

# SPACE UTILIZATION

**Distribution centers must work to relieve congestion through cost-effectively optimizing the space utilized within the four walls of the facility.**

Many times, finding room in your distribution center (DC) for product and necessary processes ends up being a game of Tetris. Ineffectively placed pieces decrease your time to react, space starts getting tight, and placing new pieces becomes a challenge. But in reality, you can't simply get a clean screen to start over within your DC. Distribution centers must work to relieve congestion through cost-effectively optimizing the space utilized within the four walls of the facility. Through implementing both innovative and long-standing tactics for space utilization, companies can advance their operations to distribute on demand.

When available space is minimized, it is very likely picking and putaway efficiency will also decline. In order to increase productivity and forgo expansion, space-consuming practices and procedures need to be properly addressed. While there are hundreds of effective tactics to utilize space within a DC, the solution requires a two-pronged approach: minimizing space requirements and maximizing space utilization.

## MINIMIZING SPACE REQUIREMENTS

System maintenance is a key factor. The value of warehouse management and other software systems is widely understood in distribution, and yet failing to keep these systems tuned is a potential space consumer. Product item master information that affects storage rules in putaway logic, slotting, and other functionality must be kept current. Storage inefficiencies can result from inaccurate product dimensions, pack quantities, or pallet sizes.

Partial pallets and partially filled storage locations, like the poorly placed Tetris pieces, are of little concern until things get tight. Often viewed as non-value-added work, combining partial pallets, consolidating block (bulk) stack pallet locations as product moves out, and relocating partial pallets to smaller locations are processes that are mandatory when space is at a premium. If warehouse personnel can bypass first in/first out (FIFO) rules they can direct partial pallets to pick locations or replenish pick locations with partial pallets first.

Work with your suppliers to provide storage relief. They may schedule smaller shipments more frequently to reduce the amount of inventory on hand, or they may be able to drop ship directly to your customers.

Dust-covered cartons are indicative of wasteful storage. While often out of DC managers' control, it is advantageous if excess inventory or obsolete SKUs are properly addressed. This is a challenging discussion which may involve various players throughout the organization, but it is a necessary effort when faced with outside

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storage and/or expansion costs. Holding on to a discontinued SKU within your DC ineffectively uses precious space and a decision has to be made as to disposition. Excess inventory is hard to manage and harder to prevent when confronted with rapid changes in demand.

Product slotting in pick areas is another maintenance consideration. Done by expert analysis or through slotting software applications, slotting manages the location of SKUs based on dimensions and weight considerations, pick velocity, and family groups (style, store or vendor). Storage media optimization requires determining the best storage media (pallet, shelving, flow rack, etc.), and the amount of space required within the media, based on the product's cube velocity. Ongoing slot maintenance may regain space when faced with the proliferation of SKUs, postponing expansion of pick areas.

While not an overnight solution, it may be advantageous to evaluate product packaging redesign as a way to decrease space requirements. This could lead to additional benefits such as decreasing packaging costs and freight costs.

## MAXIMIZING SPACE UTILIZATION

Use the cube. We've heard this time and again, and we usually do a good job at it. Nonetheless, voids continue to appear between those Tetris blocks when things aren't done just right. Most people use their floor space well, filling every open spot possible; however, they may not be using this floor space efficiently or effectually using the height of their buildings.

For pallet storage, there are a number of options—block floor stacking, drive-in/drive-thru racks, double deep rack, pallet flow rack, pushback rack, selective rack, etc. There are also many choices for small item or carton storage—bin shelving, wide-span shelving, carousels, drawers, etc. With all these options, there are some basics to keep in mind.

As space utilization increases, flexibility and access usually decrease. With pallets, the greatest flexibility comes from selective rack where any pallet can be accessed directly without moving other pallets and, if the rack beams are uniformly spaced for the largest loads, any pallet received can be stored in any location. There is a space utilization cost for this flexibility.



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If selective rack is right for your business, as is the rule rather than the exception, store as high as practical (six high versus four results in a 50% gain per square foot), and select configurations to store two or three pallet heights. A limited number of storage locations set up for short or partial pallets will increase storage with minimum impact on flexibility. Short pallets can always be stored in larger openings so err on the low side when determining the quantity to setup. Safety should also be kept in mind; product that comes with short pallet heights is usually crushable or very heavy. Rack beam and rack upright capacities must be checked before double stacking these loads or adding additional storage levels to existing rack structures.

With selective rack, also do your homework on equipment types versus aisle widths. Narrow aisle configurations with reach trucks and very narrow aisle (VNA) with man-up turret trucks vary in storage density and equipment price points.

Foregoing flexibility, the other options in pallet storage may be right for your business, especially when fewer SKUs and higher volumes per SKU are involved. Block stacking stable, firm product to four or five levels, several pallets deep and wide, provides excellent space utilization. The product must be right for the application, FIFO or lot control may come to play, and consolidation to free up floor space for other products over time is a necessary labor expense. Similar issues arise with the pushback, double deep, and other methods that provide excellent space utilization that must be balanced with flexibility, initial cost, operating costs, product mix, and product variability to maintain a Distribution On Demand facility.

Non-storage areas that occupy a significantly smaller portion of most facilities should not be overlooked in your quest for space. Hanging conveyor and other equipment such as void-fill systems from the ceiling frees up floor space and improves forklift traffic flow and safety. Spiral conveyors and vertical lifts are useful substitutes for incline conveyor when horizontal space is limited due to proximate aisle ways.

Mezzanines are also effective ways to free up floor space and improve personnel and traffic flow patterns. These raised work areas can be used for a variety of needs such as office space, value-added services, quality assurance, conveyors and processing equipment, supply storage, part rooms, or file/record storage. Mezzanines are very effective when used over dock and staging areas.

When space is tight, remember to simultaneously maximize space utilization and decrease space requirements. Distribution On Demand is achieved when companies can respond to changes in demand while shipping customer-compliant orders at the least cost. This requires inventory to be readily accessible and accurate, which is not customary when available storage space is scarce. There are numerous cost-effective ways to maximize space utilization without expansion, and there are many ways to decrease space requirements through continuous process improvement. Often times the biggest challenge is identifying which is most appropriate for a particular operation.

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