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Ontario's Business & Industrial Equipment Magazine

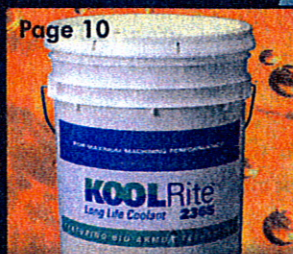# Choosing the Right High-Density Storage System

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Choosing the Right High-Density Storage System

Manufacturers' warehouse requirements for finished goods are far different from warehousing requirements of retailers and wholesalers found downstream in the supply chain. Characteristically manufacturers stock fewer items and more of them. The result: large inventories per item create the need for high-density storage systems.

There is an implicit danger in investing in a storage system that simply provides the greatest number of pallet positions per square foot. The danger being that the gross pallet positions available are not necessarily the net positions that can readily be used. Therefore without careful consideration, the workable capacity provided by a given storage system may be dangerously over-estimated.

Consider a bulk storage lane on the floor. Suppose it accommodates 4 pallets deep and, by stacking two pallets high, yields a capacity of 8 pallets in total. Keep in mind however, that before replenishing that lane it must be filled and subsequently picked clean prior to put away of new product or another lot of the same product. So although the lane begins full only when it's empty can it be filled again. This means at any point in time, on average this lane is only ever half full.

What looks like a capacity of 8 pallets is, in effect, a capacity of 4 pallets. In an entire warehouse if every bulk storage lane followed this trend, 50% of the gross capacity of the building would remain unused. Unless, to make increased use of the gross capacity, operators mix items or lots in a single lane and re-handle pallets to maintain utilization rates closer to the gross capacity. The drawbacks of such an approach are that it puts inventory control at risk and greatly impacts operator productivity.

The general principle outlined above describing the danger high density storage poses also applies to drive-in and drive-through racking – however it does not mean that these storage systems are always poor choices for your warehousing needs.
Returning to the example of bulk storage lanes, consider the utilization of gross capacity when an item occupies two lanes. One lane has a 50% capacity but the other, which serves purely as a storage lane until the former is picked clean, has 100% capacity used. This brings the net utilization up to 75%. If an item can occupy three lanes, that utilization jumps to 83%.

What this second bulk storage example illustrates is that maximizing the gross capacity of a warehouse depends on matching a storage system to the inventory profile of the items stored in that system. Without a careful consideration of the inventory profiles held in the warehouse and a realistic appraisal of the net utilization achievable, the wrong storage system will be employed.

Another example of matching a storage system to the inventory profile of product stored in that system comes in the form of "end of run" pallets. Production runs never yield full pallets of finished goods: there is always a balance of product that makes for a small or partial pallet. Fitting these partial pallets into a uniform storage system conceived for full pallets will always result in lost storage capacity.

Consider storage openings of 56" which are optimal for pallet heights of 52". Let's say however, that an end of run pallet is only 28" high – this leaves 24" of unused capacity or a 56% net capacity utilization applicable to each end of run pallet stored.

The number of end of run pallets in a warehouse, while small in total, can lead to significant losses in available storage capacity unless the storage system design incorporates considerations for these pallets. Options available include smaller pallet openings within the larger system or, perhaps, a separate section of the warehouse dedicated to smaller pallet storage.

In conclusion, operations managers can make significant gains by keeping a few things in mind when looking at the best way to store finished goods.

1) Gross capacity of a storage system is not the same as the net capacity.

2) Net capacity is a function of the inventory profile of products stored in the system.

3) "End of run" pallets complicate the effort to yield the highest net storage capacity of a given system.

4) When a storage system is mis-matched to the inventory requirements, capacity drops and/or warehouse productivity suffers.

Careful, thorough storage system design decisions upfront will avoid years of headaches and burdensome costs in the future.

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