



Distribution Center MANAGEMENT

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Managing people, materials and costs in the warehouse or DC

From the Golden Zone

Creating a partial pallet area can reduce travel time and improve productivity

By Jack Kuchta

All warehouses have partial pallets occupying full pallet positions. For some warehouses, this may be no more than a statistical element in calculating warehouse utilization if the facility is operating comfortably below its maximum effective working capacity. When the warehouse is nearly full, however, partial pallets can have an impact. It may be useful to compare the cost of relocating material to the cost of keeping the partial pallet in place.

The three principal factors in the calculation are:

- **The partial pallet turnover time.** This is the number of days that half pallets or less remain in storage.
- **The cost of relocation** calculated as the fully burdened labor cost of moving the partial pallet to a half pallet size location.
- **The daily cost of a pallet location.** For this cost, I use the total non-labor building costs of the storage space — total building cost times the percent of the building used for storage divided by the number of pallet locations.

When the partial pallet turnover time multiplied by the daily location cost exceeds the relocation cost, it is time to create a partial pallet area.

Configuring the partial pallet area

What, then, should the partial pallet area look like? The simplest and most straightforward approach is to reconfigure the pallet rack in the area with smaller openings. The openings should be somewhat more than one-half the size of a standard opening (that is, the size of a half pallet plus the lift-off height.) The re-warehousing rule is simple; move the pallet to the partial area when it falls below one-half of a pallet. The only cost involved is the initial purchase and installation of the additional beam levels and the labor to relocate the pallet.

The downside of this technique is the space inefficiency that results. Each new location has a beam, a lift-off space, and a pallet that occupies vertical height. This may not be an effective space trade-off. As an example, if the standard load height on a pallet is 48 inches, the relocation saves 24 inches of vertical space. But it costs four inches for the beam plus six inches for the pallet and perhaps six inches of lift-off. The result is a mere eight inches of vertical height saved.

Each choice requires a trade-off of space and labor efficiency versus operating and/or capital costs.

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Another alternative is to put two products on a single pallet. Using this technique does not require changes to the racking system. It does, however, require labor to restack the pallets. Some care must be taken in deciding what two products to put on a pallet, as it may be confusing to the pickers if the cartons are similar in size and appearance. It is wise to create a unique location within the system that holds the inventory by distinguishing the left and right sides of the pallet/location.

A less-than-pallet storage module

Further along the complexity scale is abandoning pallets altogether and using a less-than-pallet storage module. This might be decked rack, bin shelving, or something more complex, such as a carousel, mini-load, or vertical lift module. Each of these involve a comparison of the trade-offs between vertical and horizontal space utilization, operating labor, and initial system cost. Decked racking might require the smallest change to a warehouse, but it usually sacrifices horizontal space efficiency due to the pallet handling size of the aisles, depth of the racking, which may be hard to reach, and the vertical efficiency because of the thickness of the beams. Bin shelving eliminates

those concerns, but presents limitations on the vertical height due to module stability. Of course, the other solutions have an initial cost hurdle that must be overcome.

The last alternative is to re-evaluate the capacity of the forward pick locations so that partial pallets are in whole or in part eliminated from the storage locations. Evaluation of this alternative is complex enough to only be considered as part of a total re-evaluation and re-configuration of the facility and support systems.

As is the usual case with any element of the supply chain, each choice requires a trade-off of space and labor efficiency versus operating and/or capital costs. There will also be choices that derive from the short-term impact of the disruption, to the operation during the change, and the life span of the effectiveness of the change. No alternative should be selected without consideration of all the consequences of the decision.

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