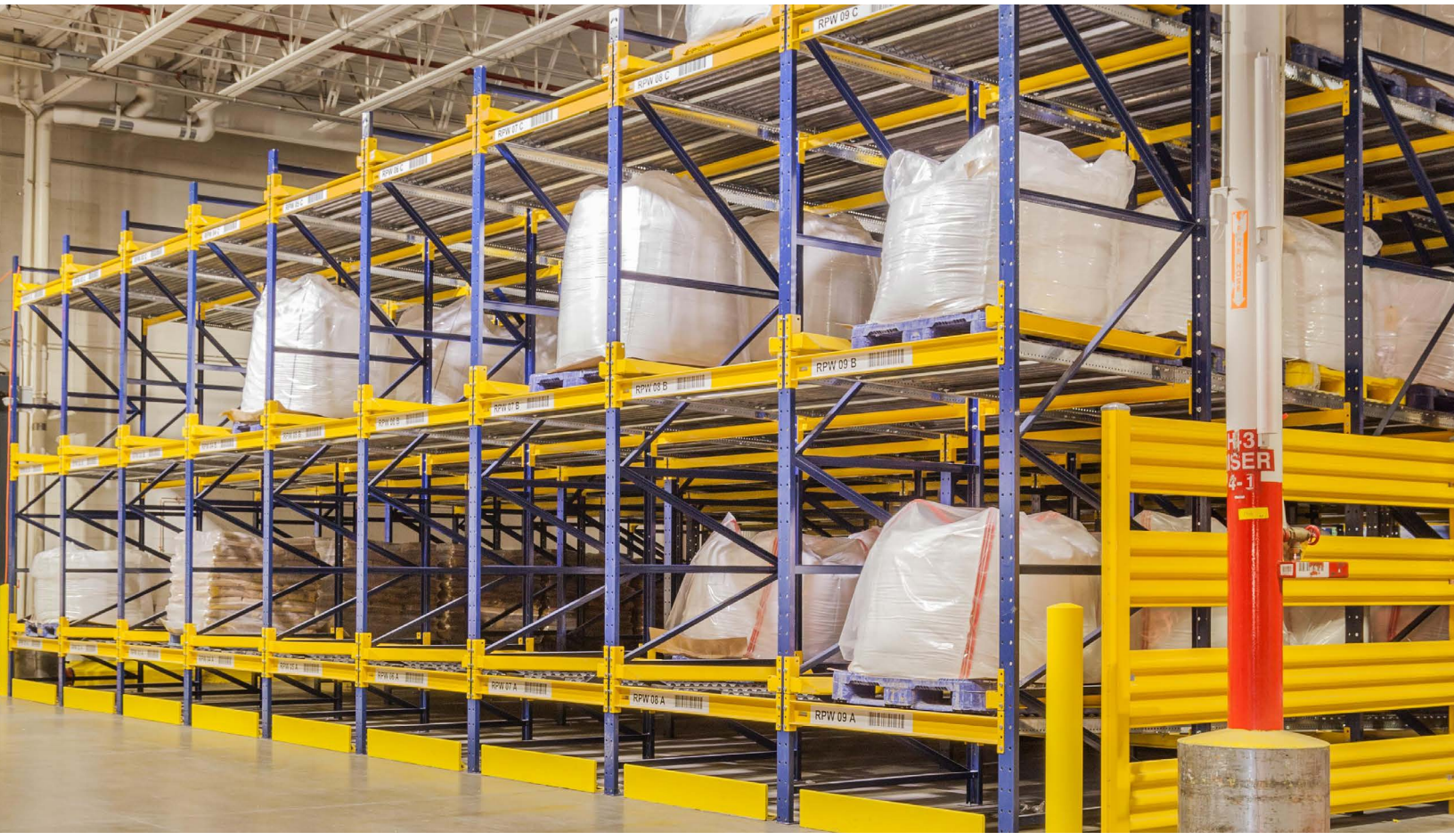
Logistics MANAGEMENT

SUPPLYCHAIN MANAGEMENT REVIEW

Rethink the Rack: Maximizing Warehouse Efficiency with Diverse Storage Solutions



How companies are optimizing their warehouse and DC operations by exploring alternatives to traditional selective racking.

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On the surface, warehouse racking is pretty straightforward: upright frames and horizontal beams work in tandem to support both palletized and non-palletized goods.

Peel back the layers a bit and it's clear that racking is not a "one-size-fits-all" investment for the typical DC or warehouse. Certain products require different types of racking; storage needs vary from one company to the next; and everything from seismic features to fire ratings must be factored into the equation.

These and other variables are forcing companies to "rethink the rack" and explore alternatives to traditional selective racking. And while traditional selective pallet racking is a versatile option, it's not always the best fit for every facility. That's where push-back, pallet flow and semi-automated racking step in to offer key advantages like denser storage, improved efficiencies, safer operations and lower costs.

STORING MORE WITHIN THE SAME SQUARE FOOTAGE

Ask any warehouse manager what their top concern is right now and they'll tell you that they need to be able to process a higher volume of orders in their existing warehouse space—smack in the middle of a persistent labor shortage.

With global e-commerce sales on track to reach $8 trillion by 2027—up from $5.8 trillion in 2023—companies are reassessing their current warehouse setups and taking steps to future-proof their operations.

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— Craig Heil, specialty products manager, Steel King

E-commerce isn't the only driver behind these changes. Companies also have to factor seismic requirements and fire codes into the rack selection process, knowing that both can significantly impact those decisions. They're also looking for ways to maximize any unused vertical space and exploring options that go beyond optimizing flat floor space, all with the goal of getting product out the door more effectively and efficiently.

"We're at a point where selective racking isn't necessarily the obvious path anymore," says Craig Heil, specialty products manager at Steel King Industries, Inc. "Once companies start considering how to store more pallets in their facilities, make better use of vertical space or move goods through their facilities faster, alternative racking options start to look a lot more suitable and compelling."

Take the company that's in growth mode, but doesn't have the funds to go out and lease a new building right now. In lieu of that physical expansion, the organization began exploring how to store more product within the same footprint. Using high-density storage, the company can eliminate aisles and start picking loads faster, whereas standard racking is generally organized as a long run of bays that are just a single pallet deep.

"With selective racking you may have to pass 20 bays to get to the pallet you need," says Ryan Wachsmuth, Steel King's southeast regional sales manager, "whereas dynamic and high-density options allow you to 'condense' the rack footprint and put product within closer proximity." For example, rather than putting 20 pallets away in 20 different bays, high-density racking allows all 20 pallets to be stored in two bays.

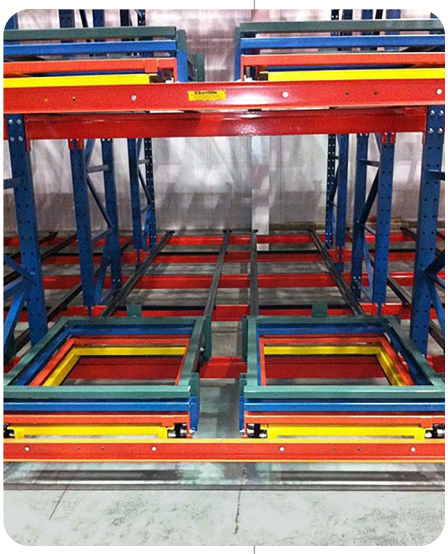
This not only saves labor (since five individuals aren't traversing 10 different lanes), but it also improves throughput, reduces potential workplace hazards and helps companies make better use of their existing physical footprints. "Once you reduce the amount of aisles that you have," adds Wachsmuth, "your entire operation becomes more efficient at getting products from point A to point B."

THINKING OUTSIDE THE RACK

Whether they're outfitting a new facility or overhauling an existing warehouse, more companies are exploring alternatives to traditional selective racking. Among the most popular options are push-back racking; pallet-flow racking; and semi-automated, deep-flow racking. Each one comes with its own features and benefits, and all three are applicable for nearly all industries. Here's a look at each one and how it works:

Pushback Rack Systems

A pushback rack system fills the storage cube with product, not aisles. You can store pallets 2- to 5-deep while retaining easy access to a variety of different SKUs. With pushback rack, pallets are placed by forklift on nested carts riding on inclined rails. Each pallet is then pushed back by subsequent pallet loading, exposing the next cart.



When removing product, the forklift takes out the front pallet, allowing the pallets on carts behind it to roll gently to the front of the rack. The nested carts make placement and retrieval easy and—unlike drive-in racks—each level is independently accessible.

Pushback rack also offers built-in inventory management via a color-coded cart system that allows easy viewing of the inventory (e.g., in a 5-deep system the four carts would all be different colors). Instead of having to get on a scissor lift to count pallets, employees can simply "walk the aisle" and judge based on the respective cart colors.

Using a last in-first out application, pushback rack features a simple physical structure that expands upon the best aspects of selective racking. Each level of pushback racking offers the multi-level deep storage, with loads being placed on a movable cart. As pallets are loaded onto those carts, the carts are indexed back into the system (and vice versa), with gravity feeding them back towards the front of the system.

By moving to a pushback system, the warehouse that was previously using a group of 20 bays to store 100 pallet positions can cut that number of bays in half and still store the same number of pallet positions. "The real estate that you once needed has been cut by 50% or more by switching to pushback racking," says Heil.

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Flow Storage Systems

A flow storage system comprises two parts: a static rack structure and dynamic flow rails. The flow rails are set at an incline in the rack structure, allowing loads placed on one end of the rack to move down to the unloading end.

Rollers let the loads move smoothly while self-energized speed controllers act as gentle brakes. As a load is removed, the loads behind it move forward automatically. The flow system's depth, height and width are limited only by the size of the facility and the related material handling equipment capabilities.

High-density flow storage systems use a first-in/first-out inventory management approach. When the first pallet is removed, gravity kicks in and moves the next pallet into the right location. "The user doesn't really have to do anything," Heil explains. "The system is always going to bring that next pallet forward, effectively saving both time and effort in the process."

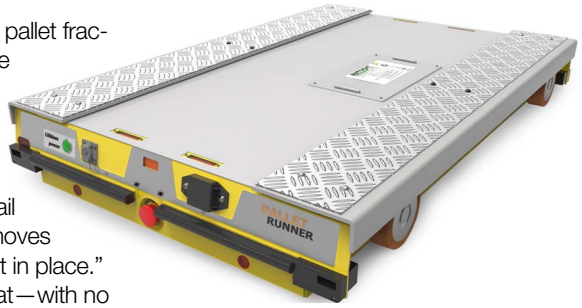
Wachsmuth says flow storage systems are particularly suitable for DCs that have a lower number of SKUs, but move a high volume of product around on a daily basis. Flow storage systems also offer more pallet depth than selective or push-back racking does, and can be customized to manage pallets anywhere from two to 30 deep.

All industries use flow storage systems, with food and beverage being one of the biggest users of these systems. These solutions tend to be highly customized and meant for high-SKU/large quantity shippers that must pay close attention to details like product expiration dates.

Semi-Automated Deep Lane Storage Systems
Semi-automated deep lane storage systems are very suitable for applications that manage a low number of SKUs, but have a high volume of product throughput. Steel King's semi-automated solution utilizes Automha Americas's Pallet Runner™ lithium-ion powered pallet shuttle technology to create a turnkey solution for companies looking to streamline their storage processes, maximize their current space and reduce operational costs.

Here's how it works: Pallets are loaded into the racking system by fork truck and transported into deep lanes by the cart. Once the load is positioned the cart returns to the front of the system to receive the next pallet. The cart performs the deep lane transport, freeing the lift truck operator to travel only between load source and lane entry.

Being able to automatically store pallets many positions deep within the racking maximizes productivity and minimizes fork truck travel distance, while increasing storage density. In this configuration, multiple facility aisles can be removed, replacing them with storage space, increasing the overall storage density in the operation.



"The runner picks up the pallet fractions of an inch above the rail and drives itself all the way down to the opposite end of the system," Heil explains. "The pallet rests on the rail and then automatically moves forward for the next pallet in place." Because the system is flat—with no slope—it helps warehouse operators make better use of their existing floor-to-ceiling space.

Semi-automated deep lane storage solutions can also be programmed to leave extra space between loads, effectively addressing fire and insurance requirements for more "gaps" to ensure a flow through of water in case of a facility fire. This solution allows companies to work from a single front-end location, versus needing a new aisle to manage every 2-4 loads. By minimizing forklift movement on the floor, companies can also count on fewer hazards and less workplace accidents.

UNLEASH YOUR WAREHOUSE'S POTENTIAL WITH THE RIGHT RACK

Selecting the right warehouse racking requires careful analysis, a good evaluation process and a vendor that understands your facility, operations and future goals. For best results, Wachsmuth tells companies to get everyone involved in the decision-making process, including all of the associates who will be using and interacting with the racking on a daily basis.

"Racking is the kind of thing that seems simple in theory; but in reality, there's a lot that goes into this aspect of your operations."

— Ryan Wachsmuth, southeast regional sales manager, Steel King

"Talk to the forklift drivers who will be loading and unloading the system; they're often the best source of input and feedback on what's going to work best for your specific application," Wachsmuth advises. Those individuals will also be able to share input on the restrictions that they're currently facing and any concerns they have about the proposed alternatives. "Open the lines of communication from the forklift drivers to the maintenance personnel to the C-level executives," he adds. "Don't make a decision without talking to everyone."

Heil also advises speaking to insurance providers and your local municipality about requirements and codes *before* installing your new racking systems. And do a one final "sit down" before kicking off the project to discuss the finalized details and ensure that everyone is on the same page. "Racking is the kind of thing that seems simple in theory," Wachsmuth explains, "but in reality, there's a lot that goes into this aspect of your operations."

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