantity created by running the MRP Planning or APS Planning activity.

Using Lot Sizes with MRP and APS

You can set up items to be produced in minimum and maximum "lot" quantities in a production run. The system considers the maximum lot size parameter (Order Maximum) before the minimum (Order Minimum) and multiple (Order Multiple) lot size parameters. All parameters described in this topic are located on the Planning tab on the Items or Multi-Site Items form.

The fields described in this topic apply only to MRP and APS planning. You define the lot size used for item costing in the Lot Size field.

Using Order Maximum

NOTE: This section applies to APS; MRP does not support Order Maximum.

Applying an Order Maximum value to an item allows you to load a demand across many resources to improve efficiency and speed. This parameter applies only to manufactured end items (that is, parent items but not their components). When planning a demand for an end item, the system breaks the order quantity into multiple loads of the size specified in the Order Maximum parameter. For example, if Order Maximum is 50, and the order quantity is 100, the system plans two loads, each with a quantity of 50. The system treats each load as a separate demand. For each load, at each level of the bill of material, the system considers planned supplies, inventory, scrap/shrinkage, and Order Minimum/Order Multiple.

The last load will contain the remainder of the original quantity. For example, if the Order Maximum value is 1000, and the order is for a quantity of 100,002, the system plans the order as if it were for 99 separate loads of 1000 items each and one load of 1002 items.

If you are not using planned order consolidation, the system creates a single planned order for each load created by the Order Maximum function. Also, if you view the demand detail on the Demand Detail Chart APS form, you will see the multiple loads. You may also view the individual loads on the Resource/Resource Group Gantt Chart APS form.

NOTES: If the Order Maximum value is less than the Order Minimum value, the system sets the load size equal to Order Minimum.

In some situations, if the parent item uses the Order Maximum parameter and its component items use the Order Minimum parameter, the system may generate unnecessary, excess planned supplies. If you encounter this situation, consider enabling the Manufactured Supply Switching parameter on the Planning Parameters form and on the Items record for the parent item.

Using Order Minimum/Multiple

The Order Minimum and Order Multiple parameters allow you to produce items in a minimum lot size and in a specific multiple. Minimum and multiple are lot sizes for manufactured items and are the supply order sizes recommended for purchased items. If the demand quantity is less than the Order Minimum, the system creates the planned order for the order minimum value. If the Order Minimum value is less than the demand quantity, the system adds Order Multiples to the Order Minimum value until the planned order quantity is greater than or equal to the demand quantity. A value of 0

indicates that the system does not enforce minimum or multiple. The table below shows some examples.

Order Min.	Order Mult.	Demand Qty	PLN Qty
1	50	1	1
3	50	1	3
3	50	10	53
1	50	50	51
50	50	50	50
50	50	51	100
0	50	51	100
0	50	10	50
10	0	8	10

NOTE: Other demands can use any leftover quantities created by Order Minimum/Order Multiple calculations.

Realize that the primary purpose of APS is to develop a plan for every order, building or acquiring only what is needed when it is needed (providing flexibility to react to customer changes). Using Order Minimum and Order Multiple when planning in APS mode may increase lead times, inventory levels, and commit the shop floor to build quantities that may not be needed.

About Phantom Items in MRP and APS

An item is a *phantom* when the Phantom Flag is selected on the Items form. When you run APS Planning or MRP Planning, the system bypasses the phantom item and creates planned orders only for the material components in the phantom item's current bill of material. This "blow-through" planning drives the demand straight through the phantom item to its components.

The MRP and APS systems plan phantom items differently depending on certain conditions. This topic describes these conditions and how you should control them.

If the Phantom is an End Item

Phantoms are usually subassemblies. However, if a phantom is the finished "end" item, the system plans it normally, generating any necessary planned orders for it along with the planned orders for its components.

Interaction with Accept Requirements and Pass Requirements Parameters

The system plans items differently based on the combination of how you set the Phantom Flag, Accept Requirements, and Pass Requirements fields on the Planning Parameters form. See the Accept Requirements help topic for details about the relationship between these three fields.

About Phantom Inventory Usage

This section applies only to APS; MRP does not allow you to use phantom inventory.

Typically, you do not stock a phantom, but it is possible to do so (for example, if you perform a Miscellaneous Receipt transaction for the phantom item). If a stocked quantity of a phantom is on hand, APS reduces the demand quantity for the phantom's material components by the amount of that stocked quantity.

> **EXAMPLE:** Consider the usage of the phantom item "Item-2" in this bill of material:
>
> ```
> Item-1
>   |
>   |____ Item-2 (phantom)
>             |
>             |____ Item-2a
>             |
>             |____ Item-2b
> ```
>
> - There is a customer order for Item-1 for a quantity of 20.
> - You have 5 of Item-2 on hand.
>
> When you run the APS Planning, the system generates a planned order normally for Item-1. But before it blows through the phantom Item-2 to plan its components, it first reduces the component demand quantity by Item-2's on-hand quantity of 5. So, instead of planning a demand of 20 for Item-2a and Item-2b, it plans for 15.
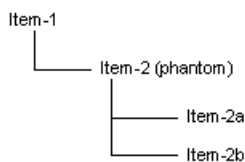
Adjusting the Production BOM for Phantom Inventory Usage

When you firm a planned order for an item that has a phantom in the current BOM, and the system uses the phantom's inventory to reduce the component demand, the phantom item is NOT added to the production BOM for the resulting job or production schedule. Instead, the Planned Phantom Usage form appears and prompts you to add the phantom item to the job or production schedule; this gives you control over whether to add the phantom to the production BOM. You can add the phantom to the production BOM or not, depending on your company's processes.

If you want the phantom to be used in the production BOM, you must add it as a material on the job or production schedule BOM. After adding the phantom to the BOM, you must reduce the demand quantity by adjusting the Qty/Per field for the phantom and its components. The example below describes how to do this.

EXAMPLE: Consider this current routing/BOM:

```
Item-1
    |
    |------- Item-2 (phantom)
                    |
                    |------- Item-2a
                    |
                    |------- Item-2b
```
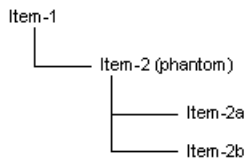
- There is a customer order for Item-1 for a quantity of 8.
- You have 4 of Item-2 on hand.
- Item-2, Item-2a, and Item-2b are all defined with Qty/Per values of 1 per unit.

To adjust the production BOM for this example, follow these steps:

1   Run APS Planning.

   a   The system creates a planned order for Item-1 for a quantity of 8.

   b   Because it uses the 4 on-hand of the phantom, the system creates planned orders for Item-2a and Item-2b for a quantity of 4.

2   Open the Planning Detail form and firm the planned order for Item-1. When prompted, choose to copy the current BOM.

   NOTE: If you do not plan to adjust the BOM for phantom usage after firming the planned order, you should not firm the planned orders for the phantom's component materials (Item-2a and Item-2b). Otherwise, it would be OK to do so.

3   The **Planned Phantom Usage** form opens and displays this message:

   The Planner has suggested adding phantom item [Item: Item-2] for [Quantity: 4.00000000] to Job that has [Job: 163] and [Suffix: 0] and [Operation: 10].

Open the Job Materials form and filter to the BOM record for Item-1.

Add Item-2 as a material of Item-1 and change Item-2's **Qty/Per** value to **0.5**. This value reduces the demand quantity of the phantom from 8 to 4.

Filter to the BOM record for Item-2. For each of this phantom's materials (Item-2a and Item-2b), change the **Qty/Per** field to **0.5**. This value reduces the demand quantity of the phantom's materials from 8 to 4.

MRP Planning

Differences in MRP from PROGRESS to SQL versions

In general, MRP in the SQL version is much the same as in the PROGRESS version. However, some changes were necessary due to the functional differences between the two. This topic lists the differences.

MRP Algorithm in SQL version

The planning algorithm used by MRP in the SQL version is almost identical to the algorithm used in the PROGRESS version. MRP in the SQL version plans requirements in order by the lowest level in which the item appears in all current, job, and production schedule bills of material. That is, it plans all end items first, then all items at the next level, and so on, backward planning each requirement from the requirement's needed date to the item's lead time, batching together requirements needed at the same period of time. MRP in the SQL version generates planned orders and exception messages to help you implement an accurate plan.

MRP Business Process

Your process for using MRP should not change significantly in the SQL version. As in the PROGRESS version's MRP, you must still run the Current Bill of Material Processor and Job and PS Bill of Material Processor before running an MRP generation to ensure the low-level codes are correct.

The SQL version also offers these MRP features found in the PROGRESS version:

- Use the Lead Time Processor to calculate manufactured-item lead times from the time values defined on the routings.
- Use the Material Planner Workbench or Order Action Report to view suggested release dates for your planned orders.
- Use the Material Planner Workbench or Planning Detail form to view exception messages and firm planned orders into jobs, production schedules, etc.

You can run MRP in Net Change or Regeneration mode. As in the PROGRESS version, Net Change mode plans only those items for which on-hand, supply, or requirements information has changed since the last MRP run (as tracked via the Net Change field on the item record). When you make a change to an item's on-hand, supply, or requirements information, the Net Change field on that item record is selected automatically and that item will be included in the next Net Change MRP run, just as in the PROGRESS version. Running MRP in Regeneration mode plans all items in the database.

The remaining sections in this topic list the differences in specific forms, fields, and other assorted differences. In some cases, there is not a direct mapping from a PROGRESS version form or field to an equivalent SQL version concept; however, in most cases, there is some replacement concept.

The tables below list only those screens/forms/parameters that are titled differently in the SQL version or are handled through some other function. If the form still exists in the SQL version under

the same name as in the PROGRESS version (such as the Material Planner Workbench), it is not listed.

Form/Screen Differences

PROGRESS Screen	SQL Equivalent
Planning Detail Display	Planning Detail form
MRP Generation	MRP Planning form
MRP Order Action Report	Order Action Report
Rough Cut Capacity Planning screen	(RCCP not brought forward to SQL)
Resource Master	(user-defined resources not brought forward to SQL)
Items with Net Change Flag Set Report	Filter on Net Change field on Items form to get list of items with Net Change field set.
Load Planned Orders utility	Use the Schedule Planned Orders parameter on the Shop Floor Control Parameters form

Parameter Differences

PROGRESS Parameter	PROGRESS Screen	SQL Parameter	SQL Form
Mfg and PO Online Planning Parameters	Planning Parameters	(not brought forward to SQL)	n/a
CO and Forecast Online	Planning Parameters	(not brought forward, but this function is supported through the SQL database structure inherently)	n/a
Transfers Online	Planning Parameters	(not brought forward, but this function is supported through the SQL replication functionality)	n/a

Whse Considered For	Planning Parameters	Dedicated Inventory (see About Warehouses for detailed information about how this field is used in MRP planning)	Warehouses
Post Planned TOs	Planning Parameters	(not brought forward, but this function is supported through the SQL replication functionality)	n/a
Use JIT Scheduling	Planning Parameters	Plan Materials at Operation Start	Planning Parameters
Use Dynamic Lead Time	Planning Parameters	Use Scheduled Times in Planning	Planning Parameters
Multi-site Group ID	Planning Parameters	(not brought forward, but this function is supported through the SQL replication functionality)	n/a
MRP End Date	Job Orders	The closest equivalent is the job's Projected date. See help topic titled "About Job Dates" for detailed information about how this field is used in MRP planning.	Job Orders

Exception Message Differences

PROGRESS Exception Message	SQL Exception Message
Reschedule Receipt	Move In Receipt
	Move Out Receipt
Sched. Receipt Not Needed	Receipt Not Needed
Sched. Receipt Past Due	Rcpt Projected Late
Sched. Reqmt Past Due	Rqmt Projected Late

Switching from APS Mode to MRP Mode

This topic describes the steps you should perform when you have been running APS Planning and you want to switch to MRP Planning. The APS Planning function uses a Windows service (the Planning and Scheduling Gateway Service) and a special memory-resident database (the "planner database") that should be closed before you run MRP Planning.

NOTES:

- These steps are recommended only if you are making a long-term change to MRP Planning. If you are planning to switch back and forth between the two modes, do not perform these steps.
- If, after performing the steps in this topic, you want to switch back to APS Planning, you must restart the planner database and Gateway service as described in the *Installation Guide*.

Step 1: Remove the Planning and Scheduling Gateway Service

The Planning and Scheduling Gateway Service periodically runs the Gateway Processor, which reads the ERDBGW table in the SQL database and copies the data to the corresponding tables in the planner database, keeping the two databases synchronized. The APS planning function uses the data in the planner database. MRP does not use this service, so you can stop it to avoid unnecessary processing.

On the Infor CloudSuite utility server, perform these steps:

1   Open the Gateway Service Configuration utility (Start > Programs > Infor > Setup > Gateway Service Configuration).

2   Click the Remove Service button.

3   When asked for confirmation that you want to remove the service, select Yes.

Step 2: Stop the Planner Database

The planner database resides in the server's memory. The APS calculations run against this database; MRP does not use it.

Perform these steps on the Infor CloudSuite Planning server:

1   Open the Planner Manager (Start > Programs > Infor > Tools > Planner Manager).

2   In the Databases list, select the planner database to stop (if you have more than one, you will repeat these steps for each database).

3   Click the Stop button. The Specify Stop Parameters dialog displays.

4   Click Stop.

At this point, you can select the **Use MRP Planning** field on the MRP Mode form to switch to the MRP planning mode.

MRP Overview

Material Requirements Planning (MRP) is a mode of planning that plans requirements in order by the lowest level in which the item appears in a bill of material. That is, it plans all end items first, then all items at the next level, and so on, backward planning each requirement from the requirement's needed date to the item's lead time and batching together requirements needed at the same period of time.

Unlike APS, MRP does not consider routing times, resource capacity, or shifts. The responsibility rests with you, the planner, to make sure your shop floor has the available capacity to work the plan. MRP generates planned orders and exception messages to help you implement an accurate plan.

Information MRP Uses to Plan

Low-level Codes and Bills of Material

Each item has a low-level code that represents the lowest level at which the item appears in all current, job, and production schedule bills of material (BOMs). An end item always has a low-level code of 0. Items in the next level of the BOM have a low-level code of 1, the next level is 2, and so on. MRP processes items in order by low-level code, and processes an item only at its lowest-level code. You should update the low-level codes by running the Current Bill of Material Processor and the Job and PS Bill of Material Processor before you run MRP. See the Low-level Code field help topic for more information.

Routings

MRP does not directly factor operation duration times into its planning logic. However, when planning released jobs, it does use the start date of each operation to backward plan the materials required at the operation if the Plan Materials at Operation Start field is selected on the Planning Parameters form.

Also, if you use the Lead Time Processor to generate lead times for manufactured items, the operation's Run Duration, Move, Queue, Setup, and Finish times will be used in calculating lead time. Therefore, accurate information in your routings is important for successful MRP planning.

Item Lead Times

MRP uses the item lead time to determine the due dates on planned orders it creates to satisfy requirements, planning backward in time from the date the item is needed. Typically, you use the Lead Time Processor to generate the lead time for manufactured items automatically from information including the item routing's move, queue, setup, duration, and finish times and the average hours in a work day.

On-hand Inventory and Receipts

MRP calculates the on-hand inventory quantity at the beginning of the process as the total on-hand quantity (that is, on-hand - Qty Reserved for customer orders) at all nettable stockroom locations

across all NON dedicated-inventory warehouses at the site. A dedicated-inventory warehouse has the Dedicated Inventory field selected on the Warehouses form.

Receipts (also called "planned supplies") include expected incoming quantities from jobs, production schedule releases, MPS receipts, purchase orders, and transfer orders. If the planning parameter Check PO Requisitions is selected, purchase requisitions are also considered as receipts.

The system considers on-hand inventory and receipts in determining the net requirements for an item.

Transit locations must always be non-nettable for site-to-site transfers. Cross-site transfers show up as receipts in the To Site, so the transit location has to be non-nettable so that the quantity isn't considered twice by MRP; in the beginning projected on hand and as a receipt.

When performing warehouse-to-warehouse transfers within a site, the transit location used by those must be nettable.

Independent Requirements

An independent requirement is a demand for an item that does not originate from another requirement. Forecasts, customer orders, and demand transfer orders are independent requirements. MRP starts by planning independent requirements and generates "dependent requirements" for the next levels in the item's BOM.

Master Production Schedule

The master production schedule (MPS) allows you to control production of key end items to help you protect your schedule from fluctuations in order-based demand (forecasts, customer orders, parent job orders, etc.). MPS is a manually created, anticipated build schedule for an item. You create it based on your expectations of demand and your estimation of resource capacity.

When you run the MPS Processor, planned orders are created for MPS item requirements that are due outside the MPS plan fence, but not for the components in the MPS item's bill of material. When you run MRP after running MPS, MRP does not create planned orders for the MPS end item, but does pass those requirements down to the components in the MPS item BOM, creating PLNs for the components.

Information MRP Generates

The output of an MRP process includes planned orders and exception messages.

Planned Orders

When you run an MRP process, the system generates planned orders (PLNs), as illustrated in the example below. PLNs represent MRP's suggestions of how you can manufacture or purchase the item to satisfy the requirements. A PLN is not tied to a particular requirement.

You must examine each PLN and firm it into a real job order, purchase order, transfer order, etc., as you deem appropriate. The item's Source field (as defined on the Items form) determines what type

of receipt the PLN will firm into (Manufactured=job order; Purchased=PO; Transferred=transfer order). You can firm PLNs on the Planning Detail form or on the Material Planner Workbench.

NOTE: On the Shop Floor Control Parameters form, you can select the Schedule Planned Orders field to specify that the Scheduler consider the MRP planned orders as demands that must allocate resources (thus creating a more realistic scheduling simulation).

Exception Messages

When certain situations occur within the MRP process, such as when the on-hand quantity drops below safety stock, or when a planned receipt is no longer needed (or needs to be moved in or out in time), the system generates a warning/informational alert called an exception message. You must review these messages and take the appropriate action. You can review exception messages on the Planning Detail form or on the Material Planner Workbench. See About Exception Messages for a description of each message that may be generated.

Reports

After running MRP, you can use the Material Planner Workbench or the Order Action Report to determine the job orders and purchase orders you must generate and release for a given item to be available when needed. Use the Exceptions Report to print a list of all items for which MRP generated exceptions. This is basically the same information you can view on the Planning Detail or Material Planner Workbench forms, but may be easier to use as a tool for responding to the exceptions.

Multi-Site MRP Planning

The system can replicate MRP planned transfer orders to the supply sites in your multi-site environment.

You must set up replication rules to allow a supply site to "see" any demands coming from the site that initiated the MRP process. See Setting Up Planned Transfer Order Replication for more information.

Steps and Daily Procedures

See MRP Steps for the general MRP business process and related procedures.

Comparison with APS

APS is an alternative planning mode also available in Infor CloudSuite. Unlike MRP, APS considers resource capacity and shifts when planning a demand. Also, APS plans demands by order priority, completely planning a single demand through its entire BOM before determining whether capacity is available to plan the next demand. APS is a more accurate and realistic planning method than MRP; however, it may require more thought about how to set a variety of additional planning parameters. APS also requires you to provide accurate routing information to achieve an accurate plan. SeeAPS Overview for more information about the APS planning mode.

Example MRP Plan of a Bicycle End Item

To understand the planning process MRP uses to satisfy requirements for an item, consider a simple BOM for manufacturing a bicycle. In this example, we have an end item Bike that is made from a Frame subassembly, a Wheel subassembly (2-per), Grips (2-per), and a Seat subassembly. In the graphical representation below, the number in parentheses represents the low-level code for each level in the BOM.

```
Bike (0)
├FrameAssy (1)
│  ├Chain (2)
│  └Sprocket (2)
├WheelAssy (1)
│  ├Tire (2)
│  ├Hub (2)
│  └Spokes (2)
├Grips (1)
└SeatAssy (1)
   ├Clamp (2)
   ├Bolt (2)
   └Shaft (2)
```
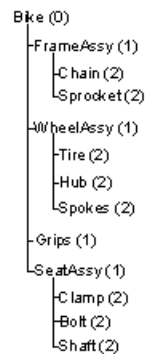
Example MRP Input Data

For this example, assume this starting data:

- Fixed Lead Time for Bike: 3 days
- Current date is 4/5
- On-hand inventory for Bike: 50
- Safety stock for Bike: 20
- Forecast for Bike: 500, due 4/11 (for this example, we will assume this date is within the Forecast Look Behind/Look Ahead window)
- Customer order: 200, due 4/20
- Purchase order for Grips: 500, due 4/6

When you run MRP Planning, the system performs the entire process for one end item (and all other end items) before moving on to the next level in the BOM. The system plans all items with low-level code 0, in order by due date, and then plans items with low-level code 1, and then low-level code 2, and so on, until all levels of low-level coding are planned. For simplicity in this example, we will observe the process only for low-level codes 0 and 1.

Processing Low-level Code 0 (End Item)

1 Compare forecasts for the item to customer orders to determine the true net requirements. In this example, the forecast has an original quantity of 500. The single customer order in this example (quantity of 200) "consumes" that requirement down to 300. MRP will use this quantity as one of the independent requirements to plan.

2 Create independent requirements for the end item:

- Forecast: 300

- Customer Order: 200

NOTE: This example includes only a single customer order and a forecast; however, other demands, such as job orders, transfer orders, and project resources, would be considered as well.

3 Calculate beginning balance on-hand. For this example, on hand is 50.

4 If beginning on-hand is below safety stock (for this example, it is not):

- Generate On Hand Below Safety Stock exception message.
- Search for planned receipts (jobs, POs, etc.), within the Job Reschedule time fence or PO Reschedule time fence, to cover the safety stock and generate the appropriate exception message (Move In Rcpt/Move Out Rcpt as appropriate). If planned receipts do not cover safety stock, generate a PLN due on the date the on-hand went below safety stock.

5 Process all requirements for the item. For each requirement, deduct the order quantity from balance on-hand. If the requirement is a forecast, and the Use CO or Forecast parameter is set to Forecast, deduct the full forecast quantity from balance on-hand. If the parameter is set to Both, deduct only the Outstanding Quantity (that is, the quantity not consumed by customer orders) from balance on-hand.

After deducting the requirement quantity from on-hand, if on-hand is below safety stock:

- Generate On Hand Below Safety Stock exception message.
- Search for planned receipts (jobs, POs, etc.) within the reschedule time fence to cover safety stock. If necessary, generate the appropriate exception message. If existing receipts do not cover safety stock, generate a PLN to cover safety stock and the unsatisfied requirement. The system considers the PLN as a placeholder receipt that you will later "firm" into a job, purchase order, etc. In this example, there are no existing receipts to use, so the system creates two PLNs: one to represent the quantity of the forecast (plus the quantity needed to cover safety stock) and one to satisfy the customer order:
    o PLN 1: 270 (net of 300 forecasted quantity - 50 on hand + 20 to cover safety stock), due 4/11
    o PLN 2: 200 (to cover customer order), due 4/20

On the Planning Detail form, the plan for the Bike item would look something like this:

	Item	Date	Projected On Hand	Outstanding Receipt	Outstanding Requirement	Exception Message	Reference	Parent Item
1 >>	Bike		50.000	0.000	0.000		BALANCE ON HAND	
2	Bike	4/11/2005	320.000	270.000	0.000		PLN 1	
3	Bike	4/11/2005	20.000	0.000	300.000		FCST 2005-04-10	
4	Bike	4/20/2005	220.000	200.000	0.000		PLN 2	
5	Bike	4/20/2005	20.000	0.000	200.000		CO 160 1	

NOTE: Depending on the due dates of the demands and the setting of the Days Supply field for the item, these PLNs may be consolidated into a single PLN with a quantity of 470.

6 Pass PLNs for this item down to the component materials in the next level of the BOM. This step "explodes" the requirements for this item down to the next level of the BOM to create the "dependent requirements" for the components.

- Pass any PLNs created/updated in the previous step to the current BOM, creating "parent planned orders" (PPLN requirements) for the appropriate components. In this example, the system creates these PPLN requirements:

Component	Requirements	Due Date
FrameAssy	PPLN 1: 270	4/7
	PPLN 2: 200	4/15
WheelAssy	PPLN 1: 540	4/7
	PPLN 2: 400	4/15
Grips	PPLN 1: 540	4/7
	PPLN 2: 400	4/15
SeatAssy	PPLN 1: 270	4/7
	PPLN 2: 200	4/15

NOTE: The component requirements' due dates reflect the parent requirement's due date minus the end item's lead time, counting only manufacturing days as defined by the MDAY calendar.

- Pass any job receipts identified in step 5 to the job BOM (if it exists; otherwise pass to the current BOM), creating parent job requirements (PJOB requirements) for the appropriate components. In this example, there were no job receipts for the end item.

- Pass any production schedule receipts to the production schedule BOM (if it exists; otherwise pass to the current BOM), creating parent production schedule requirements (PPS records) for the appropriate components. In this example, there were no PS receipts for the end item.

7 Repeat the above steps to plan the next item. If this is the last item with low-level code 0, move on to planning the items with low-level code 1.

Processing Low-level Code 1 Items

For simplicity, the following process is summarized for all low-level code 1 items; in the system, the steps would be repeated for each low-level code 1 item individually.

1 Compare forecasts for the item to customer orders to determine the true net requirements. In this example, there are no forecasts for any of the low-level code 1 items.

2 Create requirements for the item. Requirements for items in the bill of material were passed down from the end item. For this example, the following requirements were passed:

Component	Requirements	Due Date
FrameAssy	PPLN 1: 270	4/7
	PPLN 2: 200	4/15
WheelAssy	PPLN 1: 540	4/7
	PPLN 2: 400	4/15
Grips	PPLN 1: 540	4/7
	PPLN 2: 400	4/15
SeatAssy	PPLN 1: 270	4/7
	PPLN 2: 200	4/15

3 Calculate beginning balance on-hand. For this example, there is no available on-hand inventory for any of the components.

4 If beginning on hand is below safety stock, generate exception messages and safety stock PLNs as described above in the *Processing Low Level Code 0* section.

5 Process requirements for the item, as described above in the *Processing Low Level Code 0* section. Create PLNs to satisfy each unsatisfied requirement:

Component	Requirements	Resulting PLN
FrameAssy	PPLN 1: 270	PLN 3: 270
	PPLN 2: 200	PLN 4: 200
WheelAssy	PPLN 1: 540	PLN 5: 540
	PPLN 2: 400	PLN 6: 400
Grips	PPLN 1: 540	PLN 7: 40
	PPLN 2: 400	PLN 8: 400
SeatAssy	PPLN 1: 270	PLN 9: 270
	PPLN 2: 200	PLN 10: 200

NOTE: For the Grips component, PLN 7 is only for 40 because the purchase order for 500 satisfies 500 of the PPLN requirement.

6   On the Planning Detail form, the plan for the FrameAssy item would look something like this:

	Item	Date	Projected On Hand	Outstanding Receipt	Outstanding Requirement	Exception Message	Reference	Parent Item
1 >>	FrameAssy		0.000	0.000	0.000		BALANCE ON HAND	
2	FrameAssy	4/7/2005	270.000	270.000	0.000		PLN 3	
3	FrameAssy	4/7/2005	0.000	0.000	270.000		PPLN 1	Bike
4	FrameAssy	4/15/2005	200.000	200.000	0.000		PLN 4	
5	FrameAssy	4/15/2005	0.000	0.000	200.000		PPLN 2	Bike

7   The plan for the Grips component would look something like this:

	Item	Date	Projected On Hand	Outstanding Receipt	Outstanding Requirement	Exception Message	Reference	Parent Item
1 >>	Grips		0.000	0.000	0.000		BALANCE ON HAND	
2	Grips	4/6/2005	500.000	500.000	0.000		PO 6 2	
3	Grips	4/7/2005	540.000	40.000	0.000		PLN 7	
4	Grips	4/7/2005	0.000	0.000	540.000		PPLN 1	Bike
5	Grips	4/15/2005	400.000	400.000	0.000		PLN 8	
6	Grips	4/15/2005	0.000	0.000	400.000		PPLN 2	Bike

8   Pass PLNs for this item down to the component materials in the next level of the BOM. This step "explodes" the requirements for this item down through the BOM to create the "dependent requirements" for the components.

- Pass any PLNs created/updated in the previous step to the current BOM, creating "parent planned orders" (PPLN requirements) for the appropriate components. In this example, the system passes PPLN requirements down to the low-level code 2 components.

- Pass any job receipts identified in the previous step to the job BOM (if it exists; otherwise pass to the current BOM), creating parent job requirements (PJOB requirements) for the appropriate components. In this example, there were no job receipts for any components.

- Pass any production schedule receipts to the production schedule BOM (if it exists; otherwise pass to the current BOM), creating parent production schedule requirements (PPS records) for the appropriate components. In this example, there was a production schedule for the Grips item, but the Grips item has no components.

9   Repeat the above steps to plan the next item. If this is the last item with low-level code 1, move on to planning the items with low-level code 2.

MRP Steps

This topic describes three categories of steps associated with MRP planning:

- initial setup tasks
- periodic maintenance tasks
- routine, day-to-day procedures

Initial Setup Steps

1 Select the **Use MRP Planning** field on the MRP Mode form to enable the MRP planning mode.

   NOTE: If you had been using the APS or Infinite APS planning mode, you must perform some preparatory steps before enabling MRP mode. See Switching from APS Mode to MRP Mode for more information.

2 Specify the Planning Parameters for your MRP system.

Maintenance Tasks

Perform these tasks on a regular or periodic basis to maintain your production data for planning.

- Define planning options for your Items. Options on the Planning tabs on the Items form determine how MRP handles each inventory item.
- Define lead times for purchased items.
- Create work centers for tracking operation costs.
- Create the current routing/BOM for each of your items.
- Create the Planning Horizon Calendar to specify the time periods for organizing the output data on the Planning Summary Display, Master Planning Display, and Master Planning Report.
- Enter forecasts for items.
- Make sure item low-level codes are correct. Check each item's low level code on the General tab on the Items form. Run the Current Bill of Material Processor and then the Job and PS Bill of Material Processor to update the low-level codes.
- Create production schedules, jobs, purchase orders, customer orders, and transfer orders to represent demand on the MRP plan.
- Create a master production schedule for items for which you want to control end-item requirements separately (usually high-cost items).

Routine Steps

You can place some of these tasks on the Background Queue to be run nightly, when few or no users will be saving changes to records that are included in the plan and schedule. See Background Queues for more information.

1 Run the Scheduling activity using a Days to Schedule value that is as far into the future as your longest job's processing time. This horizon avoids problems with planning operations for partially

scheduled jobs (that is, jobs with operations that have dates outside the Days to Schedule horizon).

2   Run Lead Time Processor

3   Run Current Bill of Material Processor.

4   Run Job and PS Bill of Material Processor.

5   Run the MPS Processor.

6   Run MRP Planning.

7   Respond to the exception messages that display on the Material Planner Workbench, Exceptions Report, or Planning Detail form.

8   Use the Material Planner Workbench or the Order Action Report to determine when you must generate and release a job order or purchase order to ensure that an item is available when needed.

9   Firm planned orders on the Material Planner Workbench form or on the Planning Detail form.

Running MRP Planning

Follow these steps to run the MRP plan, which deletes the existing plan and recreates it using the latest requirements, receipts, and on-hand inventory information.

1   Navigate to the MRP Planning form.

You must have enabled MRP Mode before you can open this form.

NOTE: Run this activity only at times when no other users will be saving changes to records that are included in the plan. You can run it on a recurring basis by scheduling it on the Background Queue. For more information, see Scheduling Reports and Utilities to Run in the Background.

2   Select whether to regenerate the entire MRP plan for all items (**Regeneration**) or only for those items for which MRP requirements, receipts, or on-hand information has changed (**Net Change**).

3   To start the MRP Planning activity, click **Plan**.

The system displays the message: **Task Submitted**.

4   To find out if the process completed successfully, open the Background Tasks form.

If the planning task appears in the list with a **Return Status** of **0** (**Complete**), the task completed successfully.

5   (Optional) When the process is finished, you can firm the new planned orders and view the exception messages using the Planning Detail form or the Material Planner Workbench.

Troubleshooting MRP

You may encounter the following error messages when running MRP Planning or performing related activities. Error messages for the MRP Planning activity appear on the Background Task History

form. Other errors may appear in a message box when you save a record. You should be able to diagnose and fix these errors using the solutions described below.

If a documented solution does not fix the problem, contact Infor Technical Support.

Error Message	Explanation and Solution
At least one Item exists where Include In Net Change Generation is equal to Yes.	In most cases, this error indicates that an item's low-level codes are set incorrectly. To find out which item has an incorrect low-level code, open the Items form and filter on the Net Change field. The item for which the Net Change field is selected has a low-level code problem in its BOM. In some other cases, this error can accompany the other errors (described below) related to blank dates.
Due Date is (blank).	A cross-referenced purchase requisition line item or PO line item has a blank Due Date.
End is (blank).	A cross-referenced job has a blank End Date and Projected date.
Manufacturing Day that has [Date: month, day, year] does not exist.	The projected due date for a requirement is earlier than the first manufacturing date in the MDAY calendar.
Sch Rcpt Date is (blank).	A cross-referenced transfer order line item has a blank Receipt Date.
Unable to perform update, record has been deleted or modified by another user. Include In Net Change Generation is No for Item that has [item number].	When the system tried to set the Net Change field for an item (because a change had been made to its MRP requirements or receipts), another user had that item record locked. Run MRP Planning with the Regeneration option to update this item or select its Net Change field manually.

APS Planning

APS Overview

The Advanced Planning System (APS) generates real-time projections of when you can complete orders by comparing all demands (such as customer orders) against a long-term plan.

The system views the current status of inventory levels, forecasts, job schedules, PO due dates, customer orders, etc. and creates *planned orders* accordingly to satisfy the demands. You then "firm" the planned orders into purchase orders, purchase requisitions, job orders, production schedules, or transfer orders.

The long-term plan includes information such as:

- Demand orders that consume inventory and resource capacity
- Supply orders that add to inventory
- Each operation in the plan
- Each item in the plan
- The projected completion date for every planned order
- Each resource allocated to a job
- Scheduled operations (for work orders in which the resource usage is frozen)
- Every lateness cause for every demand in the plan

Modes of APS Planning

Infinite APS vs. APS

You can run the planning system in Infinite APS mode or APS mode. The difference between these modes of planning is in the resource capacity the system considers when generating a plan. Infinite APS assumes infinite resource capacity, while APS constrains the plan realistically based on availability of resources.

- APS mode considers whether the crew and machines are on-shift and not busy working on another demand. In APS, resources are capable of working on a limited number of tasks while on shift. In APS mode, the Get CTP button is available on various forms such as Customer Order Lines and Job Orders.
- Infinite APS mode uses the sum of the Move, Queue, Setup, Run, and Finish times defined for the operations and assumes the resources are capable of working on an unlimited number of tasks while on shift. In Infinite APS mode, the Get ATP button is available rather than the Get CTP button.

See Resource Planning Examples for an illustration of how Infinite APS and APS plan resources for the same order data.

See About the APS Planning Process for a detailed discussion of how the APS algorithm plans demands into available supplies, on-hand inventory, and resource capacity.

NOTE: If the APS module is unlicensed, APS Planning can only be run in Infinite mode.

MRP vs. APS

Material Requirements Planning(MRP) plans requirements for items according to the level the item appears in a BOM, batching together requirements needed at the same period of time. Like APS, MRP generates planned orders, which you firm into actual Infor CloudSuite transactions.

MRP and APS use the same basic input data. However, the APS system plans all requirements for one demand (through the end item's entire BOM), then plans all requirements for the next demand, and so forth for all the demands, based on order priority and each demand's due date.

Examples of APS differences from MRP are as follows:

- APS "pull-plans" each demand backward in time, starting from the due date, to determine the start dates for the planned orders. If any single component from the demand cannot be pull planned within the time between the due date and the current date, the system "push-plans" the entire demand forward in time, starting from the current date, out to an as-soon-as-possible date. APS never plans into the past (unlike MRP, which allows start dates in the past).

- APS does not automatically combine planned orders for items that are needed within the same period of time. You can set the Planned Orders Consolidation options on the Advanced tab of the Planning Parameters form if you want planned orders to be combined, such as for a "days supply." See Consolidating Planned Orders for more information.

- APS does not always recommend moving a job to an earlier date to satisfy a demand. Instead, it creates a new planned order due earlier than the existing firmed job. However, if the supply is available within the Supply Usage Tolerance, the system will use the supply when the demand needs it. This behavior is appropriate in a finite capacity environment because you may be able to feasibly fit in a small job for a small order in situations where a larger job could not be moved.

Setup Steps and Daily Procedures

- See the *Installation Guide* for installation and setup procedures related to APS.
- See APS Steps for the general business process and related procedures.

Methods of Planning

You run APS in the following situations:

- APS Planning form: When you initially set up the system, and then on a scheduled basis (such as nightly), you run APS Planning to synchronize all demands with the latest inventory, supply, shifts, and resources information. You can run APS Planning for a single site or globally across all sites defined on the APS Sites and Alternate Management form. You can also set up the system to replicate demand transfer orders to your supply sites.

  The system deletes all existing plan information and regenerates it using the latest data. In most situations, you will run APS Planning for a long horizon, such as one or two months. (If you are using Scheduling, you will likely run the Scheduler with a shorter horizon, such as one or two days.) The APS Planning activity creates planned orders and exception messages.

- Incremental planning: When you save certain types of transactions (such as customer orders and job orders), AND the Plan on Save field is selected on the transaction, Infor CloudSuite inserts the new demand into the existing APS plan. The demand is planned using the inventory, supplies, and capacity that were not allocated to other demands during the last run of APS Planning or by demands that were previously incrementally planned. See About Incremental Planning and ATP/CTP for more information.

- Get ATP/CTP: For certain transaction types, the system can insert a single demand/line item into a temporary "test" copy of the plan to determine feasibility. In Infinite APS mode, the resulting

availability date is referred to as the available-to-promise (ATP) date. In APS mode, it is the capable-to-promise (CTP) date. The ATP/CTP process returns a projected availability date for the demand; if the date is acceptable, you can allow the system to insert the demand incrementally into the actual plan.

Planned Orders and Interaction with the Scheduler

When you run APS Planning, the system creates planned orders for demands that were not satisfied by on-hand inventory and planned supplies. On the Shop Floor Control Parameters form, you can specify that the Scheduler consider these planned orders as demands that must allocate resources (thus creating a more realistic scheduling simulation).

After you firm the planned order into a job, purchase order, etc., you can run APS Planning again to plan the new demand (using its routing/BOM). When you then run the Scheduler, the operation start and end dates are based on the dates APS calculated for the original planned order (the operation start and end dates may change depending on the rules set up for the Scheduler). Subsequent runs of APS Planning will treat those scheduled operations as "frozen," and will not move the operation start and end dates. However, subsequent runs of the Scheduler may move the operation start and end dates again based on the latest information.

APS Steps

This topic describes three categories of steps associated with APS planning:

- Initial setup tasks
- Periodic maintenance tasks
- Routine, day-to-day procedures

Initial Setup Steps

Your system administrator or installation consultant might have already performed these initial setup steps. In some cases, these steps must be repeated periodically. For details, see the *Installation Guide*.

1 Use the Planner Manager utility to start the Planner Database Manager and create at least one planner database.
To start the Planner Manager, on the utility server, select
Start > Programs > Infor > Planner Manager.
For instructions to create planner databases, see the Planner Manager online help or the *Installation Guide*.

2 Specify the planning parameters for your APS system. Perform these steps:

- Set up the production alternative (required).
- Enter a site record for the local site (required if you will be using APS or the Scheduler).
- Enter a site record for each of your supply sites that provide component parts to this site (required if you will be running APS Planning in Global mode).
- Define options located on the **General** and **Advanced** tabs.

3 Select the appropriate **Operation Scheduling** option on the Shop Floor Control Parameters form.

This parameter controls whether job operations are planned and scheduled by the number of pieces remaining to be completed or by the number of hours remaining to be performed.

4 If you are not using global planning, to replicate transfer orders to your supply sites, set up transfer order replication. If you are using global planning, but some sites are not participating in global planning runs, set up transfer order replication for those sites.

Maintenance Tasks

Perform these tasks on a regular or periodic basis to maintain your production data for planning.

- For the users that will perform the Get ATP/CTP function on transactions such as customer orders, job orders, forecasts, estimates, and so on, assign their user IDs to the user group that provides the appropriate permissions.

  The **APS - Set Due Date &LT Projected** and **APS - Override Projected Date** user groups allow the user to override the calculated availability date and enter an earlier date with which to plan the demand. For more information, see Availability Results.

- Define planning options for your items.

  Options on the **Planning** and **Additional Planning** tabs of the **Items** form determine how APS handles each inventory item.

- If you want APS to consider more than two decimal places in quantity values, specify the number of decimal places in the **Planning Precision** field for each unit of measure code you are using.

- Define lead times for purchased items.

- Set up lead time shifts to represent business days for purchased items.

  NOTE: If you do not do this, lead times assume 24-hour days and seven-day weeks.

- To define the available working times your resources can process operations, set up scheduling shifts.

  A default shift is predefined.

- Create work centers for tracking operation costs.

- Create resource groups and resources for performing the operations.

- Create the current routing/BOM for each of your items.

  Specify one or more resource groups on each operation in the routing. When you create a job, you can copy the current routing/BOM to the job (it serves as a template for the job routing/BOM).

- To specify the time periods for organizing the output data on the **Planning Summary Display**, **Master Planning Display**, and **Master Planning Report**, create the Planning Horizon Calendar.

- Enter forecasts for items.

- Make sure item low-level codes are correct. To update the low-level codes, run the **Current Bill of Material Processor** and **Job and PS Bill of Material Processor**.

- To group items that are authorized to be manufactured, create production schedules.

- Production schedules are synonymous with work-orderless, or rate-based, manufacturing. APS views a production schedule as a regular demand for items with a due date. Thus, a daily production schedule for 10 items per day is planned as 5 daily orders for 10 items.

- For items that you want to plan separately (usually high-cost items), create a master production schedule.

- As with production schedules, master production schedule orders are considered demands in APS.

- Specify order priorities for planning demands.

- Test the viability of different production situations without affecting your database.

Routine Steps

The life cycle for a single demand usually proceeds through the APS and scheduling functions like this:

1   The order entry user promises the order (demand incrementally planned during Get ATP/CTP).

2   The planning user runs the APS Planning activity. APS generates planned order to fill unsatisfied demand quantity.

3   The planning user firms the planned order into a job (for example, on the **Planning Detail** form) and releases it.

4   The scheduling activity schedules the job and generates the dispatch list.

5   The job is executed on the shop floor according to the dispatch list.

6   The order is shipped.

The next two sections describe the routine tasks associated with these events in a demand's life cycle.

Nightly Steps

You can place these tasks on the Background Queue to be run nightly, when few or no users will be saving changes to records that are included in the plan and schedule. For more information, see Scheduling Reports and Utilities to Run in the Background.

1   Run the Scheduling activity using **Days to Schedule** value that equals the Plan Horizon value for the APS function.

2   Run the APS Planning activity.

If you are using APS in a multi-site environment, you can use the **Global** mode to plan all demands at all sites. Usually you will run APS with a long horizon such as one or two months.

Daily Activities

These activities can happen in parallel.

- Create demands/promise orders during order entry and other daily activities. When you create a demand in the system, you can use the **Get ATP/CTP** function to project completion dates and to insert the demand into the current plan.

- Analyze the planning output and determine the causes for any lateness.

- Respond to the exception messages that display on the Exceptions Report or Planning Detail form.

- To determine when you must generate and release a job order or purchase order to ensure that an item is available when needed, use the Material Planner Workbench or Order Action Report.

- Firm planned orders using the Planning Detail form or the **Material Planner Workbench** form.

- Execute production according to the dispatch list (generated by the **Scheduling** activity).

- Record the status of operations (setup time, move time, and so on) for costing and scheduling purposes.

Troubleshooting

For descriptions of error messages you may encounter during any the above steps, see Troubleshooting MRP and APS.

About Specific APS Options

This chart displays the descriptions that you can specify on the **Planning Parameters**, and **What If Planning Parameters** forms, as well as any value restrictions associated with them.

Description	Value
Debugging - Retain Planner bulk data loading files	No value needed
Debugging - Retain Scheduler bulk data loading files	No value needed
Debugging - Disable Planner bulk data loading	No value needed
Debugging - Disable Scheduler bulk data loading	No value needed
Debugging - Trace days supply details	No value needed
Debugging - Trace mfg item safety stock details	No value needed
Debugging - Trace mfg item swapping details	No value needed

Debugging - Trace purchased item swapping details	No value needed
Debugging - Create gateway processor trace	No value needed
Deprecated - Use previous mfg item safety stock logic	No value needed
Deprecated - Use previous two-phase mfg item safety stock logic	No value needed
Deprecated - Perform additional pull passes with time fence disabled	No value needed
Deprecated - Forecasts can perform additional pull passes	No value needed
Deprecated - Do not force dates to be on the PCAL	No value needed
Prevent transfer demands from using safety stock	No value needed
Plan components at job start for released, scheduled jobs	No value needed
Plan mfg item safety stock as due today	No value needed
Generate output data for zero duration operations	No value needed
Allow release dates to be in the past	No value needed
Do not create move-out exceptions earlier than the safety stock date	No value needed
Debugging - Trace specified demand ID	String, APS Demand ID
Deprecated - Specify the mfg item safety stock multiplier	Floating point, greater than or equal to 0

Deprecated - Specify the preservation level multiplier	Floating point, between 0 and 999,999
Plan released jobs at the specified priority	Integer, greater than or equal to 0
Plan firm jobs at the specified priority	Integer, greater than or equal to 0
Override time fence for purchased items within the specified days	Integer, greater than or equal to 0
Use tolerance supply events are not critical if within the specified tolerance days	Integer, less than or equal to 0

Managing Specific APS Options

Note: These steps should only be followed at the recommendation of an Infor representative.

1   Open the Planning Parameters form, or What If Planning Parameters form.

2   Select the Specific APS Options tab.

3   In the Description field, specify the APS functionality to modify.

4   In the Value field, specify a value if necessary. Values that do not require a specification are labeled "No value needed."

For a list of descriptions and value parameters, see About Specific APS Options.

Creating APS Alternatives

An alternative is a container for specific data to drive APS and Scheduling. Each alternative represents a "what if" scenario to analyze. You must always have a *production*alternative, which is alternative "0." The alternative 0 references your Infor CloudSuite application data that you interact with on other forms. The APS Planning and Get ATP/CTP processes use the data in alternative 0.

To investigate possible changes to your process, you must create one or more *planning* alternatives (such as alternative 1, 2, 3, etc.) in addition to the production alternative.

Creating the Production Alternative

Infor CloudSuite provides a blank alternative 0; you must enter the information to reference your data.

1   Open the APS Sites and Alternative Management form.

2   Select Actions > New.

3   In the Alternative field, enter 0.

4   In the Planning Site field, select the Infor CloudSuite site you are defining.
If you have multiple Infor CloudSuite sites that will be included in global planning, you must create a separate alternative record for each site. That is, if you have two sites, A and B, you must create an alternative 0 record for site A and a second alternative 0 record for site B.

5   In the **Priority** field, enter the sequence number of this site for global planning.
When you run APS Planning in global mode, the system plans the site with the lowest Priority number (00) first.

6   If this is the alternative 0 record for the local site (that is, the site at which you're actually entering the record), **i**n the **Type** field, select **Local**. If this is the alternative record for one of the other sites in your environment, select **Remote**.

7   In the **APS Server Service Host Name** field, enter the name of the machine where the Planning and Scheduling Service is running.
This is typically the Infor CloudSuite utility server. See the *Installation Guide* for instructions on installing the Planning and Scheduling Service.

8   In the **APS Server Service Port** field, enter the port number on which the Planning and Scheduling Service is installed and running.
If you do not remember the number of the port on which you installed this service, open the Windows Services applet (**Start > Programs > Administrative Tools > Services**) on the Infor CloudSuite utility server and look for "Infor APS Server"; the port number will be listed along with the service name.

9   In the **Planner Database Host Name** field, enter the name of the machine where the planner database is running.
For instructions on installing and starting planner databases, see the *Installation Guide*.

10   In the **Planner Database Port** field, enter the port number on which the planner database is running.
This field associates the production alternative with the planner database in which the actual planning calculations are performed. This planner database must be running when you perform the Get ATP/CTP process or run APS Planning. For information on creating and starting a planner database, see the *Installation Guide*.

11   In the **SQL Host Name** field, enter the name of the machine where the SQL Server is installed.
The Planning and Scheduling Service uses this information to connect to the Infor CloudSuite application database.

12   In the **SQL Database Name** field, enter the name of your Infor CloudSuite application database.

13   In the **Timeout** field, enter the number of seconds for the system to wait for a response from a remote site when running APS Planning in global mode. Make sure the **Timeout** value is sufficient--we recommend at least 60 seconds.

14   Select **Actions > Save** to save the parameters. It takes several minutes for the save process to complete.

Repeat these steps to enter a production alternative record for each site in your environment.

Creating Alternative Plans

To create a planning alternative, follow the steps listed above for creating the production alternative, and change the steps as follows:

- In the **Alternative** field, enter a new number for the planning alternative (such as **1** or **2**).

- In the **Planner Database Port** field, enter the port number for a different planner database than the one you specified for the production alternative (make sure to first create and start an additional planner database for this alternative as described in the *Installation Guide*). Each alternative must reference a separate planner database.

Copying Production Data to a Planning Alternative

After creating an alternative plan, select the new alternative and click **Copy/Refresh** to copy the data from alternative 0 (the production alternative).

Displaying Demand Records

To determine which demands display on the **Demand Summary APS** and **Demand Summary - Scheduler** forms:

1 Ensure that Filter-in-Place is activated.

2 In the header section, use the Start Date and End Date fields to select the starting and ending dates to define the period you want to analyze. Only demands with
a Due date, Start date, End date, or Scheduled date within this date range will be displayed in the results grid. Leave the Start/End Date blank to use the default date specified in the Days to Schedule field on the Shop Floor Control Parameters form.

3 In the grid, use the Type, Demand ID, Item, and Days Late fields to further filter the demands that will display.

4 Deactivate Filter-in-Place.

   NOTE: When filtering by **Demand ID**, you must also enter a **Type**. Enter the **Type** first and then select the **Demand ID** on which to filter. The system uses the combination of
   the **Type** and **Demand ID** to filter the results.

   NOTE: When filtering by **Days Late**, enter the **>** symbol and a number of days late to limit the display; for example, enter >5 to display all demands with lateness greater than 5 days.

Running APS Planning

To run the APS plan, use the following procedure. This procedure deletes the existing plan and recreates it using the latest demand and capacity information.

1 Make sure the planner database is running.

2 Navigate to the APS Planning form.

> **NOTE:** Run this activity only at times when no other users will be saving changes to records that are included in the plan. You can run it on a recurring basis by scheduling it on the Background Queue. For more information, see Scheduling Reports and Utilities to Run in the Background..

3 Select whether to generate the plan for this local site (**Single-Site Plan**) or for all sites (**Global Plan**).

- A global plan generates transfer orders for any remote components using up-to-date planning data at the remote site. To use this option, multiple sites must be defined using the **Sites/Entities** form. Those sites must also be defined on the **APS Sites and Alternative Management** form. The site you are logged in to must be configured as the "local" site on the **APS Sites and Alternative Management** form and the other sites must be configured as "remote" sites.

- A single-site plan can generate transfer orders, but the system generates them using the item lead time and transit time (you can replicate them to the supply sites using the planning replication category).

4 To start the APS planning activity, click **Plan**.

The system displays the message: **Task Submitted**.

5 To find out if the process completed successfully, open the Background Tasks form.

If the planning task appears in the list with a **Return Status** of **0** (**Complete**), the task completed successfully.

6 When the process is finished, you can view the new planned orders and exception messages using the Planning Detail form or the Material Planner Workbench.

7 You can also analyze the plan output using one of several output analysis forms to determine bottlenecks in your resource capacity and to determine how your supplies are being used.

If any errors occur during this process, view the ERRORLOG table in the Infor CloudSuite SQL database for a more detailed error message. For more information, see Troubleshooting APS.

Analyzing APS Output

The system generates the plan output data when you run the APS Planning activity. You can view the results graphically and statistically, using forms and reports that depict system and component performance. The types of questions these forms and reports answer are usually related to a resource/resource group, an item, or demands.

Output Forms

Resource Utilization

Resource Group Utilization

Resource Group Load Profile

Resource Plan

Resource Group Plan

Resource Gantt Chart

Resource Load Profile

Material Planner Workbench

Master Planning Report

Master Planning Display

Demand Summary

Demand Detail Chart APS

Inventory Summary

Inventory Levels

Supply Usage Report

Projected Item Completions Report

Projected Item Completions by Resource Report

Item Bottlenecks Report

Resource and Resource Group Analysis

The table below describes how to answer specific resource and resource group-related questions on an output form:

When you want to do this...	Use this output form
View the load on a given resource or resource group.	Resource Load Profile APS, Resource Utilization
	Resource Group Load Profile APS, Resource Group Utilization APS
Find out which resources or resource groups are bottlenecks.	Resource Utilization
	Resource Group Utilization APS
View the plan for each resource or resource group.	Resource Gantt Chart APS, Resource Plan
	Resource Group Plan
View the sequence of work at a resource or resource group.	Resource Gantt Chart APS, Resource Plan
	Resource Group Plan

	Projected Item Completions by Resource Report APS
View the total quantity of items projected to be completed at a given resource or resource group on a range of dates.	Projected Item Completions by Resource Group Report APS

Item Analysis

The table below describes how to answer item-related questions on an output form:

When you want to do this...	Use this output form
Analyze the inventory level of all items in the database during a specified date range.	Inventory Summary
View a graph of the inventory and safety stock levels for a specified item during a specified date range.	Inventory Levels
View all requirements for an item for a specified period (also known as the "bucketed requirements" view).	Planning Summary
View all outstanding requirements, receipts, projected available quantities, and available to promise quantities for an item during a specified period in time.	Master Planning Display, Master Planning Report
View individual planning transactions related to a given item (including the exact day you need requirements).	Planning Detail
View multiple planned orders for multiple items based on a subset of the plan data (which you choose on the Material Planner Workbench Generation form).	Material Planner Workbench
View exception messages that describe any discrepancies in the plan for an item.	Planning Detail, Exceptions Report
View exception messages for multiple items in the plan.	Material Planner Workbench, Exceptions Report
Firm individual planned orders into purchase orders, jobs, etc.	Planning Detail
Firm multiple planned orders for multiple items at one time.	Material Planner

	Workbench
View usage details of all supplies in the system, including what demands have allocated those supplies.	Supply Usage APS, Supply Usage Report APS
View the total quantity of an item projected to be completed within a range of dates.	Projected Item Completions Report APS
View individual planning transactions related to a given item, arranged by item. An alternative view from the Planning Detail form.	Planning Detail APS

NOTE: The Pegging Display also shows demands for an item, but at a less detailed level than the information shown on the Supply Usage APS form.

Demand Analysis

The table below describes how to answer general demand-related questions on an output form:

When you want to do this...	Use this output form
For a range of dates, view information about all demands in the system. View the item, projected date, due date, and the number of days the demand is projected to be late.	Demand Summary APS
View a graphical representation of how a demand is planned, including components on the critical path to its completion. Identify the causes of waiting time.	Demand Detail Chart APS
View each purchased item's lead time and the number of demands that are delayed due to shortages of the item.	Item Bottlenecks Report APS

About the Planning Process

When the system plans a demand, it first searches backward from the due date to allocate the needed quantity (this is "pull planning"), and calculates the start date for the demand. In some cases, the system may not be able to plan the demand in the time between the due date and the current date, and the start date is calculated to be in the past. In this situation, the system instead plans the demand forward from the current time (this is "push planning").

These topics discuss the pull and push phases of the planning process in detail:

- Pull Planning
- Push Planning

Planning Considerations

Simultaneous Requests for the Same Resource

When two operations need the same resource for the same time period, the system adjusts the planned time of the lower-priority demand to avoid the conflict and to ensure a realistic plan.

Material Components

Material components required in the production process are either purchased, manufactured, or transferred from another site. When planning the end item, MRP and APS assume that all required components are available at the start of the job or operation where they are needed, depending on the setting of the Plan Materials At Operation Start planning parameter.

Dynamic Reallocation by Order Priority

When the system allocates on-hand inventory and planned supplies to satisfy a demand, that allocation is considered temporary until the demand is scheduled. Consequently, when you run the APS Planning activity, the system treats that inventory and supply as available for use, and reallocates it according to the ranking of the order's priority type defined on the APS Order Priority form.

Each priority type, such as "Order Entry Demand" or "Forecast Demand," has an assigned priority value. Order types with lower priority numbers consume available capacity before order types with higher priority numbers.

Demands and Supplies

A demand is a requirement for a quantity of an item. Supplies (also called receipts) are transactions that add to the available quantity of the item that can be allocated to a demand. To satisfy a demand, the system first allocates available supplies and/or on-hand inventory. After allocating supplies and on-hand inventory, if any quantity remains unsatisfied, the system creates a planned manufacturing order, purchase order, or transfer order.

Demand Types

A demand may be any of the following system transactions:

- PJOB Parent job
- PMPS Parent master production schedule
- PPS Parent production schedule
- PPLN Parent planned order

- PREQ Purchase order requisition
- CO Customer order
- FCST Forecast
- TRNS Transfer shipment
- TPLN Planned transfer
- MPS Master production schedule
- SSD Safety stock
- PROJ Project demand

NOTE: The system does not plan jobs or customer orders with a status of Stopped.

The system plans all requirements for a given demand before it considers the next demand.

Supply Types

A supply may be any of the following system transactions:

- JOB Job
- PO Purchase order
- PREQ Purchase order requisition
- PS Production schedule
- MPS Master production schedule
- PLN Planned order
- TRNR Transfer order receipt

Planning Flow

For a flow diagram detailing the planning algorithm, see *APS Planning Algorithm Flow Diagram*, available for download on the support site.

About Pull Planning

Pull planning is the process APS uses to backward plan a demand from its need date. Starting with the last operation in the end item's routing, the system searches for available supplies (such as purchase orders), inventory, and/or resources to complete the demand on time. The pull-planning process follows this sequence:

NOTE: These steps do not reflect every decision and assumption APS makes. These steps are intended to convey the general pull-planning process.

1 Search backward from the demand's due date to allocate planned supplies of the end item. If sufficient planned supplies are available to satisfy the demand quantity, the planning is complete.

2 For any unsatisfied demand quantity, search backward from the due date to allocate on-hand inventory. If sufficient inventory is on hand to satisfy the demand, the planning is complete.

NOTE: When APS allocates inventory to a demand, it considers the combined total of all inventory at all warehouses (at a given site) in which the Dedicated Inventory option is NOT selected.

3   If the previous two backward searches do not satisfy the demand quantity, search forward from the demand's due date plus the time defined by the Supply Usage Tolerance value. In this situation, where the system must allocate planned supplies within tolerance, it allocates as much of these tolerance supplies as possible before allocating earlier, non-tolerance supplies or on-hand inventory.

4   For any unsatisfied demand quantity, create a planned order. The type of item determines how the system creates the planned order:

- **For Infinite Items**: The system plans the demand at the request date and assumes it to be satisfied. If the Infinite field is selected on the Items record, the item is not constrained by resource capacity or lead time, and is assumed to be available immediately.

- **For Purchased Items**: The system checks the item's lead time to determine whether you can obtain the item by the due date. If so, the system creates a planned purchase order and planning is complete.

- **For Manufactured Items**: Manufactured items are planned differently depending on whether the item has a routing and whether the Planning Mode is Infinite APS or APS:

Does item have a routing?	Infinite APS Behavior	APS Behavior
Yes	Infinite APS pull plans the operations through the item's routing, starting with the end item's last operation. It determines the operation start dates by summing the Move, Queue, Setup, Run, and Finish times defined for the operations and assumes infinite resource capacity. After pull-planning the item through its routing, Infinite APS pull-plans the item's components. The setting of the Plan Materials at Operation Start field determines how the system sets the need date of a component requirement; if the parameter is selected, the need date of a component is the start date of the operation in which it is needed. If the parameter is cleared, the need date is the start date of the job.	APS plans the operations in the same manner as Infinite APS in almost all respects. The difference is that APS considers the finite availability of your resources. APS checks several combinations of resources to find the fastest combination. The Pull Iterations planning parameter determines how many combinations to check. This planning method is much more realistic in that the system does not over-promise an order during a period when there are actually no available resources to complete the order.

No	Infinite APS calculates the lead time for the end item. To determine the start date, Infinite APS plans backward, starting at the due date, to the lead time value. Resources have infinite capacity.	No difference from Infinite APS. When APS plans an item that does not have a routing, the item is treated as if the MRP Item option (on the Items record) has been selected for that item.

5   **For Transferred Items**: For information about how transferred items are planned, see About Global Planning.

If, at any level of the BOM, the system cannot plan the operation with enough time remaining to plan all remaining previous operations, the pull-planning fails and the system instead push plans the entire demand (see About Push Planning for more information).

6   If the item has a value specified in the Order Minimum field on the Items form, and the planned order quantity (the quantity the system plans to make or purchase) will satisfy the entire demand quantity, the system frees the supply and inventory allocated in step 1.

About the Time Fence

If the item being planned has a Time Fence defined, the pull-planning process includes additional steps. See Preserving Inventory and Supplies for Short-Term Demands for details.

About Push Planning

This topic applies only to APS.

If the system cannot find enough on-hand inventory, planned supplies, or resource capacity to pull plan a demand within the time between the due date and the current date, it instead *push plans* the demand forward from the current date. The system push plans a demand according to this sequence:

1   Calculate the end-item quantity needed. Allocate on-hand inventory to satisfy the end-item demand quantity.

NOTE: When APS allocates inventory to a demand, it considers the combined total of all inventory at all warehouses (at a given site) in which the Dedicated Inventory option is NOT selected.

2   Pass any remaining end-item demand quantity to the component materials, down to the lowest levels in the bill of material. Allocate on-hand inventory to satisfy the demand quantity of the components.

3   Plan the component materials in the lowest levels of the bill of material. This step consists of planning steps in the routing for manufactured components or moving out to the lead time for purchased components. For manufactured components, each operation in the component's routing is planned in forward sequence (starting with the first operation). The system checks several resource combinations to find the combination that can finish the work the fastest (the number of combinations to check is specified in the Push Iterations planning parameter). The

result is the component material's earliest-possible completion date, which sets the start date of its parent end-item's first operation.

4   Search for available planned supplies, starting with the current date and searching out to the date calculated in the previous step. Allocate supplies only if the entire demand quantity can be satisfied.

5   When forward planning is finished, the end-item completion date becomes the demand's Projected date.

6   The system may plan non-critical operations earlier than they are actually needed to meet the demand. To optimize the plan, the system runs a series of additional pull-planning iterations starting from the demand's new projected date.

   a   Pull plan starting from the projected completion date. If this plan fails (that is, if it projects a start date in the past), the system then pull plans the demand from the end of the Plan Horizon.

   b   Incrementally pull plan between the projected completion date from the above push plan (or between the need date and the Plan Horizon, if the above push failed) and the demand's need date to find a feasible plan that is within Pull Tolerance (see Planning Pull Tolerance or ATP/CTP Pull Tolerance) days of the optimal projected date. For example, the first iteration pulls from the midpoint between the projected date and the need date. If that pull plan succeeds, the next iteration pulls from the midpoint between that new projected date and the need date. The process incrementally moves closer to the need date until it finds a plan that a) doesn't calculate a start date in the past AND b) has a projected completion date that is within the Pull Tolerance days of being the optimal date.

NOTE: If the system is unable to push plan a demand in the time between the current date and the end of the Plan Horizon, the demand is displayed as "blocked" on the planning output forms and reports and cannot be planned. See About Blocked Demands for more information.

Examples: Resource Planning

The two examples below illustrate how the APS planning mode and Infinite APS planning mode plan resources when processing the same 4 jobs.

Input Data

The following input data is used in both examples.

- Resource groups:
  - "Crew" (labor): contains 3 resources (Crew1, Crew2, and Crew3).
  - "Skill_Crew" (labor): contains 2 resources (Skill_Crew1 and Skill_Crew2).
  - "TableSaws" (machine): contains 3 resources (TableSaw1, TableSaw2, and TableSaw3).
- Shifts: all labor resources are on-shift from 8:00 a.m. to 4:00 p.m. M-F. All machine resources are not on a shift (that is, they are always available).
- End items: a chair and a table.
- Routing for Chair:

- Op10 (Cut): requires 1 resource from Crew and 1 resource from TableSaws. Run duration is 0.1 hours per piece.
- Op20 (Assemble): requires 1 resource from Skill_Crew. Run duration is 0.2 hours per piece.

NOTE: Both the chair and the table require the same purchased components, but purchased components won't be a constraining factor in this illustration.

- Routing for Table:
  - OPTB10 (Cut): requires 1 resource from Crew and 1 resource from TableSaws. Run duration is 0.3 hours per piece.
  - OPTB20 (Assemble): requires 1 resource from Skill_Crew. Run duration is 0.4 hours per piece.

APS Example

Assume the planning mode is APS. There are currently 4 jobs in the system, each with a single line item. The operations for each order are grouped by the same color/shading for clarity in the example picture.

Orders:

- 1100 (Table): Qty 4, Color=Black
- 1200 (Chair): Qty 16, Color=White
- 1300 (Chair): Qty 8, Color=Green
- 1400 (Table): Qty 2, Color=Gray

All orders are due on 6/19/2002 at 2:00 p.m.

After planning these jobs, you can view how the resources are planned using the Resource Gantt Chart (shown below). Each bar represents an operation.

Because APS mode considers the resources to have finite capacity, the system loads most of the available resources in order to complete the job by the due date.

Infinite APS Example

Now assume the planning mode is Infinite APS and consider the same 4 jobs from the APS example above. The resulting Gantt chart is shown below.

Notice that the Crew1, Skill_Crew1, and TableSaw1 resources are doing the same work that in APS mode was distributed across several resources. Because Infinite APS mode considers the resources to have infinite capacity, only one of each required resource type is loaded.

NOTE: Because multiple tasks are assigned to single resources in Infinite APS mode, some gantt bars for operations are hidden behind other gantt bars (as noted in the graphic).

About What-If Planning and Scheduling

During your planning analysis, you may need to investigate corrective actions before executing them within the current production plan and schedule. An alternative specifies the data that drives a run of the APS Planner or Scheduler. Each alternative represents a scenario to be analyzed. Typically, you will design several alternatives to investigate a set of viable options.

You can switch between analyzing Planner or Scheduler data by selecting **Planner** or **Scheduler** from the Options button on each analysis screen. Planner is the APS program that generates synchronized manufacturing plans. Scheduler is the APS program (apssrvr.exe) that optimally sequences operations to produce a realistic production schedule.

You can create "what-if" scenarios with copies of your production data, make adjustments to the data, and then analyze the results to determine whether the scenario is feasible. Use these forms to analyze alternate planning data:

Control Forms

    APS Planning

    APS Sites and Alternate Management

    Planning Parameters

    Scheduling

    Scheduling Parameters

    What If Planning Parameters

Input Forms

    Batch Definitions

    Holidays

    Resources

Resource Groups

Shift Codes

What If Demands

What If Items

What If Operations

What If Planner BOMs

What If Planner Effectivities

What If Planner Item Deliveries

What If Planner Remote Items

What If Routings

What If Scheduler Batched Productions

What If Scheduler BOMs

What If Scheduler Items

What If Warehouses

About Incremental Planning and ATP/CTP

This topic applies only to APS.

When you create, delete, or make changes to...

- any of the system's base manufacturing data
- most types of system transactions
- certain planning parameters

The system does not instantly apply these changes to the APS plan. The next time you run APS Planning, all current data will be used. This "delay" allows you to choose when to disrupt the existing plan with the new information.

However, you can insert most types of demand-related transactions into the current plan individually. When you add or update these transactions, the system incrementally updates the plan at each APS gateway refresh interval. In most cases, these transactions involve changes that are not disruptive. The new demand uses any inventory, supplies, and capacity that were unallocated after the last run of APS Planning and any previous incremental plans.

This topic describes the two methods of inserting a transaction into the APS plan:

- Saving the transaction.
- Clicking the Get ATP or Get CTP button on the transaction.

Planning Demands by Saving Them

The system inserts the following types of demands into the plan incrementally when you *initially* create and save them, provided the **Plan on Save** field is selected on the record you are saving (see below for information about this field).

- Customer order lines
- Customer order blanket releases
- Project resources
- Transfer order lines
- Job orders (whether created on the Job Orders form or Engineering Workbench form)

The system plans the demand using the inventory, supplies, and resource capacity that were not allocated to other demands during the last run of APS Planning or any previous incremental plans.

If you later make changes to an existing demand and want the changes to be updated in the plan, click the **Get ATP/CTP** button. If you want to delay replanning the changes until the next time you run APS Planning, make the changes and save the record, but do not click the Get ATP/CTP button.

About the Plan on Save Field

The **Plan on Save** field appears on the editing forms for each of the above demand types. If this check box is selected, the record is incrementally planned when you save the record, as described previously. If it is not selected, the record is NOT incrementally planned when you save it; you must click the Get ATP/CTP button and accept the availability results in order to incrementally plan the record. See the Run on Save help topic for details about why you should select or clear this field.

Planning Demands Using Get ATP and Get CTP

The Get ATP or Get CTP button is available for several system demands. These buttons allow you to test the viability of a demand and possible availability date against the current state of your APS plan and then actually insert the demand into the plan. To perform this "test plan," the system inserts the demand into a *copy* of your plan, using the input date you enter. It returns a realistic projected completion date, which you can then accept or reject.

If you accept the projected date, the system incrementally plans the demand in your actual production plan using that projected date. The demand is planned using the inventory, supplies, and resource capacity that were not reserved by other demands during the last run of APS Planning or by demands that were previously incrementally planned. If the projected date is unacceptable, you can cancel the incremental planning or you can override the projected date and plan the demand using an earlier date.

The Get ATP/CTP function is available for the following system demands:

- Customer orders
- Estimates (only for getting a projected date; estimates are not incrementally planned)
- Customer order lines
- Estimate line items (only for getting a projected date; estimate lines are not incrementally planned)

- Customer order blanket releases
- Project resources
- Estimate project resources (only for getting a projected date; estimate project resources are not incrementally planned)
- Transfer order lines
- Job orders
- Forecasts (but not forecasts for MPS items)
- Master Production Schedule

NOTES:

- If you're using Infinite APS, the Get ATP button is available. If you're using APS, the Get CTP button is available. See the "Infinite APS vs. APS" section of the APS Overview for a discussion of the differences between Get ATP and Get CTP.
- If the demand is associated with a warehouse in which the Dedicated Inventory field is selected, you cannot perform the Get ATP/CTP process. The error message "Availability cannot be checked for demands from warehouses with dedicated inventory" displays.
- Availability of MPS items can be checked only on the MPS Orders and Job Orders forms.

Planning Remote Components

During an incremental planning or ATP/CTP process that involves a component produced at a remote supply site, the system contacts the supply site to perform the incremental planning. A planned transfer *supply* order is created at the receiving site and a planned transfer *demand* order is created at the supply site. If no supply sites are defined on the APS Sites and Alternate Management form (for example, you may be using replication categories to make transfer demands visible at the supply sites), the system plans the transfer demand order using the item's lead time and the transit time specified on the Inter-Site Parameters form.

If supply sites are defined on the Planning Parameters form, all incremental planning runs in global mode, including ATP and CTP processes, and transfer orders are planned at the supply sites.

Setting Up Planned Transfer Order Replication

This topic applies to MRP and APS.

Overview

The MRP and APS systems generate planned transfer supply orders (PLNs) for any components provided by remote supply sites. The due date on these PLNs will be based on each item's lead time and transit time. To generate the corresponding planned transfer demand, or TPLN, at the supply site (that is, for the supply site to "see" this demand), you must set up the system to replicate the planned transfer order to the supply site.

This topic describes how to set up the transfer order replication.

About the Replication Category

The "Planning" category is already set up for you on the Replication Categories form. You do not need to change the settings.

Defining Replication Rules for Transfer Orders

You must define the receiving site, supply site, and update frequency parameters for replicating the transfer orders. Follow these steps:

1 Navigate to the Replication Rules form.

2 Select **Actions > Filter>Cancel in Place**.

3 Select **Actions > New**.

4 In the Source Site field, select the ID of the receiving site (the site where the demand originates).

5 In the To Site field, select the ID of the supply site that produces the component. This should be the same site defined as the Supply Site on the item record. The planned transfer order will be replicated at this site.

6 In the Category field, select **Planning**.

7 In the Interval Type field, select the interval at which you want the transfer orders to be replicated to the target site.

8 See the help topics for the remaining fields on this form for additional options.

9 Select **Actions > Save** to save the record.

10 Repeat these steps to create replication rule records for every Source-Target site combination in which you want transfer orders to be replicated.

NOTES:

• Multiple planned transfer demands are consolidated before being replicated to the supply site.

• At the supply site, the planned transfer demand is incrementally planned as soon as it arrives (automatically). However, the resulting projected date for the order is not replicated back to the receiving site that generated the demand. At the receiving site, when you firm the planned transfer supply order into an actual transfer order, the system replicates that transfer order to the supply site and deletes the planned transfer demand (TPLN). Replication always keeps supply and demand transfer orders synchronized (but it does not do this for *planned* transfer orders).

• The due date on a planned transfer order reflects transit time.

Compatibility of MRP and APS Sites

Sites running MRP Planning can replicate transfer orders to sites running APS Planning. Sites running APS Planning (in single-site mode) can replicate transfer orders to sites running MRP Planning. However, sites running APS Planning in Global mode cannot replicate transfer orders to MRP sites.

Troubleshooting APS

You might encounter the following error messages when running APS Planning or when performing the ATP/CTP function and incremental planning. You should be able to diagnose and fix these errors using the solutions described below. To find a particular error message below, press Ctrl + F to open the **Find** dialog and search for the message.

If a documented solution does not fix the problem, contact Infor Technical Support.

Errors may appear in one or more of these places in the system:

Activity or Process	Error Type	Location
Get ATP/CTP	Error	Error message displayed on the form when you click the Get ATP/CTP button.
Planning activity: preprocessing, planner database reload, or core planning algorithm processes	Error	Background Task History form (Task Messages tab).
Planning activity or Get ATP/CTP: preprocessing, planner database reload, or core planning algorithm processes--additional detail	Error	ERRORLOG table in application database.
Planning activity or Get ATP/CTP: preprocessing, planner database reload, or core planning algorithm processes--additional detail	Error	apserror.txt file (located on the machine where the Planning and Scheduling Service is installed--usually in c:\winnt\system32).
Planning activity or Get ATP/CTP: core planning algorithm processes--additional detail. Available after planning algorithm completes.	Error	ol_error.txt file (located on the Planning server machine--usually in ..\projects\&ltdatabase name>\ol_log under your Planning Server installation or on the machine where the Planning and Scheduling Service is installed--usually in c:\winnt\system32).
Planning activity or Get ATP/CTP: problems related to a parameter causing a date to exceed the Plan Horizon, information about demands being blocked, and other assorted messages etc. Available after	Error, Warning, or Informational	ol_sched.txt file (located on the Planning server machine--usually in ..\projects\&ltdatabase name>\ol_log under your Planning Server installation).

planning algorithm completes.

NOTE: Errors from the Infor CloudSuite Scheduler are logged in the TRACELOG table in the Infor CloudSuite application database.

This topic describes the Get ATP/CTP, Background Task History, ERRORLOG, and the **View Planning Messages** form messages.

Get ATP/CTP Messages

The errors listed in the table below appear when you click the Get ATP or Get CTP button on certain Infor CloudSuite transactions.

Error Message	Explanation and Solution
Availability request requires a demand quantity greater than zero.	You cannot perform Get ATP/CTP on a demand that has a quantity of zero. For example, a customer order line's demand quantity = Qty Ordered - Qty Reserved - Qty Shipped. A forecast's demand quantity = Outstanding Requirement.
A batch planning run is in progress. Please try again later.	Another client session is running the APS Planning activity. Wait a few minutes and try again.
Cannot be completed within the current planning horizon.	The system did not find sufficient capacity or material to plan an order within the time period specified in the Plan Horizon field (on the Planning Parameters form). You can try reducing the quantity, using a later Due Date, or adding new resource capacity to allow the demand to be planned. Sometimes this error occurs if the resources in a resource group are on mutually exclusive shifts and the operation requires all of those resources.
Cannot retrieve planner connection information for the specified alternative.	The alternative 0 record specified in Planning Parameters does not specify valid planner database connection information (port #, host name, etc.).
Configured items must be cross-referenced to a job.	You performed the Get ATP/CTP function for a configured order line, but the order line was not cross-referenced to a job. In order to get

	an ATP or CTP date for a configured item, the item must be cross-referenced to a job.
Forecasts for MPS items must be planned using the MPS Processor.	When you enter a forecast for an MPS item on the Forecasts form, the Get ATP/CTP process does not plan the forecast; to plan this demand, you must run the MPS Processor.
Flush of gateway table is in progress. Please try again later.	The APS Planning activity was running when the Get ATP/CTP process tried to run it. Wait a few minutes and try again.
Flushing of the gateway table was unsuccessful. See ERRORLOG table for details.	Check the ERRORLOG table in the SQL database. Find the detailed error message in the ERRMSG column. ERRORLOG messages are described below in the ERRORLOG Messages section.
Item not found in planning database.	There are two possible causes:
	You recently created this item on the Items form, but have not run the APS Planning activity since you created the item. You must run the APS Planning activity to insert the new item into the planner database.
	The item you are planning was not sent to the planner database during the Get ATP/CTP process. Check the Windows Services program to make sure the Gateway service is running. See the Installation Guide for information about starting the Gateway service.
Job (number) does not exist.	You performed the Get ATP/CTP function for an order line that is cross-referenced to a job, but the job did not exist in Infor CloudSuite.
Network communications error.	At some point in the planning or scheduling process, a network connection was lost. There are three possible causes:
	The site parameters on the Planning Parameters form are not set correctly. Make sure you specify the same Planner Database Port number with which you start the planner

	database.
	Your planner database is not running. Use the Planner Manager utility to start the database.
	There is an operating system configuration, hardware, or network problem.
Out of memory.	The planner database server does not have enough available system resources to run the program. Close any unnecessary applications or add more memory to the server.
Planner database is marked as down.	The planner database specified for the alternative 0 record (in Planning Parameters) is not running. Verify that the database is running in Planner Manager. Then check the ERDB.STATUS field in the SQL database. If the value is -1, change it to 0 to clear the planner database status.
Planner database reload in progress. Please try again later.	Another client session may have been running the APS Planning activity or a Get ATP/CTP process. Wait a few minutes and try again.
The cross-referenced job is already scheduled.	You performed the Get ATP/CTP function for an order line that is cross-referenced to a job, and the job has already been scheduled (it has a status other than Firm). Infor CloudSuite moves the Job's End Date to the order line's Projected field and disables the Get ATP/CTP button.
There already exists a key with that value.	Make sure your ol_schema.txt file includes the correct character width allocation for the indicated database field. If a database field has more characters than are allocated in the ol_schema.txt file, the system truncates the field, which can cause duplicate IDs. See the Installation Guide for more information about correctly sizing the ol_schema.txt file.
Unable to connect to APS Server.	The APS Server Service Port number specified in Planning Parameters is not valid.

	Check the Windows Services configuration to verify the port number on which the APS Server Service is running, and correct the entry in Planning Parameters.
Unable to connect to Planner Database Server.	The planner database host machine specified in Planning Parameters was not found or was down.
Version mismatch	The server and client (or DLL) are not compatible software versions. Contact Technical Support.
The firm job for which you are about to check availability may have recently been converted from a PLN with no planning run since its conversion. Under these circumstances, the availability check will return a conservative Projected Date. Use caution if you use the new Projected Date information to change your job End Date. However, if this job was not generated from a PLN, the availability check will be proper. Do you wish to proceed?	If the job on which you are performing Get ATP/CTP was firmed from a planned order, the information is already in the plan and capacity is allocated. If you check availability for this job, you are essentially "double-counting" it, which will result in an artificially conservative Projected date. Click Yes if you are comfortable with this fact. If you do not want to check availability for this job now, click No (and then try it again later after the next run of the APS Planning activity).

Background Task History Messages

The errors listed in the table below appear with the **Planning** task on the **Background Task History** form.

Error Message	Explanation and Solution
ApsPlan: Error -30000 running the Planner. Network communications error.	At some point in the planning or scheduling process, a network connection was lost. There are three possible causes:
	The site parameters on the Planning Parameters form are not set correctly. Make sure you specify the same Planner Database Port number with which you start the planner database.
	Your planner database is not running. Use the Planner Manager utility to start the database.
	There is an operating system configuration, hardware, or network problem.
ApsPlan: Error -30001	The process was not able to connect to the Planning and

running the Planner. Network communications setup error.	Scheduling Service. Check the Windows Services application to make sure apssrvr.exe is running and that TCP/IP is configured correctly on this machine.
ApsPlan: Error -30002 running the Planner. Cannot resolve host address.	The process was not able to connect to the host machine that is specified in the Planning and Scheduling Service configuration.
ApsPlan: Error -30003 running the Planner. Version mismatch.	The server and client (or DLL) are not compatible software versions. Contact Technical Support.
ApsPlan: Error -30004 running the Planner. Registry access error.	The process was not able to retrieve connection information from the machine's Windows registry. The machine's registry permissions might not be set up correctly, or some of the registry files may have been deleted.
ApsPlan: Error -30005 running the Planner. Error connecting to SQL database.	The process was not able to connect to the SQL database specified in the Planning and Scheduling Service configuration. Make sure the SQL Server Service is running on the SQL Server and that the database exists and is specified correctly in the Planning and Scheduling Service configuration.
ApsPlan: Error -30006 running the Planner. Error in SQL query.	There is an error in the system code or the database schema. Contact Technical Support.
ApsPlan: Error -30007 running the Planner. Alternative not found.	The alternative "0" specified in Planning Parameters was not found in the SQL database. Reenter the alternative 0 record on the Planning Parameters form.
ApsPlan: Error -30010 running the Planner. Cannot retrieve planner connection information for the specified alternative.	The alternative 0 record specified in Planning Parameters does not specify valid planner database connection information (port number, host name, etc.).
ApsPlan: Error -30011 running the Planner. Error connecting to Planner Database Server.	The planner database host machine specified in Planning Parameters was not found or was down.
ApsPlan: Error -30012 running the Planner. Planner	Check apserror.txt to find the specific Planner API call and its

API returned error.	return code.
ApsPlan: Error -30013 running the Planner. Planner database reload in progress, API call aborted.	Another client session may have been running the APS Planning activity or a Get ATP/CTP process. Wait a few minutes and try the task again.
ApsPlan: Error -30014 running the Planner. Planner database is marked as down.	The planner database specified for the alternative 0 record (in Planning Parameters) is not running. Verify that the database is running in Planner Manager. Then check the ERDB.STATUS field in the SQL database. If the value is -1, change it to 0 to clear the planner database status.
ApsPlan: Error -30016 running the Planner. Planner database reload was unsuccessful. See ERRORLOG table for details.	Check the ERRORLOG table in the SQL database. Find the detailed error message in the ERRMSG column. ERRORLOG messages are described below in the ERRORLOG Messages section.
ApsPlan: Error -30018 running the Planner. The Planner is currently running for the specified alternative.	The APS Planning activity was running or another client session was accepting the Projected date during a Get ATP/CTP process. Wait a few minutes and try again. If the error persists, verify that the APS Planning activity is not running. If the APS Planning activity is not running, check the ERDB.STATUS field in the SQL database. If the value is 2, change it to 0.
ApsPlan: Error -30019 running the Planner. Generation of planned orders was unsuccessful. See ERRORLOG table for details.	Check the ERRORLOG table in the SQL database. Find the detailed error message in the ERRMSG column. ERRORLOG messages are described below in the ERRORLOG Messages section.
ApsPlan: Error -30020 running the Planner. Flushing of the gateway table was unsuccessful. See ERRORLOG table for details.	Check the ERRORLOG table in the SQL database. Find the detailed error message in the ERRMSG column. ERRORLOG messages are described below in the ERRORLOG Messages section.
ApsPlan: Error -30029 running the Planner. Flush	The APS Planning activity was running when the TaskMan service tried to run it. This error means that the system thinks a

of gateway table in progress, API call aborted.	Planning function is already running, specifically the flushing of information between the Infor CloudSuite SQL database and the planner database. This situation can occur if the function had been interrupted for some reason and was unable to reset its status. The solution is to reset the STATUSNO column to 0 (zero) in the ERDB table of the Infor CloudSuite SQL database.
ApsPlan: Error -30031 running the Planner. Cannot retrieve site connection information for one of the sites.	The data in the APSSITE table for a site defined in the Planning Parameters form is missing or invalid.
ApsPlan: Error -30032 running the Planner. Error connecting to APS Server.	The APS Server Service Port number specified in the Planning Parameters form is not valid. Check the Windows Services configuration to verify the port number on which the APS Server Service is running, and correct the entry in Planning Parameters.
ApsPlan: Error -30034 running the Planner. Planner database host or port does not match site information.	The planner database host and/or port (in the APSSITE table) specified at the local site does not match what is defined at the remote site.
ApsPlan: Error -30035 running the Planner. Error starting global planner run.	Check apserror.txt for more detailed error messages.
ApsPlan: Error -30036 running the Planner. Error ending global planner run.	Check apserror.txt for more detailed error messages.
ApsPlan: Error -30037 running the Planner. ApsSchedulerStartSp returned an error.	For more detailed error messages, check apserror.txt or run this query: EXECUTE dbo.ApsSchedulerStartSp 0, -1
ApsPlan: Error -30038 running the Planner. ApsPlannerStartSp returned an error.	For more detailed error messages, check apserror.txt or run this query: EXECUTE dbo.ApsPlannerStartSp 0, 2, '*', -1

ApsPlan: Error -30039 running the Planner. Add alternative failed, API call aborted.	Check apserror.txt for more detailed error messages.
ApsPlan: Error -30040 running the Planner. Alternative already exists.	Specify a different alternative number.
ApsPlan: Error -30041 running the Planner. Alternative not a valid number, check value or license.	Specify an alternative number between 1 and 999.
ApsPlan: Error -30042 running the Planner. Error running ApsMsg. See ERRORLOG table for details.	Check the ERRORLOG table in the SQL database. Find the detailed error message in the ERRMSG column. ERRORLOG messages are described below in the ERRORLOG Messages section.
ApsPlan: Error -30043 running the Planner. A remote site definition is missing.	Verify that all of your transfer items have a valid site specified.

ERRORLOG Messages

The errors listed in the table below appear in the ERRORLOG table in the Infor CloudSuite SQL database. These errors include an error code in the ERRPROC column that indicates the area in the system that created the error. These codes are described below:

- **RELOAD:** The error occurred during a bulk reload of all SQL tables to the planner database.
- **GWP:** The error occurred while the Gateway Processor service was transferring data from the SQL tables to the planner database.
- **API:** The error occurred while the system was calling a command from the APS Server Service.

In the list of errors below, the [**%s**] codes represent actual ID data that will appear in the message (such as an item or order ID).

General Message (ERRMSG column)	Error Function (ERRFUNC column)	Error Code (ERRCODE column)	Description
Order record does not exist for scheduled operation at [%s] for order [%s] and resource [%s]	N/A	N/A	The order listed in the SCHEDOP record does not exist in the ORDER table in the Infor CloudSuite SQL database. Contact Technical Support.
Unable to add shift [%s]	ol_cadd_shift	-100	Invalid value for shift.
Unable to add calendar [%s]		-5	The shift, shift exception, or holiday already exists ("calendar" in the error message refers to a Holiday definition in Infor CloudSuite).
Unable to add offshift [%s]			
Unable to add overtime shift [%s]		-12	The planner database field is full. Increase the width or depth for the Shift field in the ol_schema.txt file.
Unable to add scheduled operation at [%s] for order [%s] and resource [%s]	ol_cadd_frozensch	-12	When attempting to allocate resources to firm demands, the planner database field is full. Increase the width or depth for the Schedule field in the ol_schema.txt file.
Unable assign a priority to site [%s]	ol_cadd_seqsite	-4	The site priority list index is not valid.
Unable to assign BOM [%s] to finished material [%s]	ol_cadd_prt22bom	-1	When trying to add a bill of material to an item. The item was not found in the database.
		-2	The bill of material was not found in the database.
		-4	The item-bill of material list index was not found in the

			database.
		-12	The planner database field is full. Increase the width or depth of the Prt22Bom field in the ol_schema.txt file.
		-18	Recursive bills of material are not allowed. Make sure the item is not a component of itself, either directly or through a subcomponent.
Unable to assign component material [%s] to BOM [%s]	ol_cadd_bom22prt	-1	When trying to add an item to a bill of material, the bill of material was not found in the database.
		-2	The item was not found in the database.
		-4	The bill of material-item list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the Bom22Prt field in the ol_schema.txt file.
		-18	Recursive bills of material are not allowed. Make sure this task does not make the item a component of itself, either directly or through a subcomponent.
Unable to assign date range [%s] through [%s] to calendar [%s]	ol_cadd_shfavailable	-1	When adding a range of dates to a shift, shift exception, or holiday, the shift ID to be changed was not found in the database.
Unable to assign date range [%s] through [%s] to		-12	The planner database field is full. Increase the width or

offshift [%s]			depth of the ShfAvailable field in the ol_schema.txt file.
Unable to assign date range [%s] through [%s] to overtime shift [%s]		-23	The shift, holiday, or shift exception has an invalid time or duration.
Unable to assign timeslot [%s] to shift [%s]			
Unable to assign jobstep [%s] to process plan [%s]	ol_cadd_rte22opr	-1	When adding an operation to a routing, the routing was not found in the database.
		-2	The operation was not found in the database.
		-4	The routing-operation list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the Rte22Opr field in the ol_schema.txt file.
Unable to assign local material [%s] to remote site [%s]	ol_cadd_prt22sit	-1	When adding a supply site definition to an item, the item was not found in the database.
		-2	The remote supply site's Site/Entities record was not found in the database.
		-4	The item-site list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the Prt22Sit field in the ol_schema.txt file. Should be set to the total number of part/remote site configurations.

Unable to assign local order [%s] to remote order [%s]	ol_cadd_xfrparent	-1	When adding information about a parent demand to a planned demand transfer order at the supply site, the parent demand was not found in the database.
		-2	The planned demand transfer order does not exist.
Unable to assign outsourced material [%s] to order [%s]	ol_cadd_ord22prtpur	-1	When adding a purchased item to the order, the order was not found in the database.
		-2	The purchased item was not found in the database.
		-4	The order-item list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the Ord22PrtPur field in the ol_schema.txt file.
Unable to assign process plan [%s] to material [%s]	ol_cadd_prt22rte	-1	When adding a routing to an item, the item was not found in the database.
		-2	The routing was not found in the database.
		-4	The item-routing list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the Prt22Rte field in the ol_schema.txt file.
		-24	The routing is being used by another item.

Unable to assign remote order [%s] to local order [%s]	ol_cadd_xfrchildren	-1	When creating a cross-reference record between a planned demand transfer order and its parent demand order, the parent demand was not found in the database.
		-2	The planned demand transfer order does not exist.
		-4	The order-remoteorder list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the XfrChildren field in the ol_schema.txt file.
Unable to assign resource [%s] to offshift [%s] Unable to assign resource [%s] to overtime shift [%s]	ol_cadd_shf22res	-1	When assigning a resource to a shift exception, the shift was not found in the database.
		-2	The resource was not found in the database.
		-4	The shift-resource list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the Shf22Res field in the ol_schema.txt file.
Unable to assign resource [%s] to resource group [%s]	ol_cadd_cat22res	-1	When assigning a resource to a resource group, the resource group was not found in the database.
		-2	The resource was not found in the database.
		-4	The resource group-resource list index is invalid.

		-12	The planner database field is full. Increase the width or depth of the Cat22Res field in the ol_schema.txt file.
Unable to assign resource [%s] to shift [%s]	ol_cadd_res22shf	-1	When assigning a resource to a shift, the resource was not found in the database.
		-2	The shift was not found in the database.
		-4	The resource-shift list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the Res22Shf field in the ol_schema.txt file.
Unable to assign resource group [%s] to jobstep [%s]	ol_cadd_opr22cat	-1	When assigning a resource group to an operation, the operation was not found in the database.
		-2	The resource group was not found in the database.
		-4	The operation-resource group list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the Opr22Cat field in the ol_schema.txt file.
Unable to assign token [%s] to remote order [%s] in planner database's OrderDashPart	ol_cadd_orderdashpart	-100	Invalid value for the local order ID (which is part of a cross-reference record to associate the original demand to the planned transfer demand order at the supply site).

table		-12	The planner database field is full. Increase the width or depth of the OrderDashPart field in the ol_schema.txt file.
Unable to create remote order [%s] for local order [%s]	ol_cadd_remoteorder	-100	When creating the cross-reference between a planned demand transfer order and its parent demand order, the planned demand transfer order was not found in the database.
		-12	The planner database field is full. Increase the width or depth of the RemoteOrder field in the ol_schema.txt file.
Unable to include material [%s] on material delivery order [%s]	ol_cadd_ordlineitem	-1	When adding an item to a demand (purchase order, job, etc.), the demand was not found in the database.
Unable to include material [%s] on order [%s]		-2	The item was not found in the database.
		-4	The demand-item list index is invalid.
		-12	The planner database field is full. Increase the width or depth of the OrdLineItem field in the ol_schema.txt file.
Unable to transfer BOM [%s]	ol_cadd_bom	-5	When sending a bill of material to the ERDB, the bill of material already exists.
		-12	The planner database field is full. Increase the width or depth of the BOM field in the ol_schema.txt file.
Unable to transfer	ol_cedt_misc	-101	A parameter on the Planning

configuration parameters to the planner database.		through -126	Parameters form is invalid (these errors are unlikely to occur; contact Technical Support).
Unable to transfer effectivity [%s]	ol_cadd_effectivity	-5	When sending an effectivity record to the planner database, the effectivity already exists.
		-12	The planner database field is full. Increase the width or depth of the Effectivity field in the ol_schema.txt file.
Unable to transfer jobstep [%s]	ol_cadd_operation	-5	When creating an operation, the operation ID already exists.
		-12	The planner database field is full. Increase the width or depth of the Operation field in the ol_schema.txt file.
Unable to transfer material [%s]	ol_cadd_part	-5	When sending an item to the planner database, the item ID already exists.
		-12	The planner database field is full. Increase the width or depth of the Part field in the ol_schema.txt file.
Unable to transfer material delivery order [%s] Unable to transfer order [%s]	ol_cadd_order	-5	When sending a demand (such as a purchase order, job, etc.) to the planner database, the demand ID already exists.
		-12	The planner database field is full. Increase the width or depth of the Order field in the ol_schema.txt file.
Unable to transfer order priority rule	ol_cadd_seqruletype	-12	The planner database field is full. Increase the width or

			depth of the SeqRuleType field in the ol_schema.txt file.
Unable to transfer process plan [%s]	ol_cadd_route	-5	When sending a routing to the planner, the routing ID already exists.
		-12	The planner database field is full. Increase the width or depth of the Route field in the ol_schema.txt file.
		-103	When sending demands to the planner database, the system is unable to send routings and BOMs. Search the product knowledge base at our support web site for the solution to this problem or contact Support.
Unable to transfer resource [%s]	ol_cadd_resource	-5	When sending a resource to the planner database, the resource ID already exists.
		-12	The planner database field is full. Increase the width or depth of the Resource field in the ol_schema.txt file.
Unable to transfer resource group [%s]	ol_cadd_category	-5	When sending a resource group to the planner database, the resource group ID already exists.
		-12	The planner database field is full. Increase the width or depth of the Category field in the ol_schema.txt file
Unable to transfer site [%s]	ol_cadd_site	-5	When sending a site record to the planner database, the site ID already exists.

	-12	The planner database field is full. Increase the width or depth of the Site field in the ol_schema.txt file.

View Planning Messages Form Errors

Error Message	Explanation and Solution
WARNING: Routing not found, planning using lead time instead	The item does not have a routing; the system planned it using the item's standard lead time.
BLOCKED: Unsatisfied resource combinations for operation	The operation required more resources than are available from this resource group. The system planned the operation using all available resources from the group and continued planning.
BLOCKED: Line item 1 cannot be planned	The item number refers to the sequencing of end item processing for Order Maximum groupings for the indicated order.

Using Alternate Materials in a Bill of Material

This topic applies to APS.

Overview

You can set up an operation in an item's current routing to be able to select from a group of alternate materials (which you specify for the operation) when the primary material will not be available by the due date. Or, by selecting the Use Latest Pull for Alternate Items parameter, you can configure the system to examine the availability of the primary material AND each alternate material and plan the one that can be obtained or manufactured the fastest.

NOTE: The Alternate Item field on the Items form does not have any effect on the features described in this topic. The Alternate Item field is for reference only.

Setting Up the Bill of Material

Suppose you have a BOM that looks like this:
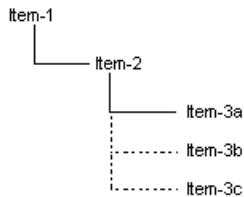
In this BOM, Item-3a is the primary material of an "Alternate Group." Item-3b and Item-3c are alternates for Item-3a. Any one of the three materials can be used to make Item-2. To set up this type of BOM in the system, follow these steps.

1   Before you start defining the BOM in the system, plan it on paper and decide what material will be the primary and what materials will be the alternates.

2   Create an operation for your parent item on the **Current Operations** form and save it. For example, in the graphic above, this operation would be for assembling Item-2.

    NOTE: Items with the Configuration Flag selected on the Items form cannot have alternate materials.

3   Click the **Materials** button to open the **Current Materials** form.

4   Select **Actions > New**.

5   In the **Material** field, select an item number to add as the primary material in this alternate group. For example, in the graphic above, this material would be Item-3a. Materials in an alternate group must be defined on the Items form (they must be inventoried items).

    Notice the **Alt Group Rank** is automatically set to 0; this value identifies this item as the primary material for this alternate group. The system plans alternate materials in sequence of Alt Group Rank, and will always attempt to plan the primary material first. You cannot change this Rank value after you save the record, so make sure this is the item you want as the primary item.

    Also notice the **Alt Group** field contains the number 1. In the next steps, we will set the Alt Group to 1 for each material we add to the operation to make them all members of the same alternate group.

6   Enter the appropriate information in the remaining fields to complete the definition of this material and then select **Actions > Save** to save the record.

7   Select **Actions > New** to add the next material record. This time, when you select an item number in the Material field, notice the Alt Group field contains the number 2 (the Alt Group field defaults to the number in the material's Seq field).

8   You want this material to be an alternate for the previous material you added, so change the **Alt Group** to **1**.

    NOTE: You cannot change a material's Alt Group after you save the record (however, you can delete it and then re-add it with a different group ID if necessary).

9   Complete and save the material record.

10 Select **Actions > New**.

11 Select an item number in the **Material** field to represent the final alternate material for this operation.

12 The **Alt Group** defaults to 3; change it to **1**.

13 Complete and save the material record.

Changing the Ranking Within a Group

At this point, the three materials you added in the above steps are members of Alt Group 1, and any one can be used by the operation to which you added the materials. The primary material has an Alt Group Rank of 0, the second material you added has a rank of 1, and the third has a rank of 2. This ascending rank determines the sequence in which the system chooses an alternate material to plan. You can change the rank of each alternate material using the **Ranks for Alternate Materials** form. Follow these steps.

1 On the Current Materials form, select the material record for the primary material from the grid on the left side.

2 Click **Ranks**. The **Ranks for Alternate Material** form opens.

3 Select the record for the alternate material you want to re-rank and click the **Up** or **Down** button. For example, if you want to move the rank 1 material to rank 2, select the rank 1 material and click **Down**. The next-highest-ranking material moves up to the position of the material for which you changed the rank.

4 Select **Actions > Save** to save the changes.

NOTE: If you delete an item record that is a member of an alternate group, the materials that are lower in the rank structure for that group move up in rank accordingly. You cannot delete an item record if it is the primary material in an alternate group.

Planning the Fastest-Available Alternate Material

Select the **Use Latest Pull for Alternate Items** parameter on the **Planning Parameters** form to configure APS to plan the alternate item in a given alternate group that can be obtained or manufactured the fastest. See Use Latest Pull for Alternate Items for details about how the system plans alternate materials based on the setting of this parameter.

Identifying Alternate Materials in the Plan Output

Output Forms

When the system uses alternate materials, they are flagged on certain output forms and reports by using the Alternate field. The following forms and reports include this field:

- **Planning Detail**
- **Supply Usage APS**
- **Demand Detail Chart APS**
- **Job Materials**

- **Production Schedule Item Materials**
- **Production Schedule Release Materials**
- **Routing BOM Listing**

Reports

- **Indented Current BOM Report** - displays alternate materials for a given material when you select the Print Alternate Materials field before printing the report.
- **Item Current Routing Report** - displays the alternate materials for a given current material.
- **Item BOM Where Used Report** - includes a field labeled Alternate that identifies alternate materials.
- **Job BOM Report** - includes a field labeled Alternate that identifies job materials that resulted from alternate materials used in the current bill of material. See "Copying Planned Alternate Materials to the Production BOM" below for a description of this situation.
- **Production Schedule Routing Report** - includes a field labeled Alternate that identifies production schedule materials that resulted from alternate materials used in the current bill of material.
- **Exceptions Report** - includes a field labeled Alternate that identifies material demands that resulted from alternate materials used in the current bill of material.

Copying Planned Alternate Materials to the Production BOM

When the APS Planning activity plans a job, production schedule release, or MPS order that has no routing/bill of material, it plans using the item's current routing/BOM. In this situation, when you firm a planned order or MPS receipt that results from the job, PS release, or MPS order, any alternate materials the system used when it planned the current BOM will be copied to the job or PS BOM.

How the Preserve Pre-Released Production Dates Parameter Affects Alternate Usage in Jobs and Production Schedules

For Firm jobs with no routing/BOM or Planned production schedule release with no routing/BOM (and whose PS item has no routing/BOM), the setting of the Preserve Pre-Released Production Dates parameter determines whether the system uses any alternate materials from the current routing/BOM or only the primary materials. These situations come into play when the parent item has a current routing/BOM containing one or more materials defined with alternate materials, and the job/production schedule has no routing/BOM.

- Preserve Pre-Released Production Dates is NOT selected: the system uses the current BOM to plan the job/production schedule, and considers any alternates in the BOM.
- Preserve Pre-Released Production Dates is selected: the system uses the current BOM to plan the job/production schedule, but does NOT consider any alternates in the BOM; instead, only the primary materials will be used.

About Rollup of Alternate Material Costs to Standard BOM

When you roll up the cost of the current routing/BOM to the standard routing/BOM (using Current BOM Cost Rollup or Roll Current Cost to Standard Cost), the cost of alternate materials is NOT rolled up to the standard routing/BOM.

About Planned Orders Consolidation and Alternate Materials

If you are using planned orders consolidation using the Planned Orders Consolidation parameter on the Planning Parameters form, multiple planned orders (PLNs) generated by the APS Planning activity may be combined into a single PLN. In this situation, when you firm a consolidated PLN and copy the current routing/BOM to a job, the system uses the BOM from the earliest PLN within the consolidated PLN. If any alternate materials were used in that BOM, they are copied to the job.

Using Supply Usage Tolerance

This topic applies to APS.

When the system plans a demand, it begins by searching backward for supplies that are planned to be available between the demand's due date/time and the current date/time. If the supplies available during that time do not satisfy the demand quantity, the system searches for on-hand inventory. If the demand is still not satisfied, the system can then use the **Supply Usage Tolerance** to search for supplies that are planned to be available AFTER the demand's due date.

To set up supply usage tolerance, follow these steps:

1   Open the Planning Parameters form.

2   Select the **Advanced** tab.

3   Enable the **Use Supply Usage Tolerance** parameter.

4   Select **Actions > Save** to save the changes.

5   You can define a default, global tolerance value on the Planning Parameters form or you can define an item-specific tolerance value on the Items form.

    On either form, define the tolerance time window in the **Supply Usage Tolerance** field. The system uses a window of hours or days, depending on whether you enter a positive or negative number:

    • **Positive number**: the system searches for supplies starting from the demand's due date/time + the tolerance number of hours. For example, if the demand's due date is 3/5/2004 at 9:00, a value of 4 means the demand can use any supplies that are available between the current date/time and 3/5/2004 at 13:00.

    • **Negative number**: the system searches for supplies starting from the demand's due date at 00:00 (midnight) + (24 hours * the positive tolerance value). For example, if the demand's due date is 3/5/2004 at 15:00, a value of -4 means the demand can use any supplies that are available up to 3/9/2004 at 00:00. In the same example, a value of -1 means the demand can use any supplies available up to 3/5/2004 at 24:00 (the same day).

> **NOTE:** A value of 0 entered on the Items form bypasses the item-level tolerance; the system instead uses the global tolerance value.

6   Select **Actions > Save** to save the changes.

Exception Messages

When a tolerance supply is used, the "Move In Receipt (Tolerance)" exception message displays for that supply on the Planning Detail form and on the Exceptions Report. You will need to move the supply to the date specified in this exception message.

General Notes

- The system applies supply usage tolerance only if there are insufficient planned supplies and inventory available to satisfy the demand.
- The system uses a 24-hour day, 7-day week calendar when applying these values.
- If the system must use tolerance supplies, it uses as much of the tolerance supplies as possible before it uses any inventory or supplies available before the demand's due date.

EXAMPLE:

Consider this demand and supplies:

- Demand A: Qty 75 due 3/24/2004 15:00
- On-hand inventory: Qty 25 available 3/22/2004 00:00
- PO A: Qty 25 available 3/23/2004 13:00
- PO B: Qty 25 available 3/25/2004 13:00
- PO C: Qty 25 available 3/26/2004 13:00
- Supply Usage Tolerance: -2

When planning this demand, the system first searches backward from the due date and finds PO A. Then it finds the available quantity from on-hand inventory, for a total quantity of 50.

Because the demand quantity of 75 is not satisfied, the system searches forward from the due date and applies the Supply Usage Tolerance factor. Because Supply Usage Tolerance is -2, the system searches forward from the demand's due date at 00:00 to 48 hours after the due date. In this example, the -2 tolerance allows the system to find the quantity of 25 from PO B and satisfy the demand.
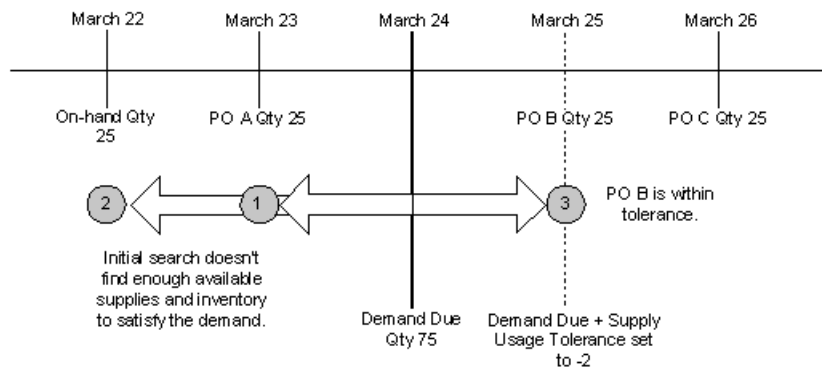
NOTE: If the Supply Usage Tolerance were -3, the system would have been able to use PO C. It would have used the 50 tolerance supplies from POs B and C plus the supplies from PO A to satisfy the demand (the on-hand inventory would not have been used).

Preserving Inventory and Supplies for Short-Term Demands

This topic applies to APS.

In some situations, demands may consume inventory and planned supplies earlier than necessary, causing shorter-term demands (for example, demands planned using Get ATP/CTP) to be late.

The method you should use to preserve inventory for these short-term demands depends on whether the item is manufactured or purchased.

Using Safety Stock (Purchased or Manufactured Items)

For purchased items, we recommend you use safety stock to ensure you have sufficient supplies to handle short-term demands. See How Safety Stock is Replenished for more information about using safety stock.

Using a Time Fence (Manufactured Items)

For manufactured items, you can use safety stock, as described above, or you can specify a Time Fence Rule for the item.

A time fence rule determines a boundary of time for preventing longer-term demands from consuming inventory and supplies. Demands due later than the time fence cannot deplete available inventory and supplies below a defined "preservation level" (which is based on the item's Safety Stock level). You can adjust the preservation level using the Preservation Level Multiplier field.

Valid Time Fence Rules are:

- **No time fence**: the time fence function is disabled.
- **Lead Time**: the length of the time fence is defined by the end item's lead time (Fixed Lead Time + (Variable Lead Time x order quantity)). If a PCAL shift is defined, the system calculates lead time according to that shift. Otherwise, it calculates lead time using 24 hours x 7 days a week.

Select this option if the time to replenish this item's quantity should be represented only by the end item lead time.

- **Accumulated Lead Time**: the length of the time fence is defined by the accumulated lead time for the end item + the lead times for all of its component items. If a PCAL shift is defined, the system calculates lead time according to that shift. Otherwise, it calculates lead time using 24 hours x 7 days a week. Select this option if the time to replenish this item's quantity should include the lead times of all the components (that is, the components may not typically be available).

- **Specific Value**: the length of the time fence is defined by the value in the Time Fence Value field (in days). The system calculates lead time using 24 hours x 7 days a week.

NOTE: To preserve the entire quantity of inventory and supplies inside the time fence when either the Safety Stock or Preservation Level Multiplier value is zero, select the Protected Lead Time, Protected Accumulated Lead Time, or Protected Specific Value time fence rules.

EXAMPLE:

Assume these conditions:

- Time Fence is set to Lead Time
- Item's lead time=5 days
- Safety Stock=40
- Preservation Level Multiplier=0.5
- On-Hand=0
- A purchase order for 50 is due at the current date + 4 days.
- A customer order for 50 is due at the current date + 6 days.

The time fence is defined by the item's lead time, which is five days. Because the customer order is due later than the item's time fence, it cannot use the "protected" portion of the planned supply due inside the time fence. The protected quantity of 20 is defined by the Safety Stock Ã— the Preservation Level Multiplier (40 Ã— 0.5=20). Therefore, the customer order can only consume 30 of the supply.

How APS Planning Uses the Time Fence

The system applies the time fence only during the pull-planning phase of APS Planning. If the system fails to plan the demand using pull planning, and must switch to push planning, it ignores the time fence and uses whatever inventory and supplies are necessary to satisfy the demand as soon as possible.

NOTE: Planned orders that the system generates to replenish safety stock will ignore the time fence.

During the planning process, the system may use or ignore the time fence, depending on the current conditions. The table below shows each of the planning iterations the system may perform and the corresponding treatment of the time fence.

Planning Pass	Description
A	Pull plan from the demand's Due date and use Time Fence. If the demand is a pull-up order, pull plan from the Request date. If pass A is successful, plan the next demand. If pass A fails, perform pass B.
B	Pull plan from the demand's Due date and ignore Time Fence. If the demand is a pull-up order, pull plan from the Request date. If pass B is successful, plan the next item. If pass B fails and demand is a pull-up order, perform pass C. If pass B fails and demand is not a pull-up order, perform pass E.
C	(Pull-up orders only.) Pull plan from the Due date and use Time Fence. If pass C is successful, perform additional pull-planning iterations between the Due date and Request date to try to project a date that is closer to the Request date. If pass C fails, perform pass D.
D	(Pull-up orders only.) Pull plan from the Due date and ignore Time Fence. If pass D is successful, perform additional pull-planning iterations between the Due date and Request date to try to project a date that is closer to the Request date. If pass D fails, perform pass E.
E	Push plan from the current date (Time Fence is ignored during a push). If pass E is successful (that is, if the system was able to plan a projected completion date within the Plan Horizon), perform pass F. If pass E fails, perform pass G.
F	Pull plan again from the projected date calculated by the push plan and use Time Fence. If pass F is successful, perform iterative pull-planning using the projected date from the push as the end of the iterations time window. If pass F fails, perform pass G.
G	Pull plan from the end of the Plan Horizon and ignore Time Fence.

	If pass G is successful, perform iterative pull-planning using the end of the Plan Horizon as the end of the iterations time window. If pass G fails, mark the item as "Blocked" and begin planning the next item.
iterative pull planning	Perform one or more pull-planning iterations within a defined time window, dividing the window in half with each iteration until a feasible plan is found that is within the Planning Pull Tolerance or ATP/CTP Pull Tolerance number of days of the need date. The beginning of the time window is always the demand's need date. The end of the time window will be either the projected completion date from pass E or the end of the Plan Horizon. For example, the first iteration pulls from the midpoint between the projected date and the need date. If that pull succeeds, the next iteration pulls from the midpoint between that new projected date and the need date. The process incrementally moves closer to the need date until it finds a plan that works (that is, doesn't calculate a start date in the past) and has a projected completion date that is within the Pull Tolerance days of the need date.

NOTE: Passes B and D will be run only if there are items in the BOM with the Time Fence defined. Time fences are ignored in passes B and D for Manufactured items only.

Enforcing the Time Fence at the Expense of the Due Date

If you are more concerned with preserving inventory and supply than with meeting the due date, you can disable pass B so APS always uses the Time Fence. To disable this pass, select the Suspend Time Fence (Second Pull) planning parameter. Only manufactured items can suspend the time fence.

Refreshing the APS Plan to Reflect Changes

This topic describes the types of information that update the APS plan and whether the information can update the plan incrementally or requires APS Planning to be rerun to update the plan.

Incremental Changes

The system inserts some transactions, such as customer orders, into the APS plan incrementally when you create them or save changes to them. For these non-disruptive incremental transactions, the system dynamically keeps the plan up to date. See About Incremental Planning and ATP/CTP for a list of these transactions.

Planning Parameters Require Replanning

When you create, delete, or make changes to some other transactions, or change the Planning Parameters, the system does not actually apply these changes to the plan until you rerun APS

Planning. This delay allows you to choose when to disrupt the existing plan with the new information. See Running APS Planning for steps.

Transactions Requiring Replanning

When you create, delete, or change these types of transactions, you must run APS Planning to reflect the changes in the plan.

- Safety stock orders
- Purchase Orders, PO requisitions, transfer orders, and jobs (only changes to existing transactions require replanning)
- Forecast and MPS orders that are not incrementally planned with the Get ATP/CTP process
- Changes to resources, resource groups, effectivities, holidays, shifts, items, and routings/bills of material

Planning a Job's Operations

This topic applies to APS.

To plan an individual new job and view the details of how it will be completed, you can use the Get ATP or Get CTP button on the Job Orders form. Follow these steps:

1   On the Job Orders form, select **Actions > New** to create a new job.

2   Enter the required fields, including the item to be produced and a Start date and/or End date.

    NOTE: If you enter a Start date, the system plans forward by the item's lead time to arrive at a default End date. If you enter an End date, the system plans backward by the item's lead time to arrive at a default Start date. The Get ATP/CTP calculation will plan to the End date, so make sure the End date is the desired date before you click the Get ATP/CTP button.

3   Click the **Get ATP** or **Get CTP** button. The Availability Results form displays the system's calculated Projected completion date for the job based on current resource capacity and the job's End date. When you perform Get ATP/CTP on a job order, the system does not use on-hand inventory or planned supplies to satisfy the end-item demand (however, inventory and supplies are used to satisfy the component demands).

4   Click the **Plan Detail** button. This button displays the job's inventory and supplies usage and manufacturing requirements for each level of the bill of material.

    See the Demand Detail Chart APS help topic for descriptions of the buttons, IDs, and other conventions used on this view.

5   When you are finished examining the detailed plan, close the Plan Detail form to return to the Availability Results form.

6   Accept the Projected date displayed on the Availability Results form by clicking **Yes** or **OK**. The system inserts the job into the APS plan incrementally using the calculated Projected date as the job's new End date.

About Blocked Demands

This topic applies to APS.

When the APS Planning activity projects that a demand cannot be planned in the time between the due date and the current system time (that is, the demand will be late), it push plans the demand forward from the current date out to an as-soon-as-possible date. If, during this push plan, the system cannot plan the demand to be complete before the end of the Plan Horizon, the demand is "blocked," and cannot be planned. The "blocked" message may appear on the Planning Detail form.

Avoiding Blocked Demands

To avoid blocked demands, try these solutions:

- The easiest solution is to increase the length of your Plan Horizon on the Planning Parameters form.

    NOTE: We recommend you specify the same amount of time for the Plan Horizon and the Days to Schedule value on the Shop Floor Control Parameters form, which acts as the horizon for the Scheduler (note that the Plan Horizon is expressed in hours).

- Increase the length of the shift intervals for the appropriate Resources (do this on the Shifts tab on the Resources form).
- For the item on the blocked demand, review the purchased item lead times to see if they are realistic and adjust them if necessary.
- For the item on the blocked demand, review the operation times to make sure they were correctly defined and fix them if necessary.
- For the item on the blocked demand, check the Resources tab on the Current Operations and/or Job Operations form and set the Break Rule to **Shifts**.

How APS Replenishes Safety Stock

This topic describes how APS plans safety stock replenishment. See MRP Overview for a description of how MRP plans safety stock.

APS will plan to keep inventory at or above safety stock. When safety stock is set up correctly, the system will generate ONE safety stock replenishment order for any item that drops below safety stock with the following attributes:

- Order Quantity - The order quantity, adjusted for the item's order minimum and multiple values, will ensure the inventory level remains at or above safety stock over the whole planning horizon.
- Projected Date - The projected date of the safety stock order is calculated as APS normally does for purchased (using all the lead times applied to the PCAL) and manufactured items (using the item's BOM).
- Due Date - The due date of the safety stock is calculated several ways. See the Due Date section below for more details.

Due Date Calculation

For purchased Items:

Due date = Date & Time of APS plan + Lead time (using the PCAL shop calendar)

Lead time = Fixed + Dock-to-stock + Paperwork lead times

For manufactured items:

Due date = Date & Time of APS plan + Lead time, using the PCAL shop calendar

Lead time = Fixed + Dock-to-stock + Paperwork + (Variable * Safety Stock level).

Note: The safety stock level in the lead time formula for manufactured items is the total level you are attempting to maintain (as shown in the Safety Stock field on the Items form), and not the shortfall amount when on-hand dips below safety stock.

Safety Stock for Manufactured Items

When you run APS Planning, the system plans safety stock replenishment for manufactured items according to one of two processes: **Post Process** or **Dynamic**. The system automatically selects which process to use for an item based on either the relationship between Order Minimum and Safety Stock Level, or the relationship between Order Multiple and Safety Stock Level.

If the Order Minimum/Order Multiple (whichever is greater) is...	The system uses this behavior...
Greater than Safety Stock	Dynamic
Less than or equal to Satefy Stock	Post Process

Dynamic Safety Stock Behavior

During the APS planning run, as each demand is planned, the item's safety stock level is evaluated. If a demand causes safety stock to dip below the safety stock level:

- A safety stock order is planned for that item.
- Part of the order minimum/order multiple is reserved for safety stock. The remainder is available to other demands during the planning run.
- Depending on the current inventory level, dynamic safety stock behavior can sometimes be planned immediately. Unlike Post Process behavior, you can have safety stock plans inside the item's time fence.

Once safety stock is planned for an item using dynamic behavior, the Time Fence is turned off. Time Fence is no longer needed since the Safety Stock Order protects the safety stock quantity.

Post Process Safety Stock Behavior

After all demands, or orders, are planned, the system plans safety stock for each item in order by Low Level Code, from low to high. For each item, if the inventory falls below the safety stock level, outside of the time fence, the system creates a Safety Stock plan at the point in time with a quantity equal to the difference between safety stock level and the lowest projected inventory level outside of the Time Fence.

Avoiding Too-large, Too-early Replenishment Quantities

For manufactured items, it is possible that in some situations (when you have demands due far into the future that use up your near-term supplies), the system may generate a safety stock planned order that is due much earlier than the demands need it, leaving you with a large quantity of unnecessary supplies.

To avoid this problem, we recommend you set the Time Fence Rule to **Accumulated Lead Time** for the item on the Items form. By setting this Time Fence Rule, the later demands will not use the near-term supplies and the system will create planned orders due closer to when the demands are actually due.

Safety Stock for Purchased Items

After the system finishes planning all the demands normally, according to order priority, it performs a second, time-phased planning run. At the current date and at every date where there is a demand for the item, the system compares the on-hand quantity with the safety stock value:

1   If on-hand is not below safety stock, the system continues planning normally according to the Purchased Supply Switching/Generate Purchase Order Exceptions functionality.

2   If on-hand is below safety stock, the system searches for existing planned supplies to satisfy the demand.

3   If sufficient planned supplies are available to satisfy the entire demand quantity, the system allocates the supplies to the demand instead of allocating on-hand inventory. Safety stock is preserved without requiring a safety stock planned order.

4   If sufficient supplies are NOT available, the system generates a new planned order at the earliest possible date to cover the safety stock shortage and the demand quantity. The system also generates the "On Hand Below Safety Stock" exception message. The due date of the planned order is set to the current date + standard lead time. The planned order quantity is set to the difference between safety stock and the projected on-hand at the current date + lead time.

Once the level is at or above safety stock, demands due later than the current date + standard lead time cannot reduce the level back below safety stock.

NOTE: The system generates only a single safety stock planned order for a given item (it does not generate a planned order for each instance where the on-hand level drops below safety stock).

Safety Stock for Transferred Items

The system plans safety stock for transferred items the same way it plans safety stock for purchased items.

Parameters Related to Safety Stock Replenishment

The following parameters appear on either the Planning Parameters form (and affect ALL items) or on the Items form. They either affect the way the system generates planned orders to replenish safety stock or the system uses them along with the safety stock value to calculate a value used for another feature.

Parameter	Appears On
Consider Negative On Hand	Planning Parameters
Preservation Level Multiplier	Planning Parameters
Suspend Time Fence (Second Pull)	Planning Parameters
Order Minimum	Items
Time Fence Rule	Items
Time Fence Value	Items

About Reorder Point Items and Safety Stock

Reorder Point items are usually inexpensive, high-volume items (such as nails, bolts, etc.) that you want to track and replenish differently than normal items. The system does not generate safety stock replenishment planned orders for Reorder Point items. However, the "On Hand below Safety Stock" exception is generated when the system creates a reorder-point planned order. See the Reorder Point topic for more information.

How APS Interprets Job Status

Each Infor CloudSuite demand transaction (such as a job order, estimate job order, or production schedule) has astatus code to indicate its progress in the production cycle. For example, a job may go through these stages:

- PLN - a planned order created by APS to fulfill a demand. These orders appear on the Planning Detail and Material Planner Workbench forms.
- Firm - the default value for new jobs. The job has been entered for planning purposes. You "firm" a PLN to create a job with a status of Firm. For estimate jobs, this status is Working. For production schedule items, this status is Planned.
- Released - you release the job when it is available for production.
- Scheduled - the job has been scheduled in the Scheduler.

APS plans demands differently based on this status code. The status code changes the date the demand consumes any required materials and the date the completed supply will be available.

Status	Quantity	Material Components Consumed at...	Job Supply Available at...	Description
PLN	n/a	Job's projected start date. This date is controlled by APS and is not visible in Infor CloudSuite. This is the date the system "thinks" the job can start, based on the latest plan data. This date may change.	Job's projected end date (controlled by APS)	Planned orders display on the Planning Detail and Material Planner Workbench forms.
Firm, not scheduled AND Preserve Pre-Released Production Dates parameter not selected	Fixed	Job's projected start date (controlled by APS).	Projected date (displayed to the user in the Projected field)	The lack of a component or resource capacity on an operation may push the job start or end date out.
Firm, not scheduled AND Preserve Pre-Released Production Dates parameter selected	Fixed	Job's Start date (user-entered)	End date (calculated with lead time or by incremental planning)	APS plans the operations, and if they extend past the job End date, it generates an exception message.
Released, not scheduled AND Plan Materials at Operation Start parameter not selected				
Released, not scheduled AND Plan Materials at Operation Start parameter selected	Fixed	Job operation's Start date	End date (calculated with lead time or by incremental planning)	APS plans the operations, and if they extend past the job End date, it generates an

				exception message.
Scheduled (Firm or Released)	Fixed	Job operation's Start date or the Job Start date if the operation Start date is blank	End date (calculated with lead time or by incremental planning)	At this point, the Scheduler takes full control of the job.

About APS Operation Splitting

Some manufacturing operations can be completed more quickly if the operation quantity is divided into smaller groups, known as splits. Each split has the potential to be processed simultaneously by multiple allocations of the resources required at the operation. For example, in the molding industry, this might happen if multiple molds for the same item are available to be used at the same time. The operation model used by APS Planning, and Scheduling, supports operation splitting through the use of the Split Rule, Split Size, and Split Group fields. When an order quantity is split at an operation in this way, the portion of the total operation time that is based on the order size will be divided among the split quantities according to their relative size. The resources required at the operation must be allocated, and setup, for each split.

Note: If there are more splits created than there are available members from the required resource groups, the splits are processed serially by the resources that are able to be allocated. If the operation uses a fixed step time, rather than per piece, each split requires a step time equal to [step time * split size / total demand size].

Splits are identified in the APS Planner output by creating separate JOBPLANnnn records for each split at the operation level.

Split Rule	Split Name	Description
0 (default)	No Splitting	The operation will be completed without splitting the order quantity.
1	Split Size	The order is processed at this operation in split quantities specified by the Split Size. If the order quantity is not evenly divisible by the Split Size, any remainder will be processed as a separate split amount.
2	Split Loads	The Split Size indicates the number of splits into which

		the order is divided at this operation. The size of each split is calculated by (Order Size / Split Size), adjusted for the current precision. The size of the final split will be adjusted to make the sum of the split quantities match the original order quantity.
3	Split Group	The resource group specified by Split Group will be examined. The number of members in this group that are available at the start date of the operation (or end date when pull planning) determines the number of splits into which the order quantity will be divided. The size of each split is calculated by (Order Size / # of available group members), adjusted for the current precision. The size of the final split will be adjusted to make the sum of the split quantities match the original order quantity.
4	Split All Group	The resource group specified by Split Group will be examined. The number of members in this group determines the number of splits into which the order quantity will be divided. The size of each split is calculated by (Order Size / # of group members), adjusted for the current precision. The size of the final split will be adjusted to make the sum of the split quantities match the original order quantity.

EXAMPLE: Consider the following example operation:

Setup time = 1 hour, Run time = 0.1 hour per piece

Requires one resource from the Mold resource group, which has two members

Order Quantity = 100

Without splitting, the operation would allocate one member from the Mold resource group. The total operation time would be Setup time plus (Run time) x (Order Qty); or 11 hours. However, if we configure this operation to allow splitting using Split Rule 4 and Split Group Mold, the operation will divide the order into two splits of size 50 and (depending on resource availability) allocate both members from the Mold resource group. Assuming no other contention for these resources, the total operation time would be Setup time plus (Run time) x (Split Qty); or 6 hours. 1 hr. 5 hrs.

Limitations

Split quantities do not persist outside the context of the operation.

Operation buffer in and buffer out are unaffected by operation splitting.

The operation following a split operation cannot use offset. Any offset specified will be ignored with a planner warning.

Overlapping Operation Processing - APS

This topic applies only to APS.

You define overlap on an operation to represent the number of run hours the previous operation must complete before this operation can start. The system moves back the operation's start and end dates to reflect this overlap. It then makes further adjustments to the operation's dates based on the following circumstances:

1   Considers that the first operation may split across breaks for other operations (as defined in the Break Rule for the operation) and makes the necessary adjustment.

2   Ensures the second operation does not end before the first operation. If the difference between the second operation's new start date/time and the end of the first operation is greater than the total duration of the second operation, the system adjusts the horizon again so the second operation cannot finish before the first operation.

If you run the Scheduler after running APS Planning, the Scheduler performs its overlap processing based on the same Offset value.

Setting Up Safety Stock

Define Safety Stock

1   On the **Item/Warehouse** form, enter desired safety stock levels for your items.

2   On the **Items** form, enter values for **Time Fence Rule**.

a   For all Items where Source = Manufactured:

> o   If safety stock > 0, set the **Time Fence Rule** equal to "Lead Time." See topic below to determine if you need to use "Accumulated Lead Time." Do NOT use "Specific Value."
>
> o   If safety stock = 0, set the **Time Fence Rule** equal to "No Time Fence."

b   For all Items where Source = Purchased, set the **Time Fence Rule** equal to "Lead Time."

3   On the Planning Parameters form:

a   Clear the Suspend Time Fence (Second Pull) check box.

b   Set Preservation Level Multiplier equal to "1."

Using Accumulated Lead Time for manufactured Items

Normally, if a manufactured item has safety stock, you will use set its **Time Fence Rule** to "Lead Time." However, you should consider using "Accumulated Lead Time" when:

- You cannot assume purchased items in the item's BOM will usually be in stock.
- You are getting safety stock replenishment quantities that are too early and too large.

Writing a Custom Operation Calculation

You can write a custom C routine for APS to calculate operation duration for selected operations. The system calls your custom calculation routine if the operation's Custom Planner Rule field is selected.

About the Standard Operation Calculation Routine

The standard operation calculation routine is ol_opercalc. By default, it returns the value -1.0, which signals the algorithm to use the standard (that is, non-custom) calculation to determine the operation's duration. The C code for this routine is shown below.

```
#include "ol_api.h"
double
ol_opercalc(opercalc)
opercalc_s* opercalc;
{
return(-1.0);
}
```

Input to the Standard Routine

The input to ol_opercalc is a pointer to an opercalc_s structure. As shown below, this structure contains information used to calculate operation duration.

```
/*-------------------------------------------------------------------------*/
typedef struct attid_struct
/*-------------------------------------------------------------------------*/
{
 char                    attid[MAX_OLXFSTR+1];
 char                        attvalue[MAX_OLXFSTR+1];
}
attid_s;
/*-------------------------------------------------------------------------*/
typedef struct reslist_struct
/*-------------------------------------------------------------------------*/
{
 char                    resource[MAX_OLXFSTR+1];
 char                    category[MAX_OLXFSTR+1];
 double             catbufpre;
 double             catbufpost;
 long               numresattids;
 attid_s**      resattidlist;
}
reslist_s;
/*-------------------------------------------------------------------------*/
typedef struct opercalc_struct
/*-------------------------------------------------------------------------*/
{
 char                            operation[MAX_OLXFSTR+1];
 char                     order[MAX_OLXFSTR+1];
 char                     part[MAX_OLXFSTR+1];
 double                 quantity;
 char                   startwindow[14];
 char                   endwindow[14];
 long                   oprflags;
 double                 oprsetup;
 double                 oprcycle;
 double                 oprbufpre;
```

```
    double                          oprbufpost;

    long                            oprovltype;

    double                          oprovlvalue;

    long                                  matltag;

    long                            numresources;

    reslist_s**     resourcelist;

    long                            numoprattids;

    attid_s**              oprattidlist;

    long                            numordattids;

    attid_s**              ordattidlist;

    long                            numprtattids;

    attid_s**              prtattidlist;

    }

    opercalc_s;
```

Output from the Standard Routine

There are two types of output from ol_opercalc:

- The function's return value. The expected return value from ol_opercalc is either the total operation duration in hours (as type double) or the value -1.0 (or any negative value). A negative value signals the system to use the standard (non-custom) operation calculation.

- A set of three parameters. These parameters are part of the opercalc_s structure:

    - oprsetup - Operation setup time (hours)
    - oprovltype - Operation overlap type
    - oprovlvalue - Operation overlap value

When the algorithm passes these parameters to ol_opercalc, the parameters contain the user-specified values from the database. You can modify them within ol_opercalc before returning them back to the algorithm. If they are modified, the system will respond as follows:

- oprsetup - The setup time will be changed for this operation.
- oprovltype - The overlap offset will be recalculated for this operation.
- oprovlvalue - The overlap offset will be recalculated for this operation.

You can enable operation overlapping through the original database value or by modifying oprovltype. If it is enabled, and if oprsetup is modified and/or the ol_opercalc return value denotes a different oprcycle value is in effect (considering setting of the operation's Fixed Schedule Hours and Custom Planner Rule fields), the system will recalculate the overlap offset for this operation.

Writing Your Custom Routine

When you write your routine, make sure the return value is of type double. The return value must represent the total required operation duration (in hours), for the specified number of parts using the specified resources, during the time interval available for the production.

The following example ol_opercalc routine determines the operation time for a particular resource.

```
#include "ol_api.h"
double
ol_opercalc(opercalc)
opercalc_s* opercalc;
{
     FILE* log_fp;
     int i,j;
  double dTime;
    log_fp = fopen("d:\\opercalc50.txt","a");
   fprintf(log_fp,
                "\nopercalc:  oper=>%s&LT\n",
                opercalc->operation );
         fflush(log_fp);
   fprintf(log_fp,
                "opercalc:  numoprattids=%d\n",
                opercalc->numoprattids );
         fflush(log_fp);
    for (i=0;i&LTopercalc->numoprattids;i++)
         {
    fprintf(log_fp,
     "opercalc:  opr attid   =>%s&LT\n"
     "opercalc:  opr attvalue=>%s&LT\n",
                opercalc->oprattidlist[i]->attid,
     opercalc->oprattidlist[i]->attvalue );
            fflush(log_fp);
         }
   fprintf(log_fp,
                "opercalc:  order=>%s&LT\n",
                opercalc->order );
         fflush(log_fp);
```

```
        fprintf(log_fp,
                "opercalc:   numordattids=%d\n",
                opercalc->numordattids );
        fflush(log_fp);
    for (i=0;i&LTopercalc->numordattids;i++)
        {
    fprintf(log_fp,
                "opercalc:   ord attid    =>%s&LT\n"
    "opercalc:   ord attvalue=>%s&LT\n",
                opercalc->ordattidlist[i]->attid,
    opercalc->ordattidlist[i]->attvalue );
            fflush(log_fp);
        }
    fprintf(log_fp,
                "opercalc:   part=>%s&LT\n",
                opercalc->part );
        fflush(log_fp);
    fprintf(log_fp,
                "opercalc:   numprtattids=%d\n",
                opercalc->numprtattids );
        fflush(log_fp);
    for (i=0;i&LTopercalc->numprtattids;i++)
        {
    fprintf(log_fp,
            "opercalc:   prt attid    =>%s&LT\n"
    "opercalc:   prt attvalue=>%s&LT\n",
                opercalc->prtattidlist[i]->attid,
    opercalc->prtattidlist[i]->attvalue );
            fflush(log_fp);
        }
        fprintf(log_fp,
                "opercalc:   quantity=%f\n",
                opercalc->quantity );
        fflush(log_fp);
        fprintf(log_fp,
```

```
                    "opercalc:   start=>%s&LT\n",
            opercalc->startwindow );
    fflush(log_fp);
    fprintf(log_fp,
            "opercalc:   end=>%s&LT\n",
            opercalc->endwindow );
    fflush(log_fp);
    fprintf(log_fp,
            "opercalc:   oprflags=%d\n",
            opercalc->oprflags );
    fflush(log_fp);
    fprintf(log_fp,
            "opercalc:   oprsetup=%f\n",
            opercalc->oprsetup );
    fflush(log_fp);
    fprintf(log_fp,
            "opercalc:   oprcycle=%f\n",
            opercalc->oprcycle );
    fflush(log_fp);
    fprintf(log_fp,
            "opercalc:   oprbufpre=%f\n",
            opercalc->oprbufpre );
    fflush(log_fp);
    fprintf(log_fp,
            "opercalc:   oprbufpost=%f\n",
            opercalc->oprbufpost );
    fflush(log_fp);
    fprintf(log_fp,
            "opercalc:   oprovltype=%d\n",
            opercalc->oprovltype );
    fflush(log_fp);
    fprintf(log_fp,
            "opercalc:   oprovlvalue=%f\n",
            opercalc->oprovlvalue );
    fflush(log_fp);
```

```
        fprintf(log_fp,
                "opercalc:  numresources=%d\n",
                opercalc->numresources );
        fflush(log_fp);
  for (i=0;i&LTopercalc->numresources;i++)
        {
 fprintf(log_fp,
                "opercalc:  resource=>%s&LT\n",
                opercalc->resourcelist[i]->resource );
           fflush(log_fp);
 fprintf(log_fp,
                "opercalc:  category=>%s&LT\n",
                opercalc->resourcelist[i]->category );
           fflush(log_fp);
           fprintf(log_fp,
                   "opercalc:  catbufpre=%f\n",
                   opercalc->resourcelist[i]->catbufpre );
           fflush(log_fp);
           fprintf(log_fp,
                   "opercalc:  catbufpost=%f\n",
                   opercalc->resourcelist[i]->catbufpost );
           fflush(log_fp);
     fprintf(log_fp,
                   "opercalc:  numresattids=%d\n",
                   opercalc->resourcelist[i]->numresattids );
           fflush(log_fp);
     for (j=0;j&LTopercalc->resourcelist[i]->numresattids;j++)
           {
 fprintf(log_fp,
     "opercalc:  res attid   =>%s&LT\n"
     "opercalc:  res attvalue=>%s&LT\n",
                 opercalc->resourcelist[i]->resattidlist[j]->attid,
       opercalc->resourcelist[i]->resattidlist[j]->attvalue );
             fflush(log_fp);
           }
```

```
        }
   dTime = -1.0;
   if ( (!strcmp(opercalc->part,"SA-50910")) &&
      (!strcmp(opercalc->operation,
              "SA-50910                        SA-5.20")) &&
      (!strcmp(opercalc->resourcelist[0]->resource,"PNT10.1")) )
   {
    if ( opercalc->oprflags == 2 )
             {
      fprintf(log_fp, "opercalc:  per cycle\n");
      fflush(log_fp);
      if ( opercalc->quantity > 10.0 )
      {
          opercalc->oprsetup = 0.15;
       fprintf(log_fp, "opercalc:  changing oprsetup\n");
       opercalc->oprcycle = 0.25;
       fprintf(log_fp, "opercalc:  changing oprcycle\n");
       opercalc->oprovltype = 1;
       fprintf(log_fp, "opercalc:  changing oprovltype\n");
       opercalc->oprovlvalue = opercalc->quantity / 2;
       fprintf(log_fp, "opercalc:  changing oprovlvalue\n");
       opercalc->oprbufpre = opercalc->quantity / 2;
       fprintf(log_fp, "opercalc:  changing oprbufpre to qty/2=%f\n",
                        opercalc->oprbufpre);
       opercalc->oprbufpost = opercalc->quantity / 4;
       fprintf(log_fp, "opercalc:  changing oprbufpost to qty/4=%f\n",
                        opercalc->oprbufpost);
//      dTime = opercalc->oprcycle * opercalc->quantity;
       fflush(log_fp);
      }
             }
    else
             {
      fprintf(log_fp, "opercalc:  per load\n");
      fflush(log_fp);
```

```
    dTime = 1.0;
                /* opercalc->oprsetup = 0.0;
                opercalc->oprcycle = 0.1;
                opercalc->oprovltype = 1;
                opercalc->oprovlvalue = 3.0; */
        }
    }
    fprintf(log_fp, "opercalc:  dTime = >%f&LT\n", dTime );
        fflush(log_fp);
    fclose(log_fp);
    return(dTime);
}
```

Creating the Opercalc.dll for the Custom Routine

The Infor CloudSuite setup program installs the standard version of the opercalc50.dll into your \winnt\system32 directory. This dll contains a dummy version of the ol_opercalc routine. You must create a customized opercalc50.dll containing your custom ol_opercalc routine that will be used instead of the standard opercalc50.dll.

To create this dll, follow these steps:

1   Create a new empty Win32 Dynamic Link Library project in Visual C++.

2   Move your Microsoft C source code file into the project directory.

3   Add the source code file to the Source Files folder of the project. Make sure the return value is of type double. The return value must represent the total required operation duration (in hours), for the specified number of parts using the specified resources during the time interval available for the production.

4   Move the definition file (shown below) into the project directory. If there is a Definition Files folder, add the definition file to that folder. You may have to create the Definition Files folder.

```
;--------------------------------------------------
; OPERCALC50.DEF DLL library module definition file
;--------------------------------------------------
LIBRARY OPERCALC50 INITINSTANCE
DESCRIPTION 'SyteAPS V5.0 OperCalc', Copyright © 2010 Infor. All
rights reserved. www.infor.com'
;
EXPORTS
```

```
ol_opercalc = _ol_opercalc@4

_ol_opercalc = _ol_opercalc@4
```

5   Make adjustments to the project settings. For example, you must:

   - Name the resulting dll file opercalc50dll.
   - Identify where the header file ol_api.h can be found. This reference is required because the declaration of the structure being passed (opercalc_s) resides in this header file. It can be referred to as $(OLXDIR50)\include.

   You must compile the code with the following code generation options to match those expected by the system's executable call:

   - __stdcall calling convention
   - multithreaded
   - 8 byte struct member alignment

6   Build the project in either the debug or release form (there are separate settings for each). Messages should appear in the Build tab if there are any problems. If there are problems, modify the source code or project settings to fix them.

7   Move the new opercalc50.dll file to the folder for the associated Planner project on the Planning server. For example, if the project is named Alt000, place the dll in \Planner\Projects\Alt000.

NOTE: When you delete an APS Project, all of its folders and files are deleted, including the opercalc50.dll. Therefore, be careful never to put your Visual C++ source code (as mentioned in step 1) in the project folder.

Invoking Your Custom Routine

When APS runs, it uses your custom routine only if the operation's JOBSTEP.STEPTMRL field is set to **2** (Custom Planner Rule selected, Fixed Schedule Hours contains a value) or **3** (Custom Planner Rule selected, Fixed Schedule Hours blank or 0). An operation with a STEPTMRL value of 2 uses fixed cycle time; a value of 3 uses per-piece cycle time.

If the operation's Custom Planner Rule is cleared, the system will not call the custom ol_opercalc routine.

Using APS to Backward Schedule

The Scheduling activity generates an intelligent and accurate schedule that makes efficient use of your resources. The Scheduling activity schedules forward in time, simulating the load that actually flows through your shop floor (see How Event-Based Scheduling Works for a detailed description of the scheduling process).

To optimize the resource usage in this manner, the Scheduling activity must see all the simultaneous demands for the resources; therefore, you must run it independently of the APS Planning activity. As such, it does not support "real-time" scheduling of new demands.

If you are more interested in quick and more real-time scheduling than in resource optimization, you may consider using the backward scheduling capabilities of the APS Planning activity. APS produces a simple backward schedule to generate planned orders (see About the Planning Process for a detailed description of the APS planning algorithm). With the **Use Planning Output for Scheduling** option, you can use this planning data for your schedule. In this situation, scheduling is done simultaneously with planning and you can observe the real-time effects on the usual scheduling output forms and reports.

NOTE: Using this method to generate your schedule may leave your resources idle when there is work for them to perform. For the optimum utilization of your resources, we recommend you run the Scheduling activity instead of using this method.

Setup

The system must be in Infinite APS or APS planning mode. The MRP planning mode does not support this feature.

To set up the system to send planning output to the scheduling analysis forms and reports, select the **Use Planning Output for Scheduling** parameter, located on the Advanced tab on the Planning Parameters form.

When this parameter is selected, you cannot run the Scheduling activity to generate a schedule.

Generating the Schedule

To generate the full schedule, run APS Planning. The planning results are loaded automatically into the database tables used by the Scheduling output forms and reports. In addition, the job operation start and end dates calculated by APS Planning are displayed on the Job Operations form.

To update the schedule for incremental changes to the plan (such as for the addition of new orders, jobs, and Get ATP/CTP plans), open the Update Schedule form. Click the **Update Schedule** button to load the incremental plan changes into the Scheduling output forms and reports.

NOTE: The system updates this incremental plan data in the Scheduling forms and reports automatically the next time you run APS Planning. Use the Update Schedule form only if you need to see this plan data between runs of APS Planning.

See APS Overview for a description of the criteria used to generate this schedule output.

Viewing Scheduling Output

After running APS Planning, you can view scheduling output on these forms and reports:

- Resource/Resource Group Dispatch List report
- Resource Utilization
- Resource Group Utilization
- Resource Schedule
- Resource Group Schedule
- Resource Sequencing
- Resource Group Sequencing

- Resource Gantt Chart - Scheduler

The Scheduling activity generates schedule data that displays on additional output forms and reports that are not supported by the Use Planning Output for Scheduling option. For the complete list of Scheduler output forms and reports, see Analyzing Scheduler Output.

Using the Batch Definition Tree

Right-click on an ID in the tree to open the **Batched Productions** form for that batched production.

Right-click on a Job/Production Schedule to open the Job or Production Schedule Operations form for the batch operation.

Right-click on an operation in the tree to open the **Batch Definition Operations** form for that operation.

Filtering APS Messages

You can use the **View Planning Messages** form to see all the APS messages. The messages are categorized as Warning, Blocked or Error. The grid lists all APS messages based on your filter selections. Follow these steps to filter the APS messages:

1   Open the **View APS Messages** form. The form launches in Filter-in-Place mode.

2   Choose the type of messages you want to include and select the appropriate check box(es):

- Show Error Messages
- Show Warning Messages
- Show Blocked Messages

3   Set additional filters by selecting an Alternative, Message Number, Item, or Demand.

4   Turn off Filter-in-Place to populate the grid based on the filters.

APS Planning by Charge

Charges are items that are consumed by other demands immediately after being manufactured. Because the charge item cannot be stocked for later use, the APS Planner must process them differently.

- Job orders that produce charge items are planned as normal.
- Demands for charge items cannot be satisfied from inventory. Instead, they must be tied to existing job supply orders, or they must create new PLNs.
- Demands for charge items must be planned to use the supply of the item as close, in time, as possible to the end date of the job supply. This is accomplished by push planning demand orders from the supply date of their corresponding charge item supply.
- Only manufactured items can be identified as charges.
- Safety stock is ignored for all charge items.

- Charge items are not stocked, produced, or consumed at distribution warehouses.
- If job orders with component requirements for charge items are not cross-referenced to their supply orders, a warning message states that you the charge item requirement will be ignored by the Planner.
- Time fences are ignored for charge items.

About APS Order Batching

Order batching is used by the APS Planner to represent orders that share operations at the start of their routes, also known as co-jobs. For example, while a single molding fixture may contain several distinct molds, each of those molds share a single injection molding operation. Each order in the batch is pull planned from their due dates.

Note: APS only supports batch operations that belong to co-jobs. Batches that are manually created on the Batched Production form, are not processed by the APS Planner.

Sending APS Files to Support

If you need to send APS data to Infor Support:

1 Open the APS Support Files form.

2 Specify the Upload URL provided to you by Infor Support, or leave the field blank to save the archive locally. If you do not know your URL, contact your Infor Support representative.

3 Specify the File Name Prefix, which Infor will use to help identify your data. Typical prefixes are company, or subdivision, names.

4 Select Gather Error and Trace Files to include Scheduler error and trace files in the archive.

5 Select Generate APS Data Files to include the contents of the SQL tables that are used directly by APS.

6 Specify an alternate set of planning data, or accept the default production plan (alternative 0).

7 Press Submit Task to create the archive and either send it to Infor Support or save it locally. After each archive is sent to Support, it is deleted from the local machine.

Using Master Production Schedules

Using a Master Production Schedule

The master production schedule (MPS) allows you to control production of key "MPS items" to help you protect your schedule from fluctuations in order-based demand (forecasts, customer orders, parent job orders, etc.). MPS is a manually created, anticipated build schedule for an item. You create it based on your expectations of demand and your estimation of resource capacity.

You maintain MPS using the Master Production Schedule form and the MPS Processor utility.

Defining MPS Items

Before you can create an MPS for an item, you must select the **MPS Flag** on the Items record for that item.

Not all items should be controlled by MPS. For example, you might use MPS to plan items for which the customer demand changes seasonally; for this item, you may want to control the plan manually rather than let MRP or APS calculate demands and create supplies (MRP and APS plan only the component materials of MPS items). You will analyze expected demand, backlog, and estimated resources and enter MPS receipts as you think necessary. MRP and APS do not plan the MPS end item, but they use the MPS receipts you enter to calculate required production and purchasing of items in the MPS item's bill of material.

You can define an item as an MPS item at any level in a bill of material. Where you define MPS items should be influenced by where you want to control supply. If you define an end item as an MPS item, you are controlling supply for customer orders, and MRP or APS create the planned orders for the components to meet that supply. If you define a subassembly as an MPS item, you are controlling supply for that level of the bill of material and indirectly affecting the end-item supply.

Defining the MPS Plan Fence

The MPS Plan Fence allows you to define a time window outside which the MPS Processor automatically plans longer-term demands, and inside which you can manually control the shorter-term demands. The length (a number of calendar days) you choose for the window should depend on how far out you want to create MPS receipts manually. Or you might use the item's lead time as the plan fence. You can define the MPS Plan Fence at three levels:

1   For a specific item (Items form)

2   For all items in a product family (Family Codes form)

3   For all items in the system (Planning Parameters form)

When determining the MPS Plan Fence to use, the MPS Processor starts at the Items level, then checks the Family Code level, and finally checks the Planning Parameters. If the MPS Plan Fence is blank in all three places, the processor generates exception messages but does not create MPS receipts.

Use of the MPS Plan Fence is optional; if you are using the master production schedule to create all demands/receipts manually, you can leave the MPS Plan Fence blank.

Using the MPS Processor to Create a Master Production Schedule

The MPS Processor is a utility that automatically plans longer-term demands for MPS items based on demands and existing receipts in the system. It performs these steps:

1   Reviews all ordered or planned customer orders for all MPS items and consumes any forecasts for those items.

2   Reviews all other demands, such as jobs, forecasts, transfer orders, etc., for the MPS items and determines whether existing receipts can satisfy those demands. For each unsatisfied demand, the utility compares the demand's due date to the current date + the MPS Plan Fence. Depending on whether the due date is before or after the plan fence, the utility performs one of these steps:

    •   If the demand is due BEFORE the current date + MPS Plan Fence, the utility generates an exception message such as "Add MPS Order." You are responsible for creating an MPS receipt to satisfy the demand, using the **Master Production Schedule** form.

    •   If the demand is due AFTER the current date + MPS Plan Fence, the utility creates an MPS receipt automatically for the unsatisfied quantity.

The MPS Processor creates receipts only for the *demand* quantity that is unsatisfied after the plan fence. For example, if the item's projected on-hand is 50 below safety stock at the plan fence date and there is a demand for that item due after the plan fence for another 25, the MPS Processor generates an MPS receipt only for the demand for 25, NOT for the entire shortage of 75. You must create an MPS receipt for the shortage of 50 using the Master Production Schedule form.

Scheduling the MPS Processor to Work with MRP or APS

The MPS Processor does not pass demands down to the components in an MPS item's bill of material. For example, if item A is made from 1 item B and 1 item C, and the MPS Processor sees a demand for 10 of item A, it creates an MPS receipt only for item A. However, when you run MRP or APS Planning, the MRP or APS system (depending on your selected planning mode) creates a planned order for the component demand for 10 each of items B and C. The MRP and APS systems do NOT create planned orders for the demand for the MPS end items that were already planned by the MPS Processor. Because of this interaction between MRP, APS, and MPS, we recommend you schedule the MPS Processor to run before MRP Planning or APS Planning (you can schedule both utilities to run on the Background Queue). If you have not defined an MPS Plan Fence, the sequence in which you run the two utilities is not important.

NOTE: If you have MPS items that are end items and other MPS items that are used as components or subassemblies in bills of material, you should run the MPS Processor, then run APS Planning or MRP Planning, and finally run the MPS Processor again. This practice ensures that the MPS

Processor is working with up-to-date data. The MRP and APS systems perform the passing of demands to the bill of material; the MPS Processor does not know about the MPS demands in a bill of material until after you run MRP or APS Planning.

Also, the APS system views MPS receipts as demands around which it must plan other demands into available capacity. You can define the planning priority of an MPS receipt on the APS Order Priority form.

Adding Receipts to the Master Production Schedule

As prompted by the exception message "Add MPS Order," or as otherwise necessary, use the **Master Production Schedule** form to create MPS receipts manually to satisfy demands due inside the MPS Plan Fence.

NOTE: When you create an MPS receipt, you can use the **Planning Detail** form to see the discrepancies between your MPS supply and order-based demand, just as you can with planned orders generated by MRP or APS.

Releasing MPS Receipts to Production

As prompted by the exception message "Release Order (MPS Item)," or as otherwise necessary, use the **Master Production Schedule** form or the Material Planner Workbench to firm MPS receipts into jobs or production schedules. The Material Planner Workbench allows you to firm many receipts at the same time.

Including MPS Receipts in the Schedule

If you need to schedule the resources required for producing the quantities of your MPS receipts, you must include the MPS receipts in the processing performed by the Scheduling activity.

The Scheduling activity includes MPS receipts in the schedule only if you select the **Schedule MPS Orders** option on the Scheduling tab on the Shop Floor Control Parameters form.

MPS Steps

You may maintain your master production schedule using a process like this:

1 Schedule the MPS Processor to run nightly (as described above).

2 Each day, review any exception messages the MPS Processor generated.

3 Use the Master Production Schedule form to create MPS receipts to satisfy shorter-term demands.

4 Use the Master Production Schedule form or Material Planner Workbench to release MPS receipts to production by firming them into jobs or production schedules.

Creating MPS Receipts Manually

Use the Master Production Schedule form to add receipts to the master production schedule manually.

1   Make sure the correct item is displayed in the Item field.

2   Select **Actions > New**.

3   In the Due Date field, enter the due date for the receipt.

4   In the Original Qty field, enter the quantity for the receipt.

5   This step is for APS only. Click the Get ATP/CTP button to check the viability of the demand against the APS plan. This process enters a Projected Date automatically. If you accept the Projected Date, it is also copied into the Due Date field.

6   After entering the planned quantities, you can firm the receipt and convert it to either a job or production schedule (depending on the value in the Production Type field on the Items form - Planning tab). See Firming MPS Orders for more information.

Firming MPS Orders

This process describes how to convert MPS receipts into jobs or production schedules. The system converts the MPS receipt depending on the Production Type setting on the Items form.

Production Type	Converts To
Job	Job-Firm
Prod Sched	Routes to Generate Production Schedules form and creates production schedules
Kanban/Jit	Prevents you from firming order

NOTES:

• If a job is to be created, you enter the job number and the quantity of the release, and the system creates the job header automatically. However, you must copy or create the routing and bill of material.

• If a production schedule is to be created, the system takes you to the Generate Production Schedules form.

To use this feature, follow these steps:

1   Make sure the correct item is displayed on the Master Production Schedule form.

2   Select the MPS receipt you want to firm.

3   Select the **Firm** button.

- If the **Firm MPS Order dialog** appears, follow steps 4-5.
- If the **Generate Production Schedules** form appears, follow steps 6-7.

4   In the Firm MPS Order dialog, enter the appropriate data in the following fields:

- **Job Prefix** - Enter a job prefix or accept the default of the next new job number.
- **Original Quantity Released** - Enter the quantity to be produced for this job.
- **Due Date** - Enter the due date for this receipt.

The default values display from information on the MPS receipt you are firming, but you can overwrite the default values as necessary.

5   Select **OK** to firm the receipt.

6   On the Generate Production Schedules form, select the **Process** button to generate the production schedule.

7   If no operations exist for the item, the message, "Copy will be performed from Current Operation to Operation," displays. Click **OK**. A success message displays the number of production schedule releases the system generates.

NOTE: You can also use the Material Planner Workbench to firm MPS receipts.

Running the MPS Processor

The **Master Production Schedule (MPS) Processor** compares current jobs, production schedules, purchase orders, and MPS receipts against demands for an item, and then generates any exceptions and creates MPS receipts for demands due later than the current date + the MPS Plan Fence.

1   Open the **MPS Processor** form.

2   Enter the starting and ending planner code.

3   Enter the starting and ending inventory item.

4   Click **Process** to start the process.

After you run the MPS Processor, you can view the exception messages to identify any shortages. You can view exceptions from all inventory items by running the **Exceptions Report** or by viewing the **Planning Detail** form. Use the **Master Production Schedule** form to create MPS receipts to address unsatisfied demands due inside the MPS Plan Fence.

Using the Material Planner Workbench

Material Planner Workbench Overview

The Material Planner Workbench offers you an alternative method for generating supply orders that satisfy requirements without needing to run MRP or APS. The system considers the demands and supplies at all warehouses across the entire plan horizon and creates planned supply orders to cover all instances where the on-hand inventory is below safety stock. The system places the item replenishment data on the Material Planner Workbench, where you can review it, make changes, and firm it into purchase orders, purchase requisitions, jobs, production schedules, MPS orders, and transfer orders.

Material Planner Workbench Generation form

The Material Planner Workbench Generation form generates planning data that will be used to populate the Material Planner Workbench form. You can generate data from one of the following sources: MRP or APS plan output, item replenishment data (that is, a netting of all demands and supplies at the warehouses), or cross-referenced orders. The system uses the following three methods to generate the planned supply orders:

- **MRP, APS, or MPS** - The system copies the MRP, APS, and MPS data directly from the output tables that populate the Planning Detail form. This is similar to the Order Action Report form except that KANBAN/JIT are excluded and MPS items are included.
- **Item Replenishment** - The Inventory Below Safety Stock logic is used to select items that need to be replenished.
- **Cross-Referenced Orders** - The system scans a range of customer orders, projects, jobs, and production schedules that have a basic cross-reference type but do not yet have a cross-reference number assigned to them. The system ignores reference types of Stocked.

The following chart shows which fields on the Material Planner Workbench Generation form correspond to each source:

MRP, APS, or MPS	Item replenishment data	Cross-referenced orders
Use Planned Data	Warehouse	Order
	Item	Project
		Transfer

Job

NOTE: Configured items are not included in the generation.

Material Planner Workbench form

Once you have run the generation, open the Material Planner Workbench form to view the planned orders.

NOTE: Not all item information is stored in the data file generated by the Material Planner Generation form. When you open the Material Planner Workbench form, some item information is pulled from the Items form. If an item's Configuration Flag field was selected between the time when you generated your data and the time when you opened the Material Planner Workbench form, the orders associated with those items can no longer be firmed and will cause the process to stop. Delete these workbench records to continue firming orders.

When data populates the Material Planner Workbench form, it is divided into six views based on two sets of criteria.

If you're using MRP, APS, and MPS data or item replenishment data, the records are assigned to views according to the following rules:

- If the item's MPS Flag field is selected on the Items form, then the record is placed on the MPS Order view.
- For item replenishment data, if the current warehouse is not the default warehouse, the record is placed on the Transfer Order view.
- If the item's Source field is set to Purchased, the record is placed on the Purchase Order view, even if you do not have purchasing authorization.
- If the item's Source field is set to Manufactured and the Prod Type field is set to Job on the Items form, the record is placed on the Job view.
- If the item's Source field is set to Manufactured and the Prod Type field is set to Prod Sched on the Items form, the record is placed on the Production Schedules view.
- If the item's Source field is set to Transferred on the Items form, the record is placed on the Transfer Order view.

If you're using mass cross-referencing, the records are assigned to views according to the following rules:

- If the cross-referenced item's MPS Flag field is selected on the Items form, the record is placed on the MPS Order view.
- For order cross-references, the Reference field on the Customer Order Lines form determines which view the data will be placed on. If the setting is either Inventory or Project, this record is not included on the workbench.
- For project cross-references, the Ref field on the Project Resources form determines which view the data will be placed on. If the setting is Inventory, this record is not included on the workbench.

- For transfer cross-references, the Ref Type field on the Transfer Order Lines form determines which view the data will be placed on. If the setting is Inventory, this record is not included on the workbench.

- For job cross-references, the Reference Type field on the Job Materials form determines which view the data will be placed on. If the setting is Inventory, this record is not included on the workbench.

A Summary form allows you to see the domestic currency value of the data currently loaded on the Material Planner Workbench along with the value of only the items that are selected to be processed.

Generating Data for the Material Planner Workbench

Use the **Material Planner Workbench Generation** form to populate the **Material Planner Workbench** form with planned supply orders. To generate the data, perform the following tasks:

1   If you will be generating data based on a range of jobs or projects, make sure that every job or project in the range has been scheduled. Jobs and projects that have not been scheduled will not be included on the **Material Planner Workbench** form. Run the Scheduling activity before running the **Material Planner Workbench Generation** form.

2   Decide if you want to delete your previous batch before posting this data on the **Material Planner Workbench** form. If you select No under Delete Planner's Batch, new data will be added to the previous batch.

   NOTE: In some situations, if you do not delete the planner's batch, the Generation does not process any records.

3   Determine whether you want to use MRP, APS, or MPS planned data, item replenishment information, or cross-referencing to generate the planned supply orders.

Generation method	Description	Do this to use it
MRP or APS planned orders, MPS data, or approved requisition lines	Output from running MRP Planning, APS Planning, or MPS Processor	Select Yes under Use Planned Data. Make sure the MRP Planning, APS Planning, or MPS Processor have run successfully before you run the Material Planner Workbench Generation
Item replenishment information	Determines whether the total demand for an item, netted against the total supply for the item, drives the on-hand inventory level below the safety stock value. Creates a planned supply order to cover each shortage (due	Select No under Use Planned Data and enter a warehouse and a range of items.

	date=current date/time + lead time).	
Cross-referencing	Creates planned supply orders for all requirements and hard-pegs the supply orders to the requirements.	Select No under Use Planned Data and enter a range of orders, projects, transfers, and jobs. Leaving the range blank will process all records of that type. For jobs and projects to be included, they must be scheduled and must not have a cross-reference value.

4   You must select the Process field for each type of data before that data can be processed (at least one type must be selected, unless you are using Planned Data).

5   Enter an ending date, source, planner code, and buyer. If the source is **Purchased** or **Transferred** and Use Planned Data is set to **Yes**, source rules are consulted.

   NOTE: If the Generation does not create any records, make sure your Buyer code is associated with the items you are trying to process, or try blanking out the Buyer and/or the Planner Code to process all items. Also, make sure the Ending Date is set far enough into the future to find records to process.

6   To calculate replenishment requirements for all warehouses, specify your **Default** warehouse (as specified on the Inventory Parameters form) in the **Warehouse** field. To calculate replenishment requirements for only a single warehouse, specify that warehouse in the **Warehouse** field. If you enter a warehouse other than the default warehouse, the following fields are disabled:

- Use Planned Data
- Order
- Project
- Transfer
- Job
- SRO

7   If you want requirements to be replenished by transfer orders, select **Transfer**. For any other means of replenishment (such as by jobs or purchase orders), select **Direct**. Direct demand generates replenishments to the selected warehouse, and direct demand data can populate any **Material Planner Workbench** view except Purchase Requisitions.

8   After you have entered ranges of items to process (if Use Planned Data is set to No), click **Process**.

About Replenishment Orders

When you generate orders on the **Material Planner Workbench** form, the system uses the replenishment order information to determine how to replenish each item. Assign replenishment orders ahead of time by entering a purchase order number, production schedule id, or transfer order number on the **Item/Warehouse** form for the desired warehouse. When you run the **Material Planner Workbench Generation** utility, a release is planned on the order or schedule ID number you entered on this form. If no replenishment order number exists for the current warehouse, the system looks at the default warehouse for this item. If no replenishment order number exists for the default warehouse, the **Replen Ord** field is left blank for this order. Specify a number manually or leave the field blank and let the system create one when the order is firmed.

NOTE: Manually selecting a replenishment order on the **Material Planner Workbench** form affects only the records currently loaded on the workbench. To change all records in the system, modify the **Item/Warehouse** record for the warehouse that needs the replenishment.

Creating Source Rules for Planned Orders

You can set up rules that automatically split planned purchase orders for a purchased item or a product code between multiple vendors. The quantity requested from each vendor depends on the percentage specified for that vendor in the source rule. You can also define rules that split planned transfer orders for a certain item or product code between multiple sites/warehouses.

Setting Up a Source Rule

On the **Source Rules** form:

1   Specify a unique **Source Rule** ID and description.

2   Specify either an item or a product code to be sourced:

- If you specify an item, the source that is defined for the item defaults into the **Source** field and cannot be changed.

- If you specify a product code, you can select a **Source**: either **Purchased** or **Transferred**. For example, if you select **Purchased**, the rule applies only to items with this product code where the item's **Source** is set to **Purchased**.

3   Optionally, specify an **Effective Date** and/or an **Expiration Date** for which the rule will apply.

4   If the **Source** for the rule is **Purchased**, use the Purchased grid to specify the vendors to use and the percentage each vendor will provide.

5   If the **Source** for the rule is **Transferred**, use the Transferred grid to specify the site and warehouse, and the percentage each site/warehouse will provide.

How the Rules Are Used

In the **Material Planner Workbench Generation** form, the source rules are consulted when **Source** for the item is set to **Purchased** or **Transferred.** The rules are consulted no matter which of the three modes is used (Use Planned Data, Item Replenishment/Inventory Below Safety Stock, or Cross-Reference).

If a source rule exists for the item or the product code, and if the **Release Date Order** of the planned purchase order or transfer order falls into the effective date range and before any expiration date specified for the rule, then the planned order is split according to the percentages in the rule.

If no appropriate source rule exists for a planned purchase order, the system uses the vendor rankings from the **Vendor Contracts** form to determine the vendor, and creates one PO for the entire quantity (or it creates a replenishment purchase order if there is a standing replenishment order).

If no appropriate source rule exists for a planned transfer order, the system generates the standing replenishment transfer order, if it exists. Otherwise, it generates a transfer order with the default site/warehouse.

You can override an existing source rule by creating a purchase order manually, or by overwriting the vendor in the planned demand.

Cross-Referencing a Range of Line Items

As described in Cross-Referencing Supplies to Demands, the system allows you to hard-peg single demand orders to supply orders through the cross-reference function. For convenience, the **Material Planner Workbench** allows you to cross-reference a range of orders in a single process.

NOTE: This help topic uses customer order line items as an example demand type; however you can also perform this procedure with jobs, projects, or transfer orders.

1   Create customer order line items as you normally create them (on the **Customer Order Lines** form). In the **Reference** field, select the type of supply to which you will be cross-referencing the order line.

2   Open the Material Planner Workbench Generation form.

3   Select the following parameters:

   NOTE: If a parameter on the form is not listed here, use the default value.

   - Use Planned Data: Set to No.
   - Process check box (next to Order): Set to Yes.
   - Starting and Ending (next to Order): Enter the range of orders you want to cross-reference.

4   In the remaining fields, select any other options as desired to further filter the orders to cross-reference.

5   Click **Process**.

The system generates a message indicates how many customer orders were processed successfully. This process populates these orders for use in the **Material Planner Workbench** form.

6 Open the Material Planner Workbench form.

7 In the **View** field, select the type of transaction that was specified as the reference for the customer order line on the **Customer Order Lines** form.

For example, if the order line's **Reference** field contains **Job** on the **Customer Order Lines** form, select **Job** in the **View** field. After you select a transaction type, the customer order line records appear in the grid.

8 Select the **Process Line** field next to each order you want to cross-reference.

9 Select **Actions > Save**.

10 Click **Generate Orders**.

The Material Planner Workbench **Firm [*transaction*]** dialog box appears. For example, if the **Reference** field on the **Customer Order Line** form was set to **Job**, the **Firm Job** dialog box appears.

11 Select the appropriate options in the **Firm [*transaction*]** dialog box. For example, in the **Firm Job** dialog box, if you want to create subjobs, select **Copy Indented BOM**.

12 Click **OK**. A success message indicates how many transactions were processed.

Deleting or Updating the Cross-Reference

After a cross-reference is created, you can change it by either removing the line item or changing the cross-reference information, thus deleting the cross-reference. When this happens, the system displays a warning message indicating the cross-reference will be unlinked.

To view unlinked references, you can filter on the Unlinked Reference check box. You can then do one of the following:

• Clear the **Unlinked Reference** check box so that the record is no longer unlinked. There is no indication in the system that the record was ever cross-referenced.

• Delete the supply record.

• Leave the **Unlinked Reference** check box selected.

Firming Planned Orders Through the Material Planner Workbench

With the **Material Planner Workbench**, you can firm multiple items with multiple orders at one time.

1 Enter replenishment data on the Material Planner Workbench form, based on the parameters you defined on the Material Planner Workbench Generation form.

2 Review the information, and then mark orders to be generated.

3   Do one of the following:

- Select the check box in the **Process Line** field for each line to be generated.
- Use the Process Thru Date field.

4   Click **Generate Orders**. In the window that displays, set order options as follows:

Transaction	Window Opened
Purchase Order	Firm Purchase Order
Purchase Requisitions	Firm Purchase Requisition
Job	Firm Job Order
Production Schedules	Firm Production Schedule
MPS Order	Firm Master Production Schedule Order
Transfer Order	Firm Transfer Order

5   To begin order generation, click **OK**.

The system processes one record at a time. If an error occurs during the firming process, the system returns you to the **Material Planner Workbench** form. Any orders that were successfully firmed before the error occurred are removed from the workbench.

Working with Planned Orders

Controlling Planned Order Creation

This topic applies to APS.

Some planning situations may cause APS to create more planned orders than you need to satisfy the current set of demands. Infor CloudSuite includes several parameters to help you control the creation of excess planned orders while ensuring that your demands are not delayed unnecessarily. The table below summarizes these parameters.

Use this parameter...	For this planning problem	Notes
Supply Usage Tolerance	PO arrives just after the demand's due date, so the demand is unable to use the supply. The system generates a new planned purchase order.	Allows you to use a supply (such as a purchase order line item) to satisfy a demand that is due earlier than the supply is due. You can define the tolerance time window in terms of hours or days, depending on whether you enter a positive or negative number: * Positive number: the system searches for supplies starting from the demand's due date/time + the tolerance number of hours. * Negative number: the system searches for supplies starting from the demand's due date at 00:00 (midnight) + (24 hours * the positive tolerance value). See Using Supply Usage Tolerance for more information.
Planned Mfg Supply Switching	When a parent item of a bill of material is defined with an Order Maximum value, and its component items are defined with Order Minimum values, the system may create excess planned orders in certain situations.	Because this parameter is likely to significantly slow performance of the APS Planning activity, you should select this parameter only for those situations in which the parent item uses an Order Maximum and its component items use Order Minimums. Enabling this parameter allows the system to reallocate the excess planned supplies appropriately and not

generate excess planned orders. The global parameter appears on the Planning Parameters form and the item-specific parameter appears on the Items form. For the system to apply the switching, you must enable the parameter on the Planning Parameters form AND on each Items record you want to affect. Clearing the global parameter disables the option for all items.

Consolidating Planned Orders

The MRP and APS systems create one planned order for each requirement that is not satisfied by existing on-hand inventory or other receipts. You can consolidate these planned orders into more manageable increments by specifying parameters on the Planning Parameters form and on the Items form.

The consolidation options allow you to generalize the planning detail progressively as the planned orders are due later. For example, you may want to plan carefully all requirements due within the week, but group everything due after that into larger groups that are easier to track.

NOTE: MRP consolidates only according to the Days Supply value defined on the Items form, and always with a value of at least 1. Although you can enter 0 in the Days Supply field, MRP treats 0 as 1 day.

The system follows these steps to determine how to combine the planned orders for a given item. In MRP mode, the MRP Planning activity performs the steps. In APS mode, the system performs these steps in one of the following ways:

- If the **Days Supply Planning** field is selected, planned order consolidation occurs after the planning logic phase, then a second planning logic phase begins.
- If the Days Supply Planning field is not selected, planned order consolidation occurs after the planning logic is complete.

1   If you are using APS, the system considers the **Manufactured Items** and **Purchased/Transferred Items** consolidation parameters on the **Planning Parameters** form.

Consolidation Setting	Description
None (default)	The system does not consolidate the planned orders. There will be one planned order for each unsatisfied requirement for the item. MRP does not support this option; it always consolidates with a Days Supply of at least 1.
One Day	The system consolidates all planned orders due on the same day into a single planned order. There will be one planned order for each day's requirements

<table>
<tr><td></td><td>for the item.</td></tr>
</table>

Days Supply	The system consolidates all planned orders due within the item's Days Supply number of days into a single planned order. For example, suppose an item with Days Supply = 5 has four planned orders: PLN01 due October 10, Qty=500 PLN02 due October 13, Qty=100 PLN03 due October 17, Qty=500 PLN04 due October 22, Qty=50 The system consolidates PLN01 and PLN02 into one planned order for quantity of 600 due October 10. PLN03 and PLN04 are consolidated into a single planned order for quantity of 550 due October 17. The due date of the earliest requirement is used as the due date of the consolidated planned order.

2   The system checks the **30-day Bucket Fence** parameter on the **Planning Parameters** form. If the number of calendar days is reached, the system ignores the Planned Orders Consolidation parameter settings and combines the planned orders into 30-day increments.

> **EXAMPLE:** Suppose the current date is October 10, and the 30-day Bucket Fence is set to 50 days. In addition to earlier planned orders for a given item, there are several planned orders for it that are due much later:
>
> PLN10 due December 20, Qty=100
>
> PLN11 due December 23, Qty=50
>
> PLN12 due January 6, Qty=200
>
> PLN13 due January 10, Qty=100
>
> PLN14 due January 31, Qty=100
>
> All of these planned orders are due within the same 30-day period. The system combines these orders into a single planned order for 550, due December 20.

3   The system checks the **90-day Bucket Fence** parameter on the **Planning Parameters** form. If this number of days is reached, the system begins grouping all requirements due within the 90-day period into a single planned order.

Note: Typically, the **90-day Bucket Fence** is set to a larger number of days than the **30-day Bucket Fence**, to create a logical progression of detail in your planned orders.

Disabling Consolidation for Specific Items (APS only)

If you are using APS, you can disable consolidation for a specific item while using consolidation for the rest of your items. Enter **0** in the Days Supply field on the Items form for the item for which you want to disable consolidation. Planned orders for this item will not be consolidated (however,

consolidation happens as specified for all other items). If you are using MRP, the system always consolidates with Days Supply of at least 1.

Firming Planned Orders

You can convert planned orders to purchase orders, purchase requisitions, job orders, production schedules, or transfer orders. The system converts the planned order depending on the value in the Source field on the Items form - General tab and the Production Type field on the Items form - Planning tab.

For purchased items, the system also bases the conversion on the value in the Create PO Reqs from PLN field on the Planning Parameters form.

The table below lists the situations in which the system converts planned orders. For details about how to perform each conversion process, select one of the items in the Converts To column below.

Source	Production Type	Create PO Req enabled?	Converts To
Purchased	_	No	Purchase Order
Purchased	_	Yes	Purchase Requisition
Manufactured	Job	_	Job Order
Manufactured	Prod Sched	_	Production Schedule
Manufactured	KANBAN/JIT	_	Prevents you from firming order (Firm button is grayed-out and not available)
Transferred	_	_	Transfer Order

During the firming process, the system checks the Material Planner Workbench form for any duplicate records. If any exist, you are asked to delete the duplicate records from the Material Planner Workbench form. If you click **OK**, firming can continue. If you click **Cancel**, firming is stopped.

Firming Planned Orders into Job Orders

When the **Source** field on the **General** tab of the Items form is set to **Manufactured** and the **Production Type** on the **Planning** tab of the **Items** form is set to **Job**, the system firms each selected planned order into a new job.

1 From the Planning Detail form, select the planned order(s) you want to firm.

2 Click the **Firm** button. The system displays the Planning Detail Firm Job form.

3 In the **Job Prefix** field, perform one of the following actions:

- To use the default prefix defined in the Shop Floor Control Parametersform, leave the field blank.

- To use a prefix other than the default, enter a different job prefix.

4 If you want the system to create a single-level job, select **Copy Current BOM**.

5 If you want the system to generate orders for any associated sub-jobs as well as the top level jobs, select **Copy Indented BOM**.

6 Click **OK**.

The system firms the planned orders into new jobs, assigning the next available job numbers.

NOTE: The system creates the job header automatically, but you must either copy or create the routing and bill of material.

Firming a Planned Order into a Production Schedule

When the Source field on the General tab on the Items form shows that the source for this item is Manufactured and the Production Type on the Planning tab is Prod Sched, the system firms the selected planned order into a production schedule.

1 From the Planning Detail form, select the planned order you want to firm.

   NOTE: You can select only one planned order at a time to firm into a production schedule.

2 Click **Firm**. The system takes you to the Generate Production Schedules utility.

3 Click **Process** to generate the production schedule.

Firming Planned Orders into a Purchase Order

When the **Source** field on the **General** tab of the Items form shows that the source of this item is **Purchased** and the **Create PO Reqs from PLN** field in the Planning Parameters form is cleared, the system firms each selected planned order into lines or releases on a purchase order.

To firm multiple orders at once, use the **Material Planner Workbench**.

1 From the Planning Detail form, select the planned orders you want to firm.

2   Click the **Firm** button.

The system displays the Planning Detail Firm PO form.

3   In the **PO** field, perform one of the following actions:

- To let the system assign the next available PO number, leave the field blank. The system adds the default PO prefix defined in the Purchasing Parameters form.
- To use a prefix other than the default, enter a new PO prefix.
- Enter or select an existing PO number.

If you select a regular PO, the planned orders become lines on the PO. If you select a blanket PO, the planned orders become releases on the PO.

NOTE: If you enter an existing blanket PO, and this item does not appear on any line in the PO, the system sums the quantities of the selected planned orders and stores them in the newly created blanket PO line.

If you entered an existing PO number, the vendor for that purchase order displays automatically in the **Vendor** field.

NOTE: For existing purchase orders, the system always uses the vendor specified on the purchase order, rather than the default vendor from any existing item/vendor cross-reference.

4   If the **Use PO Change Orders** parameter on the **Purchasing Parameters** form is set to **Sometimes**, you can select the **Perform PO Change Order** field to create a PO change order.

If the parameter is set to **Always**, the system creates the PO change order automatically.

If the parameter is set to **Never**, the **Perform Change Order** field is disabled.

5   If you created a new purchase order, select a vendor. If you know the vendor number, enter it in the **Vendor** field.

NOTE: If you leave the **Vendor** field blank, the system assigns the item's first-ranked item/vendor cross-reference. If no item/vendor cross-reference exists, the system creates the PO with no vendor assigned.

6   On the **Planning Detail Firm PO** form, click **OK**. The system firms the planned orders into the purchase order.

Firming Planned Orders into a Purchase Requisition

When the **Source** field on the Items form, **General** tab shows that the source for this item is **Purchased** and the **Create PO Reqs from PLN** field in the Planning Parameters form is selected, the system firms each selected planned order into a line on a purchase requisition.

1   From the Planning Detail form, select the planned orders you want to firm.

2   Select the **Firm** button. The system displays the Planning Detail Firm Purchase Requisition form.

3   In the **Purch Req** field, perform one of the following actions:

- To let the system assign the next available requisition number, leave the field blank.

- To use a prefix other than the default, enter a new requisition prefix.
- Enter an existing requisition.

4   Select a vendor or vendor contract.

If you know the vendor number, enter it in the **Vendor** field.

NOTE: By default, the system assigns the item's first-ranked item/vendor cross-reference. If you leave the **Vendor** field blank, and if no item/vendor cross-reference exists, the system creates the requisition with no vendor assigned to this item.

5   Select **OK**. The system firms the planned orders into the requisition.

Firming Planned Orders into Transfer Orders

When the **Source** field on the **General** tab of the Items form shows that the source for this item is **Transferred**, the system firms each selected planned order into lines on a transfer order.

1   From the Planning Detail form, select the planned orders you want to firm.

2   Click the **Firm** button. The system displays the Planning Detail Firm Transfer Order form.

3   In the **Transfer** field, perform one of the following actions:

- To let the system assign the next available transfer number, leave the field blank. The system adds the default transfer prefix defined in the Transfer Order Parameters) form.
- To use a prefix other than the default, enter a new transfer prefix.
- Enter an existing transfer number. The planned orders become lines on the existing transfer.

NOTE: If you entered an existing transfer number, the system uses the existing transfer's **From Warehouse** and **To Warehouse** settings. In this case, skip to Step 6.

4   If you are creating a new transfer, in the **From Whse** field, enter the warehouse from which the item is being transferred.

5   In the **To Whse** field, enter the name of the warehouse to which the item is to be transferred.

NOTE: If you leave this field blank, the system uses the default warehouse as defined on the Inventory Parameters form.

6   Select **OK**. The system firms the planned orders into the transfer order.

Firming Planned Orders Through the Material Planner Workbench

With the **Material Planner Workbench**, you can firm multiple items with multiple orders at one time.

1   Enter replenishment data on the Material Planner Workbench form, based on the parameters you defined on the Material Planner Workbench Generation form.

2   Review the information, and then mark orders to be generated.

3   Do one of the following:

- Select the check box in the **Process Line** field for each line to be generated.
- Use the Process Thru Date field.

4   Click **Generate Orders**. In the window that displays, set order options as follows:

Transaction	Window Opened
Purchase Order	Firm Purchase Order
Purchase Requisitions	Firm Purchase Requisition
Job	Firm Job Order
Production Schedules	Firm Production Schedule
MPS Order	Firm Master Production Schedule Order
Transfer Order	Firm Transfer Order

5   To begin order generation, click **OK**.

The system processes one record at a time. If an error occurs during the firming process, the system returns you to the **Material Planner Workbench** form. Any orders that were successfully firmed before the error occurred are removed from the workbench.

Working with Intra-Site Transfers

About Intra-Site Transfers

In Infor CloudSuite, APS and MRP forecast planning can include a step to consider transit time between manufacturing and distribution warehouses within a given site. The process considers independent demand at warehouses that have dedicated inventory and that are set to plan intra-site transfers. Independent demand can be customer order lines and blanket lines, forecasts, project resources, or inter-site transfer orders.

Planned intra-site transfers are defined using these settings:

1   **From Warehouse** - The site default warehouse
2   **To Warehouse** - The distribution warehouse with independent demand
3   **Scheduled Ship Date** - The demand due date minus the intra-site transit time
4   **Scheduled Receive Date** - The demand due date

Planned supply orders are created based upon these items:

5   **Manufactured items** - The current BOM, production lead times, and demand due date
6   **Transferred items** - The supply source, lead time, and demand due date
7   **Purchased items** - The lead time, demand due date, and distribution warehouse

You can specify transit time, in days, for intra-site transfers on the **Warehouses** form, **General** tab. For more information, see Intra-Site Transfer Setup, Planning, and Review.

The **Intra-Site Transfer Master Display** form displays general intra-site transfer information for your review. From this form, you can drill down on a selected transaction for detailed information. And from the **Intra-Site Transfer Detail** form, you can firm a transaction to create transfer orders and transfer order line items. For steps, see Firming Planned Intra-Site Transfer Orders.

The Intra-Site Transfer Master Display Report displays information about each warehouse and item for your review, and the Intra-Site Transfer Order Action Report shows the planned orders (PLNs) you must firm for a given item to be available when needed.

Intra-Site Transfer Setup, Planning, and Review

To set up your system to include transit time from the default warehouse to a distribution warehouse during APS or MRP forecast planning, follow these steps:

General setup:

1   On the **Warehouses** form, define the distribution warehouse. Also, on the General tab, select **Dedicated Inventory** and **Plan Intra-Site Transfer**. In the **Transit Time** field, specify the number of days needed to move items from the default warehouse to this distribution warehouse.

2 On the **Item/Warehouse** form, define item warehouses for the distribution warehouse.

3 On the **Item Stockroom Locations** form, define item locations for the distribution warehouse.

4 On the **Planning Parameters** form, select the **Plan Intra-Site Transfers** field to cause the planner to consider transit times. Deselect this field to disregard transit times, meaning the distribution warehouses are treated as if their inventory and supply were at the default warehouse.

Define independent demand for the distribution warehouse:

1 On the Customer Order Blanket Lines form, enter a new order line for the distribution warehouse and item.

2 On the Warehouses form, enter new project material for the distribution warehouse and item.

3 On the Transfer Orders form, enter the current site as the **From Site** and the default warehouse as the **From Whse**. Specify the current site also as the **To Site** and the distribution warehouse as the **To Whse**. Use the current item.

Plan the transfer orders and review results:

1 Run **APS Planning** or MRP Planning.

2 Planned intra-site transfer orders are created for the distribution warehouses based on the **Priority** field on the **Item/Warehouse** form, or if priority is undefined, shortest to longest transit times.

3 On the **Master Planning Display** form, you can review the Transfer Demand column for planned intra-site transfer orders.

4 On the **Planning Detail** form, you can review detail for transfer demand and planned supply. Transfer demand is display-only and shows:

- **Reference value** - TPLN WTD-<number>.
- **Outstanding requirement** - Quantity from the planned intra-site transfer order, which is derived from the original independent demand at the distribution warehouse.
- **Release Date** - The date on which the item must be requested in order to arrive by the needed date.
- **End Date** - Scheduled shipping date from the planned intra-site transfer order, which is derived from the demand due date minus the intra-site transit time.

Planned supply for transfer demand is display-only and shows:

- **Reference value** - PLN <number>.
- **Parent reference** - TPLN WTD-<number>.
- **Outstanding receipt** - Quantity from the planned intra-site transfer order.
- **Release Date** - The plan job release date, which is based upon the release date from the planned intra-site transfer order, adjusted for manufacturing lead time.
- **End Date** - The release date from the planned intra-site transfer order.

NOTE: To firm a planned intra-site transfer order, you must use the Intra-Site Transfer Detail Firm Transfer Order form. For more information, see Firming Planned Intra-Site Transfer Orders.

Firming Planned Intra-Site Transfer Orders

To firm planned intra-site transfer orders:

1 On the **Intra-Site Transfer Detail** form, select the planned intra-site transfer orders to firm. These orders have a reference ID that begins with TPLN WTD.

2 Click **Firm**. The **Intra-Site Transfer Detail Firm Transfer Order** form is displayed with values set for the From and To sites, and From and To warehouses as defined on the planned intra-site transfer orders.

3 In the **Transfer** field, do one of the following:

- To let the system assign the next available transfer number, leave the field blank.

- To use a prefix other than the default, specify a new transfer prefix.

- Select an existing transfer number. Only transfer orders for which the From and To Warehouses match the corresponding warehouse values for the planned intra-site transfer orders are displayed. The planned orders become lines on the existing transfer.

4 Click **OK**. The system firms the planned intra-site transfer orders into the new or existing transfer order, and the planned intra-site transfer orders are replaced with a reference to the new or existing transfer order line.

Working with Transfer Orders

Transfer Orders Overview

The combination of transfer orders and transfer order lines is used to control more formal movements of larger volumes of materials and items.

A transfer order is typically used for moving items or materials between distribution centers, or for component and sub-assembly movement between plants that require a more formal multi-stage transaction. It does not require approval process or a requisition function.

Transfer orders are characterized by:

8 a transfer header and line items.

9 picking process.

10 separate entry of shipping and receiving transactions with provisions for recording loss, damage, rejects.

Transfer orders support the following:

11 visibility of in-transit inventory across the system including Transfer Order number, item, quantity in-transit, quantity to be shipped, date, shipment mode, freight cost, and value of shipment.

12 financial transactions

13 landed cost. All Landed Cost receipts must be vouchered before a transfer order can be closed.

14 Cross-reference functionality.

15 Picking List functionality.

16 Packing Slip functionality.

17 Bill of Lading functionality.

18 Pro Forma Invoice functionality.

19 various costing and pricing methods.

20 automatic updating of inventory fields for Planned Transfer Orders.

21 the ability to enter a transfer order without knowing the location or lot number. The location is not required until time of receipt. Likewise, if the receiving site enters the transfer order, it is not required to enter the from location of the items or materials being transferred.

22 maintenance of the Transfer order header data from the shipping site when it creates the transfer order.

23 partial shipping and receiving.

24 ability to track quantity differences, such as: loss, shrink, damage, rejects, and advance shipment. These will be tracked by Reason Codes.

25 Data Collection for shipping and receiving transactions.

Transfer Orders DO NOT support:

26 Change Order functionality.

27 Configured Items.

28 Discounts.

29 Blanket Orders functionality.

30 Progressive Billing.

31 EDI functionality.

You can set up the system to replicate planned transfer order demand orders to your remote supply sites (for MRP or APS Planning). See Setting Up Planned Transfer Order Replication for more information.

Transfer Orders Steps

Transfer orders track the transfer of inventory between warehouses.

Summary

Follow these steps to transfer inventory between warehouses.

1 Creating a Transfer Header

2 Creating Transfer Lines

   NOTE: Alternatively, you can quickly create an entire transfer order on the Transfer Orders Quick Entry form.

3 Shipping a Transfer Order

4 Receiving a Transfer Order

About Currency Conversions for Transfer Orders

The exchange rate for transfer orders is set on the **Inter-Site Parameters** form. For transfer orders, the system considers the To Site as the domestic currency site, and thus the exchange rate defaults to the To Site's current buy rate. If no buy rate has been established for the To Site, then the exchange rate defaults to 1.00.

If the From Site is the originating site in a transfer, then the From Site's currency is divided by the exchange rate to determine how the transfer cost will be converted into the To Site's currency.

EXAMPLE: Assume that the exchange rate, as entered on the **Inter-Site Parameters** form, is .80. If the From Site's currency is assumed to be 1.00, then the currency conversion for the To Site is as follows: 1.00/.80, or 1.25

If the To Site is the originating site in a transfer, then the To Site's currency is multiplied by the exchange rate to determine how the transfer cost will be converted into the From Site's currency.

EXAMPLE: Assume that the exchange rate, as entered on the **Inter-Site Parameters** form, is .80. If the To Site's currency is assumed to be 1.00, then the currency conversion for the From Site is as follows: 1.00 * .80, or .80

About Push/Pull Transactions

In setting up these account numbers it is important to understand the concept that moves or transfers can be either Push or Pull transactions.

Push transactions move or transfer material from Site A to Site B.

EXAMPLE: Site A moves material to Site B. Site A is considered the From Site and Site B is considered the To Site. The quantity will be moved from Site A to Site B. The quantity comes from the From Site. The transaction uses the cost/price of Site A.

Pull transactions move or transfer material from Site B to Site A.

EXAMPLE: Site A moves material from Site B. Site A is considered the To Site and Site B is considered the From Site. The quantity will be moved from Site B to Site A. The quantity comes from Site B to Site A. The transaction uses the cost/price of Site B.

Based on how you set up relationships among the sites in your system in the **Inter-Site Parameters** form, it is possible to initiate both moves and transfers from one site to another. The account numbers that default will be relative to the site that initiated the transaction, and are dependent on whether the transaction was a Push or Pull transaction.

Process

In the case where moves or transfers occur in both directions, two records need to be created:

32 From Site A To Site B
33 From Site B To Site A

In the case where moves or transfers only occur in one direction, you only need to enter one record. For example, if Site A moves items to Site C, but Site C never moves items to Site A, then you would only need to create a record From Site A To Site C.

In the case where moves or transfers never occur between two sites, for example, Site A and Site D, this record would not need to be created.

About Transfer Order Costing

The system supports the movement of material through the use of transfer orders. You can make transfers between warehouses within a site, between sites in the same financial entity, or between sites in different entities.

You use transfer order header and line items to capture the information to drive the movement and costing of material. Once materials are transferred, it is important to create the supporting Accounting and Material transactions.

Required System Parameters for Account Setup

You must establish the following accounts at the time of system setup. If you do not want to collect data at such a detailed level, the same account number(s) could be established as the default.

Parameter Name	Account Name
IntraDivision Clearing	Balance Sheet Account
InterDivision Payables	Balance Sheet Account
InterDivision Receivables	Balance Sheet Account
InterDivision Sales	Income Statement Account
InterDivision Cost of Sales - Matl	Income Statement Account
InterDivision Cost of Sales - Labor	Income Statement Account
InterDivision Cost of Sales - Fixed Ovhd	Income Statement Account
InterDivision Cost of Sales - Var Ovhd	Income Statement Account
InterDivision Cost of Sales - Outside Serv	Income Statement Account
InterDivision Profit on Sales	Income Statement Account
InterDivision Cost- Cost of Goods Sold	Income Statement or Balance on Sales Sheet Account
InterDivision In-Transit Inventory	Balance Sheet Account

InterDivision In-Transit Matl	Balance Sheet Account
InterDivision In-Transit Labor	Balance Sheet Account
InterDivision In-Transit Fixed Ovhd	Balance Sheet Account
InterDivision In-Transit Variable Ovhd	Balance Sheet Account
InterDivision In-Transit Outside Serv	Balance Sheet Account
InterDivision Valuation Variance	Income Statement Account

Landed Cost Accounts

Entries for landed costs use the following accounts:

Purchasing Parameters

34 Freight Payable
35 Duties Payable
36 Brokerage Payable
37 Insurance Payable
38 Local Freight Payable

Landed Cost Parameters

39 Freight In Expense
40 Duties Expense
41 Brokerage Expense

Simple/Robust Transfer Orders and Costing

The type of transfer order used determines whether inventory moves through In-transit accounts or directly to the buyer's inventory accounts.

Simple transfer orders do not use the To and From In-Transit Accounts or journal entries. However, robust transfer orders cause In-Transit entries to occur. The act of shipping and receiving inventory moves inventory into and out of In-Transit accounts.

EXAMPLE: To view specific examples of the transfer order costing methods in the system, click on the name of an example below:
Warehouse to Warehouse, Same Cost
Warehouse to Warehouse, Different Cost

Creating a Transfer Order Header

1 Open the **Transfer Orders** form.

2 Select **Actions > New**.

3 Enter the appropriate data in the required fields.

- **Transfer** - Enter a unique identifier composed of numbers, characters, or a combination. You can set the global prefix, **Transfer Prefix**, in the **Transfer Order Parameters** form. This prefix starts all generated transfer numbers with the same prefix followed by a system-generated number.

- **Status -** Enter a status or accept the default, which is **Ordered**. The options are:
    - o Ordered
    - o Transit
    - o Complete

- **From Site** - Enter the site from which to transfer the inventory.

- **To Site** - Enter the site to receive the inventory.

- **From Whse** - Enter the warehouse from which to transfer the inventory.

- **To Whse** - Enter the warehouse to receive the inventory.

- **# Packages** - Enter the number of packages associated with this transfer. This field can be used to record the number shipped and then to validate the number received.

- **Tot Weight** - Enter the weight of this transfer. This information is helpful to verify against the bill that will be supplied by the shipping vendor.

- **Ship Via -** Enter the code which tells the shipper how you would like this transfer order shipped.

- EU VAT fields - If necessary, enter EU VAT information (**NOTC**, **Delivery Terms**, and so on).

4 Select Actions > Save.

5 If there are associated landed costs, to set them up on the Transfer Order Landed Costs form, click the Landed Costs button.

6 To add line items, you can click the Lines button to open the Transfer Order Lines form. For more information, see Creating Transfer Order Lines.

Creating Transfer Order Line Items

1 On the Transfer Order Line Items form, select the Transfer Order to which you want to add line items. (If you just selected or created the Transfer Order header on the Transfer Order form, skip this step.)

2 Select **Actions > New**.

3 Specify information in these fields:

- **Line** - Enter a unique line number or accept the default, which will be incremented by 1 from the last line item entered for this transfer.

- **Item** - Enter a valid inventory item.

    NOTE: The inventory item entered must have a valid warehouse set up at the inventory item level for both the From and To Warehouse fields located on the Transfer Order header.

- **Quantity** - Enter the item quantity to be transferred. (This field is optional.)

- **Sched Rcpt Date** - Enter the date that the inventory is scheduled to be received.

- **Sched Ship Date** - This field is calculated by the system and is based on the Dock-to-Stock time entered on the Planning tab on the Items form.

- **Transit Loc** - Enter the location where the inventory will be stored while in transit, or accept the default of Transit.

    NOTE: A new stockroom location can be entered into the Transit Loc field. You will be prompted upon entering the Transit Loc to create the location.

- **From Ref Type** - Enter the source of the order being shipped. The default is Inventory. (If this is a multi-site transfer order, you can update this field only at the From site.)

- **To Ref Type** - Displays the destination for the order being received. The default is Inventory. (If this is a multi-site transfer order, you can update this field only at the To site.)

4   If your planning mode is APS, click the Get ATP/CTP button to incrementally plan the transfer order line item.

5   Select **Actions > New** to add a new line item, if necessary.

6   Select **Actions > Save.**

Receiving a Transfer Order

There are three ways to receive a transfer order.

Manually Receive

1   Open the Transfer Order Receive form.

2   Select a transfer order.

3   In Filter-in-Place mode, use the remaining header fields to filter the transfer order line items that will display in the grid.

4   After you exit Filter-in-Place, select, in the grid, all line items that you want to receive.

5   Edit the quantity received as needed.

6   Ensure that the From Location, Freight, Duty, Brokerage, and Local Freight fields are correct.

7   To add additional lines, click **Add Lines** to open the Add Transfer Ship Line modal form.

8   Enter the specifications for the new line, then click **Add** to return to the Transfer Order Receive form.

9   Click Receive to receive the selected transfer order line items.

Use the Transfer Order Receiving List

1   Open the Transfer Order Receiving List Report form.

2   Enter the appropriate data in the required fields:

- **Receive for Transfer** - Enter the number of the transfer to be processed.
- **Post as of Date** - Enter a date or accept the default current system date.

3   Select the **Post Material Receipt** field. When this field is selected, the system picks the inventory and post the journal transactions. However, serial and lot-tracked items are not posted.

4   Select the **Print** button to execute.

Use the Transfer Combined Ship/Receive

This procedure creates the journal entries for both the shipped and received inventory. See the Combined Transfer Order Ship/Receive form for more information.

NOTE: To record inventory that is either lost or damaged in transit, use the **Transfer Order Loss** utility.

Setting Up Planned Transfer Order Replication

This topic applies to MRP and APS.

Overview

The MRP and APS systems generate planned transfer supply orders (PLNs) for any components provided by remote supply sites. The due date on these PLNs will be based on each item's lead time and transit time. To generate the corresponding planned transfer demand, or TPLN, at the supply site (that is, for the supply site to "see" this demand), you must set up the system to replicate the planned transfer order to the supply site.

This topic describes how to set up the transfer order replication.

About the Replication Category

The "Planning" category is already set up for you on the Replication Categories form. You do not need to change the settings.

Defining Replication Rules for Transfer Orders

You must define the receiving site, supply site, and update frequency parameters for replicating the transfer orders. Follow these steps:

1 Navigate to the Replication Rules form.

2 Select **Actions > Filter>Cancel in Place**.

3 Select **Actions > New**.

4 In the Source Site field, select the ID of the receiving site (the site where the demand originates).

5 In the To Site field, select the ID of the supply site that produces the component. This should be the same site defined as the Supply Site on the item record. The planned transfer order will be replicated at this site.

6 In the Category field, select **Planning**.

7 In the Interval Type field, select the interval at which you want the transfer orders to be replicated to the target site.

8 See the help topics for the remaining fields on this form for additional options.

9 Select **Actions > Save** to save the record.

10 Repeat these steps to create replication rule records for every Source-Target site combination in which you want transfer orders to be replicated.

NOTES:

42 Multiple planned transfer demands are consolidated before being replicated to the supply site.

43 At the supply site, the planned transfer demand is incrementally planned as soon as it arrives (automatically). However, the resulting projected date for the order is not replicated back to the receiving site that generated the demand. At the receiving site, when you firm the planned transfer supply order into an actual transfer order, the system replicates that transfer order to the supply site and deletes the planned transfer demand (TPLN). Replication always keeps supply and demand transfer orders synchronized (but it does not do this for *planned* transfer orders).

44 The due date on a planned transfer order reflects transit time.

Compatibility of MRP and APS Sites

Sites running MRP Planning can replicate transfer orders to sites running APS Planning. Sites running APS Planning (in single-site mode) can replicate transfer orders to sites running MRP Planning. However, sites running APS Planning in Global mode cannot replicate transfer orders to MRP sites.

Shipping a Transfer Order

There are three ways to ship a transfer order.

Manually Ship

1   Open the Transfer Order Ship form.

2   Select a transfer order to ship.

3   In Filter-in-Place mode, use the remaining header fields to filter the transfer order line items that will display in the grid.

4   After you exit Filter-in-Place mode, select, in the grid, all line items that you want to ship.

5   Edit the quantity shipped as needed.

6   Ensure that the From Location field is correct.

7   To add additional lines, click **Add Lines** to open the Add Transfer Ship Line modal form.

8   Enter the specifications for the new line, then click **Add** to return to the Transfer Order Ship form.

9   Click Ship to ship the selected transfer order line items.

Use the Transfer Order Ship Pick List

1   Open the Transfer Order Ship Pick List form.

2   Enter the appropriate data in these fields:

- **Starting and Ending Transfer Numbers** - Enter the starting and ending transfer numbers of records to be processed.
- **Post Material Issues** - Select this field to to pick the inventory and post the journal transactions. However, serial and lot-tracked items are not posted.
- **Post as of Date** - Enter the date or accept the default of the current system date.
- **Reprint Pick List Items** - Select All Text to reprint all items that have a previous pick list date. Select None to not reprint all items that have a previous pick list date.

3   Click **Print** to execute.

Use the Combined Transfer Order Ship/Receive

This procedure will create the journal entries for both the shipped and received inventory.

1   Open the Combined Transfer Order Ship/Receive form.

2   Select a transfer order.

3   In Filter-in-Place mode, use the remaining header fields to filter the transfer order line items that will display in the grid.

4   After you exit Filter-in-Place mode, select, in the grid, all line items that you want to ship or receive.

5   Edit the quantity shipped or received as needed.

6   Ensure that the From Location and To Location fields are correct.

7   To add additional lines, click **Add Lines** to open the Add Transfer Ship Line modal form.

8   Enter the specifications for the new line, then click **Add** to return to the Combined Transfer Order Ship/Receive form.

9   Click Ship/Receive to ship or receive the selected transfer order line items.

Calculating Unit Price for Inter-Entity Transfer Orders

For transfer order lines where the Inter-Site Parameters record's Posting Method for transfers between the two sites is set to **Inter-Entity**, the system calculates the unit price as follows:

1   A price code for the transfer order may be specified in the From site's **Inter-Site Parameters** form, and/or in the From site's **Item Pricing** form for the item being transferred. If a price code is found in only *one* of these two areas (or if no price code is found), the system skips to step 3.

2   If the system determines that *two* valid price codes exist, then:

   a   The system looks for a **Price Matrix** record for this combination of codes.

   b   If the system finds a Price Matrix record, it finds the corresponding price formula and then checks the quantity price breaks, as defined on the **Price Formula** form:

      o   If the transfer line quantity exceeds one or more of the break quantities listed at the bottom of the form, the system uses the best valid quantity break to determine the unit price.

      o   If the transfer line quantity does not exceed any break quantity or if all break quantities are zero, the formula in the upper right corner of the Price Formula form is used to determine the unit price.

3   If fewer than two price codes exist (one or none), and the system finds a current **Item Pricing** record for the item (based on the item pricing's effectivity date), then:

   •   If any quantity price breaks have been established for the item on the Item Pricing form, and if the quantity price breaks apply, the system uses these quantity price breaks to determine the default unit price.

   •   If no other pricing has been established, the default unit price is the value entered in the Unit Price 1 field on the Item Pricing record.

4   If no price code exists, and no current Item Pricing record exists, the Unit Price is set to the Unit Cost.

Multi-Currency Calculations

Multi-currency calculations first try to locate price formulas and item pricing records in the To site's currency. If the To site's currency is available, those values are used. If no records are found in the To site's currency, records are located in the domestic currency and then converted to the To site's currency using the Exchange Rate on the Transfer Order.

For example:

Site A, Currency=USD

Site B, Currency=GBP

The transfer order has From Site=A and To Site=B and Exchange Rate=2.4. Site A has two Item Pricing records for the item being transferred, one with Currency=USD for 100 and the second with Currency=GBP for 111.

When you enter the transfer order line, the system would set the price to 111. If the GBP record did not exist, then the price would be 41.67 (= 100 / 2.4).

Transfer order prices are always displayed in the domestic currency of the current site.

Creating Transfer Order Lines Change Logs

In the past, when information related to a transfer order line was changed, a record of those changes was not maintained. The **Transfer Order Lines Change Log** provides a list of information related to a transfer order line.

Process Flow

A transfer order line change log is created in these situations:

45 When you create a new transfer order line on the **Transfer Order Line Items** form.

46 When you update this corresponding information on the **Transfer Order Line Items** form:

- UM
- Ordered Qty
- Scheduled Ship Date
- Scheduled Rcvd Date
- Transit Location

47 When you delete a transfer order line.

48 When you create, update, or delete a transfer order line using the **Transfer Orders Quick Entry** utility.

NOTE: A change log is not created when you update a transfer order status or line status.

Using the Delete Transfer Order Line Item Log Entries Utility

Use the **Delete Transfer Order Line Item Log Entries** utility to delete transfer order line item log entries. Follow these steps to run the utility:

1   Specify these fields:

   Starting/Ending Activity Date

   Select an activity date rage for the entries you want to include in the utility.

   Increment Date

   Select this check box to automatically increment the date range and re-run the utility.

   Starting/Ending Order

   Select the range of transfer order numbers you want to include in the utility.

   Starting/Ending Line

   Select the range of transfer order line numbers you want to include in the utility. The corresponding order line logs are deleted.

2   Optionally, select **Create initial item log entry for each item after delete** to create an item log entry for each affected order line.

3   Click **Process**.

Using Multi-Site Transfer Orders

Multi-Site Transfer Orders Information

The combination of transfer orders and transfer order line items is used to control more formal movements of larger volumes of materials and items. This combination is characterized by:

49   Transfer header and line items.

50   Picking Process.

51   Separate entry of shipping and receiving transactions with provisions for losses, damages, and rejects.

52   Visibility of in transit items.

53   Support for financial transactions.

Transfer Orders

A transfer order is used for the planning and controlling of stock movement and availability. When a transfer order requests that the material be transferred **FROM** the shipping site to the receiving site, the shipping site must be aware of this transfer order. If the material is being transferred **TO** the receiving site from the shipping site, the receiving site must be aware of this transfer order. After the

transfer order is entered at one site, the system creates a complementary record automatically at the other site.

Multi-Currency Issues when Adding or Updating Transfer Orders

When you create the transfer order, the exchange rate defaults from the Inter-Site Parameters form, and cannot be changed. When adding or updating header information between two sites, the system determines whether the currency is different for each site. If so, the system stores currency in the domestic amount of the site.

Multi-Site Transfer Order Assumptions

54 The Unit of Measure for items or materials that will be transferred must be IDENTICAL at all sites.

55 Transfer orders provide functionality to enter standard Transit Time between sites that is used as a default value.

56 Transfer orders allow a transfer order line item to be entered at one site that is to be **shipped** from that site.

57 Transfer orders allow a transfer order line item to be entered at one site that is to be **received** at that site.

58 Transfer orders allow maintenance of the transfer order header data from the shipping site when it creates the transfer order. The receiving site can also do maintenance when it creates the transfer order

59 Transfer orders allow partial shipping and receiving.

60 Each site that performs **shipping** transactions has a journal file.

61 Each site that performs **receiving** transactions has a journal file.

Planning Multi-Site Transfer Orders in MRP or APS

When an item is produced at a remote supply site, the creation of a supply transfer order must trigger a demand transfer order at the supply site in order for the supply site to know about that order. With MRP or APS, you can set up replication to create a demand transfer order at the item's supply site. See Setting Up Planned Transfer Order Replication for more information.

With the APS Planning mode, you can also run APS Planning in global mode, which runs the planning program at each remote site in your supply chain. See About Global Planning for information about how global APS planning plans transfer orders. MRP does not support global planning.

About Multi-Site Transfer Order Costing

Transfer of material is supported through the use of transfer orders. Transfers can be made between warehouses within a site, between sites in the same financial entity, or between sites in different entities.

Transfer order header and line items are used to capture the information to drive the movement and costing of material. Once materials are transferred, transfer orders will create the necessary supporting accounting and material transactions.

Overview

Transfer Order costing will function in one of two ways depending on the setting of the Posting Method parameter, found on the **Inter-Site Parameters** form. The available Posting Method choices are:

62 **Intra-Entity** - transfers occur at cost.

63 **Inter-Entity** - transfers occur with revenue, with the From Site making a profit.

Transfer Order processing first checks this Posting Method parameter to determine which types of financial entries to create. The actual scope of transactions created will also be affected by business processes at each site (for example, item cost at each site or pricing decisions).

> **CAUTION:** No validation is provided to ensure that the system's financial environment does in fact exist as defined by this parameter. You are responsible for creating a financial environment that identifies how individual sites report financial results. The intent of the Posting Method parameter is to guide Transfer Order functionality in creating financial transactions that support a type of financial environment.

Costing and the Free On Board (FOB) Site

The designation of the Free On Board (FOB) point controls much of the supporting costing functionality. In the Transfer Order system, you can identify the FOB point as either the Ship Site or the Receive Site. You must specify the FOB point for all intercompany movements.

If the FOB point is the Ship Site, transfer of ownership takes place at the time of shipment. Material moves from a location in the Ship Site to a transit location in the Receive Site, and financial ownership changes from the Ship Site to the Receive Site. At receipt time, transactions are created to move the material from the transit location to a standard location at the Receive Site.

If the FOB point is the Receive Site, transfer of ownership takes place at the time of material receipt. Material moves from a location in the Ship Site to a transit location in the Ship Site. At receipt time, transactions are created to move the material from the transit location at the Ship Site to a standard location at the Receive Site. Financial ownership changes at receipt time.

When a site **transfers** inventory to another site, inventory cost at the shipping site is relieved against the five cost categories (Material, Labor, Fixed Overhead, Variable Overhead, and Outside Services).

When a site **sells** inventory to a site in another entity of the company, the Inter-Entity cost of goods sold at the shipping entity is debited against the five cost categories, and inventory is relieved against all five categories.

When a site **receives** inventory transferred from another site, inventory is received into stock as if it were a purchased item. If the receiving site has employed standard cost, the transferred item comes into inventory using the five cost elements (Material, Labor, Fixed Overhead, Variable Overhead, or Outside Services). If the receiving site uses any other cost type, the cost comes in as Material Only.

Supported Financial Transactions

Multi-site transfer order costing supports the following inter-site financial transactions:

Inter-Entity

64 **Inter-Entity Accounts Receivable** - Equal to item price times the item quantity being transferred. Inter-entity accounts receivable is used for all Inter-Entity transfers, and only for Inter-Entity transfers, and is created only on the From Site.

65 **Inter-Entity Sales** - Equal to the cost of goods being transferred. Inter-Entity Sales is used for all Inter-Entity transfers, and only for Inter-Entity transfers, and is created only on the From Site.

66 **Inter-Entity Cost Of Sales** - Equal to the cost of goods being transferred. Inter-Entity Cost of Sales is used for all Inter-Entity transfers, and only for Inter-Entity transfers, and is created only on the From Site.

67 **Inter-Entity Profit** - Inter-Entity Profit is used for Inter-Entity transfers where the item price <> the item cost of the item being transferred. This is used only for Inter-Entity transfers, and is created only on the From Site.

68 **Inventory; Split-WIP** - Equal to the cost of the item, depending on the cost method used. Inventory, Split-WIP is used for all transfers and on both the From and To Sites.

69 **Inter-Entity Cost** - used where the item price <> the item cost of the item being transferred. This is used only for Inter-Entity transfers, and is used only on the To Site. The Inter-Entity Cost on the To Site must equal the Inter-Entity Profit on the From Site.

70 **Inter-Entity Accounts Payable** - Equal to the item price times the item-quantity being transferred. Inter-Entity Accounts Payable is used for all Inter-Entity transfers, and only for Inter-Entity transfers. This is used only on the To Site, and the Inter-Entity Accounts Payable amount must be equal to the Inter-Entity Accounts Receivable amount on the From Site.

71 **Inter-Entity Valuation Variance** - Inter-Entity Valuation Variance is used to capture cost differences between sites in different entities. Inter-Entity Valuation Variance is used only on the To Site.

NOTE: For Inter-Entity transfers, regardless of the cost method being used on the To Site, if the To Site cost is not equal to the From Site cost, then the difference is charged to inter-entity valuation variance.

Inventory Adjustment

72 **Inventory Adjustment** - Used when the To Site cost method is Specific Costing and the From Site item cost is not equal to the To Site item cost. This can be used for any transfer, and is used only on the To Site. Revaluation takes place, with the amount going to Inventory Adjustment.

Intra-Entity

73 **Intra-Entity Clearing** - Equal to the item-cost of material being transferred. This is similar in concept to the Cost Of Sales account used between Entities. Intra-Entity Clearing can be used for any Intra-Entity transfers, and only for Intra-Entity transfers. It is used on both the From Site and the To Site.

Transfer Markups

The system supports two types of transfer markups:

74 **Profit Markup** - A site within an entity sells product to another site in a different entity at a profit. Profit is defined as any amount added by the selling entity in excess of the cost amount of the inventory shipped. This markup must be eliminated during financial consolidation. From a company-wide standpoint, entities cannot make profits by selling to each other. From Site profit must equal the To Site cost. (A markup may be established by filling in the Price Code on the Inter-Site Parameters form. This uses standard pricing logic.)

75 **Cost Markup** - One entity or site transfers or sells a product to another entity or site and landed costs are incurred as a result of moving inventory. The seller does not increase costs to cover these expenses. It is the responsibility of the receiving entity to correctly include these costs in inventory. The Landed Cost functionality is used to include costs in the buying site's inventory. These costs are true costs to the receiving site, and should not be eliminated during financial consolidation.

Transfer Orders/Multi-Site Quantity Move and Costing

The method used to move inventory determines whether inventory moves through In-transit accounts or directly to the buyer's inventory accounts.

If you use the **Multi-Site Quantity Move** form, this method does not use the To and From Intransit Accounts of journal entries. However, if you use transfer orders, these can cause intransit entries to occur. The act of shipping and receiving inventory moves inventory into and out of Intransit accounts.

Examples

See the online help for specific examples of the multi-site transfer order costing methods in the system.

NOTE: The transfer process does not create journal entries if amounts or accounts are equal. Also, if items use standard cost on the receiving side, amounts are retained in separate cost buckets, as shown in most of the examples. If items use actual cost, then all costs would be rolled into the material cost bucket.

About Multi-Site Transfer Order Lot Tracking

When an item or material is transferred that uses Lot Tracking, processing is driven by the FOB (Free On Board) Site. The FOB Site indicates when change of ownership of the items or materials occurs. The FOB Site controls:

76   Which site owns the items or materials that are in transit (that is, which site's inventory still maintains the quantity on their books until the item or material is received).

77   Where the in-transit quantities are maintained. The Transit Location can belong to the To Site or the From Site.

78   The timing of accounting transactions. Accounting transactions occur at either shipping or receiving.

79   Which account numbers will default. Account numbers default from the To Site or From Site.

When a transfer order is created, either the To Site or the From Site must be indicated as the FOB Site. If the FOB Site is the same as the **From Site**, the goods change ownership at the time of **shipping**. This is illustrated in the diagram below.
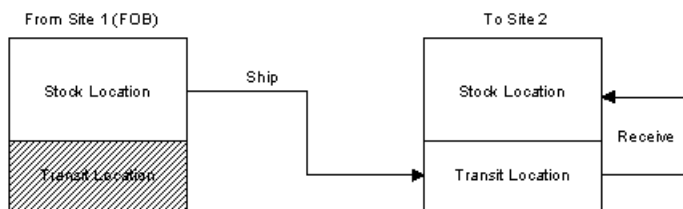
If the FOB Site is the same as the **To Site**, the goods change ownership at the time of **receiving**. This is illustrated in the diagram below.
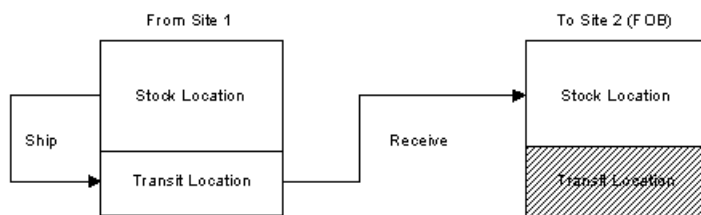
About Multi-Site Transfer Order Receiving

A Transfer Order Receive transaction moves the quantity from the Transit Location to the Stock Location of the receiving warehouse or site. Multiple receipts may be made against a transfer order line item. Returns or mis-receipts can be backed out by entering a negative receipt quantity.

The From Site controls shipping and must perform this process. The To Site controls receiving. The FOB Site, also designated on the transfer order header, determines the timing of accounting transactions. If the FOB Site is the same as the From Site, then the goods change ownership at the time of shipping. If the FOB Site is the same as the To Site, then the goods change ownership at the time of receiving.

Landed Cost

If the FOB site is the From Site, then material is moved during shipment to a transit location belonging to the To Site. At receipt, Landed Costs are capitalized **only for those items using Actual costing methods.**

If the FOB site is the To Site, the material is moved during shipment to a transit location belonging to the From Site. At receipt, Landed Costs are capitalized for **all** items. A receipt record is created during the shipping.

You are able to update the Landed Costs for the item being received if the FOB field for the transfer order indicates the To Site. The values are defaulted from the transfer order line item, but can be overwritten.

About Multi-Site Transfer Order Serial Number Tracking

Multi-Warehouse Functionality During Shipping And Receiving

A hypothetical multi-warehouse shipping and receiving scenario follows:

80 Warehouse A ships to a Transit Location (it is maintained at Warehouse B).

81 When Warehouse B receives the item, it is moved from the Transit Location to a Stock Location within Warehouse B.
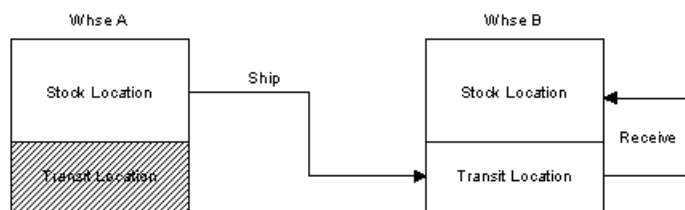
Multi-Site Functionality During Shipping And Receiving

When you move inventory via a multi-site transfer, the transfer is a two-step process:

1 Inventory is moved from a permanent location to a transit location.

2 Inventory is then moved from the transit location to a permanent location.

The following tables illustrate this process.

Serial Number Tracking When FOB = Site B

Site A			Site B (FOB Site)		
Permanent Inventory	Transit		Transit		Permanent Inventory
	In	Out (Status)	In	Out	
I	Same S/N	Same S/N			Different S/N
		Transit			Out of Inventory, Not Used, or New
A	Same S/N	Same S/N			Different S/N
		Transit			Out of Inventory, Not Used, or New
J	Same S/N	Same S/N			Different S/N
		Transit			Out of Inventory, Not Used, or New
R	Same S/N	Same S/N			Different S/N
		Transit			Out of Inventory, Not Used, or New

In this example, an item is transferred from Site A to Site B, where the FOB Site is Site B. Regardless of the status of the serial number used (I, A, J, or R), the item is transferred to the transit location with the same serial number, and out of the transit location with a status of Transit. It is then moved into permanent inventory at Site B, where it is assigned a different serial number with a status of Out of Inventory, Not Used, or New.

Serial Number Tracking When FOB = Site A

Site A (FOB Site)			Site B			
Permanent Inventory	Transit		Transit			Permanent Inventory
	In	Out (Status)	In Status		Out Status	
I			Same S/N	Same S/N	Same S/N	
			Out of Inventory, Not Used, or New	Transit		
A			Same S/N	Same S/N	Same S/N	
			Out of Inventory, Not Used, or New	Transit		
J			Same S/N	Same S/N	Same S/N	
			Out of Inventory, Not Used, or New	Transit		
R			Same S/N	Same S/N	Same S/N	
			Out of Inventory, Not Used, or New	Transit		

In this example, an item is transferred from Site A to Site B, where the FOB Site is Site A. Regardless of the status of the serial number used (I, A, J, or R), the item is transferred to the transit location associated with Site B, and is assigned a serial number with a status of Out of Inventory, Not Used, or New, and out of the transit location with a status of Transit. It is then moved into permanent inventory at Site B, where it is given the same serial number.

Data Collection and Multi-Site Serial Number Tracking

If a transaction is performed that requires updates to the non-local site, and the non-local site is not available, the serial numbers for the other site are generated at the time the transfer order transaction is posted to the system.

Error processing data collection always prompts for serial numbers if either site's item is serial tracked. Error processing data collection allows updates to data even if the non-local site is not available (that is, only the local Infor CloudSuite database is available). In this case the data is validated again at the time the transaction is posted. If the non-local sites' primary database is available, validations also include that site.

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