Back to Basics
Part 5: Replenishment

This article is part 5 of a 12 part series where we focus on warehouse fundamentals that are critical to success. In any sport, hobby, or skill, a mastery of fundamentals means better performance. And we think warehouses are no different. Read on to learn more, touch up on the basics, or compare your operations to the best practices we'll highlight in each article of the series.

We continue our Back to Basics series with a focus on replenishment. Replenishment is the process of relocating reserve stock to forward pick locations. These locations can either be loose pick locations or forward case pick locations.

Proper replenishment placement and timing is critical to the efficiency of the picking team. The product must be located in the directed pick location when an operator reaches the pick face. Waiting for restocks causes unwanted downtime or incorrect order fulfillment.

However, the replenishment process can be rather time consuming. It needs to be properly managed to balance picking efficiency gains and the replenishment labor.

Replenishment Determination

There are many ways to determine how and when to replenish pick faces to maximize efficiencies. Number of pick faces, fixed or floating pick locations, and size of the forward pick location need to be considered when determining how to replenish. With any loose pick replenishment alternative, if space and demand allows, consider rounding up to an inner pack quantity or case quantity to minimize labor in the reserve locations. With case pick replenishment alternatives, try to replenish with full pallet quantities to save time.

It is important to select a proper replenishment method:

- Day or Wave Demand Replenishment – This method is used to move only the quantity needed to satisfy the demand for each wave (or day) to the forward pick locations. This works well for unpredictable SKU demand or very slow moving SKUs. This method also works well when the pick faces are smaller and can only fit the demand qty.

  If the SKU/location assignment isn't permanent (floats), day or wave demand replenishment helps manage the clean out of the locations very frequently. It doesn't work as well if SKUs have predictable or

faster movement, since that may cause multiple visits to the same pick face for each wave.

- Opportunistic Replenishment –In this method, the replenishment quantity is based on two to four weeks of forecasted fulfillment quantities. By minimizing the number of trips to both the reserve and pick face location, productivity increases.

  For example, if the wave demand is for four units but the two week demand is for two cases, opportunistic replenishment would require the move of two cases to the pick location. This potentially eliminates additional moves in the same two week period. The trigger for this type of replenishment can be a minimum quantity, wave demand (if quantity in pick face is less than wave demand), or reports.

  This type of replenishment is not ideal if the pick face locations are too small to handle the additional product volume, if the forecast or demand is extremely unpredictable, or if there are limited forward pick locations. With limited forward pick locations, the forecasted SKU could consume the location for a longer period and not allow cleaning the location for reuse after each wave.

- Top Off or Lean Time Replenishment – This method utilizes down time to fill each fixed location to its maximum cubic quantity. An operation selects this method when their picking window is tight, in order to remove the time-consuming effort required to complete the replenishment step prior to picking.

  An important assumption with this method is that minimum and maximum quantities are set up properly. If locations or SKUs that are expiring are topped off, it creates clean up or reslotting issues later. Only use this method with faster moving or consistently performing SKUs when time allows.

- Combination – This type of replenishment utilizes a combination of the above methods. This method is usually triggered by a day's demand or minimum quantity, but then fills the location to its maximum cubic capacity or the two (or four) week projected demand.

  The benefit of using a combination is that efficiencies will still be gained on the picking side, but minimum reslotting is required because demand would initially dictate the replenishment. Once again, the assumption is that the projections are correct. If not, reslotting may need to be done on slower moving SKUs. If the sell curve of a SKU or group of SKUs is initially high and then dramatically plunges, this method should not be used.

- <u>Emergency Replenishments</u> – These are typically utilized when a picker goes to a location that lacks the correct product and quantity. In this case, the picker moves the problem order or pick carton to a resolution area and continues on with a different order or carton. A resolution specialist or runner is then notified about the missing item. The resolution specialist makes sure the item is not in the expected pick location or surrounding locations, performs a cycle count, and tells a runner which reserve location contains the missing SKU.

  Once the location is considered resolved and replenished, the unfinished order is then completed. In more automated operations, a short at the pick location triggers the same action. It is important that the problem carton be clearly identified so it does not get accidentally shipped prior to the issue being resolved.

Forward Pick Location Assignments

Another huge impact on replenishment efficiency is the type of forward location slotting assignment. Replenishment impacts the efficiencies of picking (both fulfillment and restock) and inventory control (reslotting). The wrong item in the wrong location can destroy picking rates or cause extra reslotting work in the future. When setting up your replenishment processes, determine whether fixed or assigned locations or floating locations will work best with your operation.

<u>Fixed or Assigned Locations</u>

Many operations utilize fixed (or assigned) locations. These operations typically have smaller SKU bases, large forward pick areas or predictable SKU movement. With fixed locations, a SKU or SKUs are assigned to a specific location and only those SKUs are allowed in that location.

Typically, minimum and maximum quantities for each assigned SKU are determined. The minimum and maximum are set correctly by evaluating both the cube of the item (how much will fit in the location) and the case or inner pack quantities. Replenishments from reserve locations are most efficient when case quantities are brought forward.

When using fixed locations, each SKU that warrants a forward location typically is assigned at least one. Minimums and maximums help control the amount of product replenished at any one time and reports can easily be run to determine if location types need to be adjusted.

This method's drawback is that slow movers can take up precious forward pick locations if movement is not watched and reslotting efforts stall. Inventory issues are also harder to spot since the location assignment doesn't change, and FIFO is more difficult to enforce.

Floating Locations

Floating locations are utilized when the cubic movement of an item changes often. The location type is determined during replenishment. Most often, the current location for an item is picked to zero and when demand or forecasted quantities trigger a replenishment, the total cubic quantity needed for that item is determined. That cubic quantity drives the new location type for that item.

For example, if an item has been in shelving and has a wave requirement for four times the cubic capacity of a shelf location, the system would then upgrade the item to a new location that fits the higher cubic quantity. The item may now be assigned to a carton flow rack location. Depending on the replenishment logic utilized, the replenishment would only bring forward the wave quantity (demand replenishment) or it would top off the location by filling the carton flow rack location.

With floating locations, it is important to limit the number of total locations by location type allowed per item. This prevents any one item from taking too many locations of one type prior to upgrading the item to a larger cubic capacity location type.

Floating pick locations provide the ability to cycle count as the item is being replenished. When replenishing to true floating pick bins, the replenishment is always to an empty location.

Good Replenishment Practices

Replenishment operations need daily finessing to make sure they are meeting picking's requirements and minimizing overall labor.

Forward Picking Reslotting

Reslotting is the process of identifying if a slotted item is in the wrong forward pick location. The easiest way to determine if an item assignment should be changed is to run a report that shows the cubic movement of an item for a set time period compared to the location cube.

The cubic movement of an item is calculated by multiplying the piece cube by the total number of picks for a set period (usually the same replenishment time period utilized in the forecasting method). Items which show very low cubic movement compared to their location need to be downgraded to a slower or smaller cube location, and higher cubic movement items need to be upgraded to a faster or larger cube location.

If there is a change in cubic movement of an item, the best time to reslot the product is during replenishment. Allow the location to be picked clean and then, during replenishment, direct the item to a new location. With fixed

locations, the assignment of the item must be removed from one location to the new location. Minimums and maximums must also be changed. This helps minimize the labor intensive task of reslotting items and ensures movement of the SKUs match the proper location types for maximum picking and replenishment efficiency.

Managing Replenishment Overflow

Occasionally, an overflow of the forward pick location will occur during replenishment. In some cases, the location min/max or size wasn't configured properly or the demand increased over time. In other cases, the requirement is just an abnormal spike. If the replenishment demand quantity for an assigned item is greater than the location will hold, there are several options to handle the situation temporarily:

- "Hot" replenishments can be configured to occur as the assigned location empties, sending high priority tasks to a replenisher. Timing is critical to the picking efficiencies; pickers should never be waiting for product.
- Overflow backup locations can be assigned to multiple forward pick locations. In this case, the picker would need to know where to go to do an "on the fly" replenishment in order to continue picking.
- Some available forward locations can be set up as floating locations. If multiple locations are needed for one item, a floating location could be used for that wave specifically.

If this overflow happens often to an item, consider reassigning that item to another type of pick location with a larger cubic capacity (for example, upgrading it from a shelf to a carton flow rack location).

Use of Check Digits on Location Bar Codes

A check digit is a randomly generated two position alphanumeric code. This code is usually buried in the bar code pasted to the location so it cannot be read and entered manually on an RF gun by an operator. The code ensures that the person scans the bar code rather than manually typing in the location for location putaway confirmation. This helps minimize operator short cuts and assists in verifying location accuracy.

An alternative is to utilize separate putaway and pick barcode scans. This works best when replenishing from one side while picking from the other.

Replenishment Picking from Reserve

To maximize efficiencies when performing less than full pallet replenishments, consider whether the pull from reserve or the putaway into the forward pick location is the bottleneck. If it's maximizing the pull, combine the total replenishment requirements by item and visit the reserve

location only one time. If there are replenishments for other items in the same general reserve area, add those pulls onto the same pallet. When all picking is completed or the pull pallet is filled, the pallet should be dropped off to an area where the items are sorted by pick location area. Sorting into pick location area is a cumbersome process which requires space and time.

If maximizing the putaway process, pull the product according to the pick location areas. Only items destined for a particular pick location area should be pulled onto a single pallet.

This may mean that the same reserve location or aisle is visited more than once to be placed onto different pull pallets. However, this also eliminates the need for sorting by the pick location areas for putaway because the pull pallet now becomes the sorted pick area pallet for putaway. This tweaking requires a compromise between pull efficiency in the reserve area (one run through reserve per put area) and put area segregation.

<u>Detrashing Cartons</u>

Dealing with left over corrugate can also impact picking efficiencies. Many companies are moving toward emptying the carton into the pick slot or removing the top and slitting the side of the carton during the replenishment process. This minimizes picker down time caused by prepping the pick location, opening cartons and discarding corrugate. It also removes much of the waste prior to the start of the picking process. For safety reasons, lexan guides can be used to place between the product and the corrugate in order to reduce cutting damage.

<u>Replenish Directly From Receiving</u>

Items can be directly replenished to a forward pick location from the receiving dock if they are expected to be picked in the near future. This eliminates extra moves into storage, only to later be replenished. This practice works best when an item has many backorders against it, is a new release item with planned sales, or has a high forecast volume in the near future. Be careful to assign the appropriate location type based on the forecasted cubic volume, and note that this approach can be problematic if FIFO is a concern.