Advisory

Import Purchasing Requires Special Replenishment Tools

Inventory

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I recently spoke to a STAFDA distributor who purchases a lot of products overseas. We spent quite a bit of time discussing the special challenges presented with the long lead times (typically 90 – 120 days) associated with importing material. He was frustrated with his computer system's poor replenishment suggestions.

His system maintains a reorder point and suggested order quantity for each inventory item. The reorder point is equal to:

(Forecast Demand/Day[1] **X** Anticipated Lead Time[2]) **+** (Forecast Demand/Day **X** Review Cycle[3] Days) **+** Safety Stock[4]

The suggested order quantity is calculated using a version of the economic order quantity (EOQ) and is equal to the square root of:

(24 **X** Cost of Reordering Inventory **X** Forecast Demand/Month) ÷ (Cost of Carrying Inventory % **X** Replacement Cost per Piece)

The economic order quantity is designed to calculate the purchase quantity that results in the "lowest total cost per piece." That's the quantity that maximizes your company's profits. When the net replenishment position (i.e., Quantity-On-Hand **minus** Quantity-Committed-on-Customer-Orders **+** Quantity-on-Replenishment-Orders) drops below the reorder point, the system suggests the buyer purchase the

[1] Demand/Day = Prediction of how much of the product will be sold or used per day

[2] Anticipated Lead Time = Anticipated length of time it will take to order and receive a replenishment shipment of the product (i.e., from purchase order creation date to stock receipt date)

[3] Review Cycle = Length of time between receiving replenishment shipments from the vendor (e.g., we normally receive shipments from the vendor once a week

[4] Safety Stock = Insurance or reserve inventory to protect against unusual demand during the lead time or delays in receiving replenishment shipments

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reorder quantity.

This distributor is experiencing problems because his system only calculates one forecast demand quantity, and this quantity is based on usage recorded during the past several months. As a result, the forecast is an estimate of what usage will be during the upcoming several weeks. This type of system worked well 20 – 30 years ago when the typical lead time for fasteners was seven to 10 days.

But the lead times for import purchases range from 90 to 120 days. If we are reviewing our needs in June, we don't need to know what we will sell in June or July. What we want is what we'll need in September and October, when we will anticipate receiving any material ordered today. If usage of a product is increasing or decreasing, has a seasonal demand pattern or changes over time for any other reason, a forecast for the current month is not only useless, it's dangerous! It will cause the reorder point for the product to be too high or too low. This will cause you to reorder too soon or likely too late resulting in stockouts or excess inventory. It will also calculate an economic reorder quantity that does not result in the lowest total cost per piece. *No wonder this distributor is extremely frustrated!*

Products with extended lead times require a more dynamic replenishment method. We call this method distribution requirements planning (DRP). Various software packages have different features in their DRP modules, but a good DRP system will have these characteristics:

- Calculate a separate demand forecast for each of the upcoming nine to 12 months
- Calculate a separate safety stock quantity for each of the upcoming nine to 12 months
- Project when during the upcoming nine to 12 months you will need to receive inventory to meet the demand forecast.
- Project when during the upcoming nine to 12 months you may have excess inventory (prompting you to try and cancel or delay scheduled replenishment shipments)

DRP Systems start with your current available balance of each item. From this quantity, subtract the forecast for the remainder of the current month and add any stock receipts anticipated for the month. The result is a projected ending balance for the current month. Here's an example:

Month	Item	Current Available	Forecast	Scheduled Stock Receipts	Ending Balance
June	A100	100	50	25	75

We're projecting we'll have 75 pieces at the end of the current month. But we want to have some safety stock on hand in case we sell more than the 50 pieces forecast till the end of the month or the anticipated stock of 25 pieces does not arrive on time. We will subtract our safety stock of 50 pieces from the ending balance of 75 pieces to arrive at an ending stock position of 25 pieces:

Month	Item	Current Available	Forecast	Scheduled Stock Receipts	Ending Balance	Safety Stock	Ending Position
June	A100	100	50	25	75	50	25

We will have 25 pieces more than needed at the end of June and there will be no need to bring in additional stock. We project that July's beginning balance will be 75 pieces, the ending June balance. The forecast calculated by our system for July is 65 pieces. A good forecasting system will consider past usage history, trends, seasonal factors and collaborative information obtained from salespeople, customers and the market. Note that a separate forecast is calculated for each item for each upcoming month. (*Please refer to our previous* Advisories *for more information and advice on forecasting future demand of products.)*

Month	Item	Current Available	Forecast	Scheduled Stock Receipts	Ending Balance	Safety Stock	Ending Position
July	A100	75	65	0	10	30	-20

The safety stock quantity is also calculated separately for each month. We now want to keep 30 pieces in reserve. Because we have no stock receipts currently scheduled for July, we project that we will not have the 30 pieces of safety stock at the end of July. If we subtract the safety stock of 30 pieces from the projected ending balance of 10 pieces the result is a stock position of -20 pieces. We will need at least 20 pieces delivered in July to maintain adequate inventory. If the item comes in a vendor package of 50 pieces, the system will recommend a purchase of one package for delivery in July:

Month	Item	Current Available	Forecast	Scheduled Stock Receipts	Ending Balance	Safety Stock	Ending Position	Additional Needed
July	A100	75	65	0	10	30	-20	50

The DRP system will assume the 50 pieces will be received in July. As a result the beginning balance for August will be 60 pieces (ending July balance of 10 plus the 50 pieces received). We will then subtract the forecast and safety stock quantities for August from the starting available and add any scheduled stock receipts to determine if more stock is needed in August to meet our needs:

Month	Item	Current Available	Forecast	Scheduled Stock Receipts	Ending Balance	Safety Stock	Ending Position	Additional Needed
Aug	A100	60	70	50	40	35	5	0

The projections continue for each item for each of the upcoming 12 months. The DRP system then summarizes the additional quantities needed by month:

Month	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Needed		50		50		100			50		100	

Because a buyer is as interested in when material needs to be ordered as well as when it needs to be received, the DRP system will subtract the anticipated lead time for the item (60 days in this instance) to determine when each needed quantity should be ordered:

Month	Shortfall	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Needed		50		50		100			50		100
Order on the 1st of	50	50		100			50		100		

Note the 50 pieces needed in September will be ordered in July. The 100 pieces needed in November will be ordered in September, etc. It is too late to order and receive the 50 pieces needed in July by normal means so this quantity appears in the “Shortfall” column. A buyer may decide to obtain an emergency shipment of this product by airfreight, obtain some inventory from a local secondary source, or at the very least notify sales of probable stocking problem with the item.

The review or order cycle is the normal length of time between receiving replenishment shipments from the supplier shipments from the vendor. This is the length of time necessary to place a “target order.” A target order allows you to receive the terms or discounts that allow you to competitively sell the vendor’s products. Many distributors want to import full containers. In this situation, a review or order cycle is the length of time necessary to generate enough need to fill a container.

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If you couldn't generate enough need to fill a container every month, you might need to place an order for several months' needs at one time. In the following example, we have a 90 day lead time and a sixty day review or order cycle (i.e., we plan to receive a container from the vendor every other month):

Month	Shortfall	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Needed					2500	1500	1500	2000	1000	2500	3000
Order on the 1st of	0	4000		3500		3500		3000+			

In July we will order what we need to fill October and November's needs. In September we will order what is needed in December and January. November's order will cover the anticipated needs of February and March. January's order will cover the 3000 pieces needed in April plus what we anticipate needing in May (not shown). Because the economic order quantity represents the purchase quantity that will minimize the total cost of each item, purchase quantities in a DRP system should be increased (if necessary) to equal the EOQ.

A DRP replenishment system allows you to project your needs of products with extended lead times up to 12 months into the future. Buying reports of DRP systems will express what needs to be ordered each month in pieces, dollars, weight, and cubic volume. These last two measurements allow buyers to ensure that they are ordering what will fill a container.

A good DRP system is a crucial asset for those distributors who import products. If your system does not include DRP replenishment, consider implementing a "bolt-on" software solution that has these capabilities. It will be of tremendous value as you strive to achieve effective inventory management.