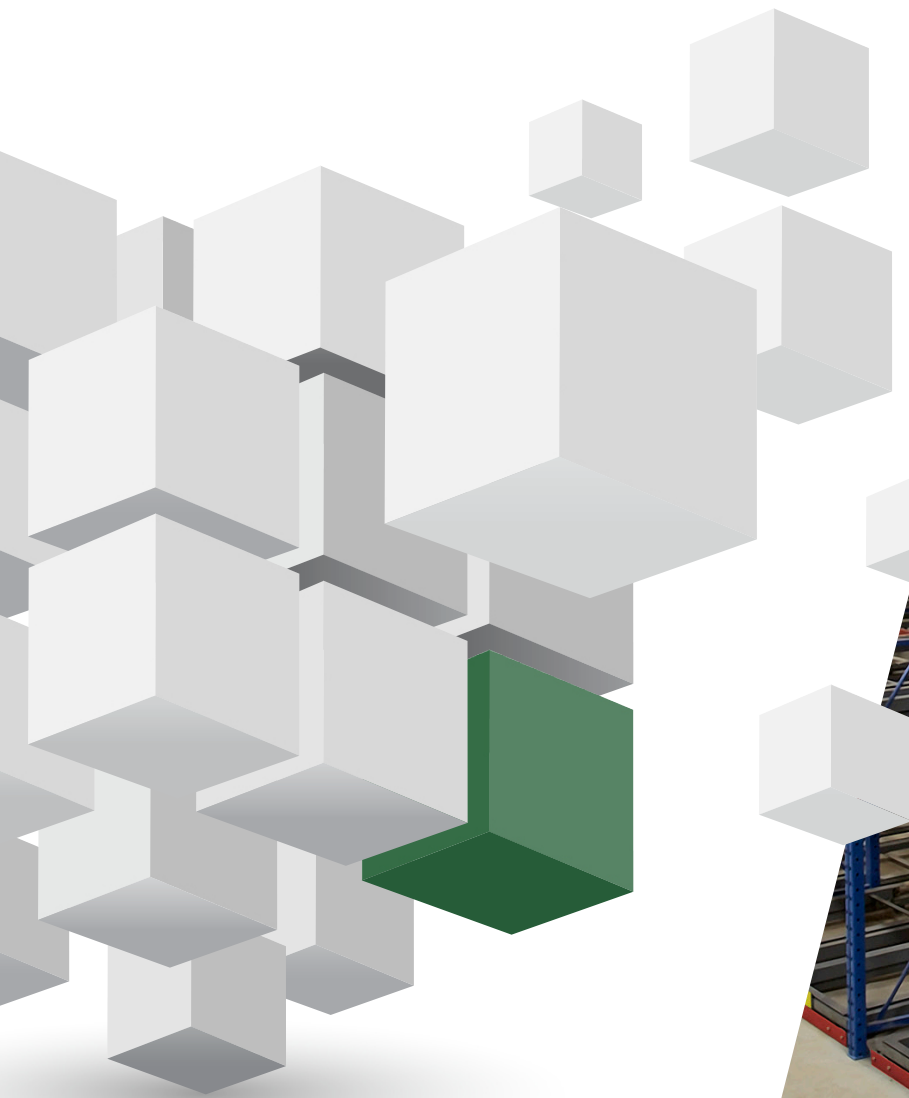


3D STORAGE SYSTEMS



PUSHBACK PALLET RACKING

A DYNAMIC HIGH DENSITY
STORAGE SOLUTION

WWW.3DSTORAGESYSTEMS.COM

PUSHBACK PALLET RACKING



HOW DOES PUSHBACK WORK?

A pushback lane consists of nested carts sitting on top of a pair of inclined rails. The first pallet is loaded from the front, it sits on the first cart. When the second pallet is loaded, it pushes the first pallet behind it back one position. This process continues for up to six pallets deep.

To remove a pallet from a pushback rack, the fork truck driver lifts the pallet off, reverses slowly and the next pallet comes forward and into the front position. This operation is repeated until the lane is empty.

WHY A PUSHBACK SOLUTION?

When the average number of pallets per product exceeds five, a pushback solution is justified. The higher the number the deeper the lane, and the easier it is to achieve FIFO rotation.

- Increased density
- 85-95% occupancy
- FIFO stock rotation
- Low handling costs
- Random storage on all levels
- Low product and rack damage
- Efficient bottom level case picking
- System flexibility

Our pushback pallet racking systems are installed in a wide variety of industry types including:

- Food & Beverage Distribution
- Manufacturing
- Third Party Logistics Facilities
- Automotive
- Pharmaceuticals

OUR PUSHBACK PALLET RACK SOLUTIONS ARE UNMATCHED.

We sell our products through an extensive network of experienced material handling dealers.

1-877-830-0003

mail@3dstoragesystems.com





MARS PET CARE

COLUMBUS, OHIO

CLIENT

A global manufacturer of confectionery, pet food, and other food products and a provider of animal care services, with US\$33B annual sales in 2015.

CHALLENGES

Mars wanted to take advantage of the global market for meat products used in pet foods but did not have the space within their manufacturing plant to store large batch purchases of product.

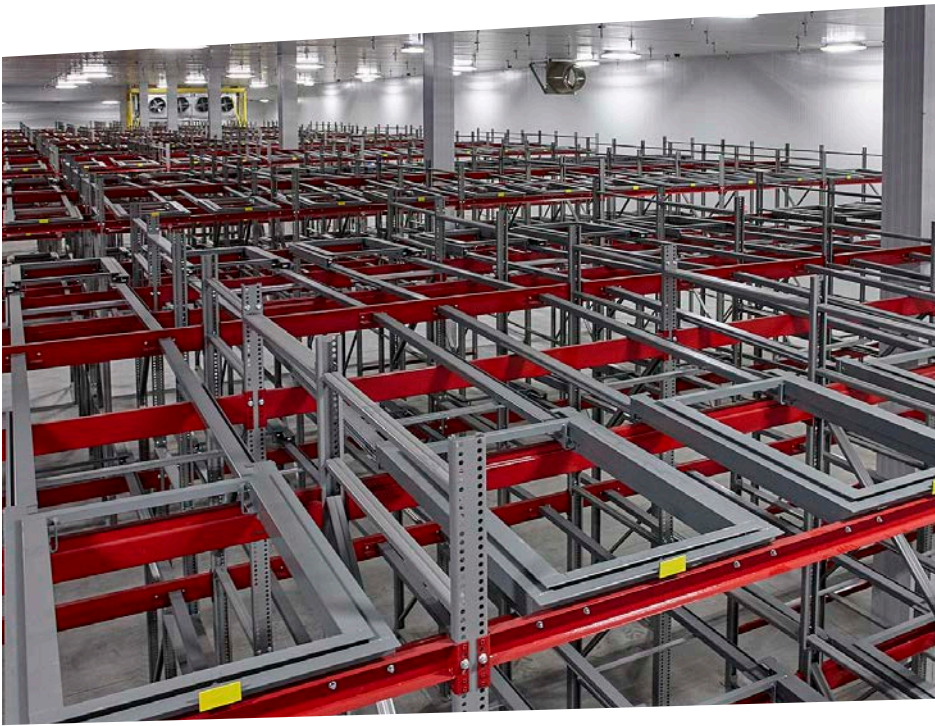
SOLUTION

In 2017 Mars purchased a vacant building to convert from ambient temperature warehouse into a freezer. A plan was developed that maximized storage while still ensuring enough selectivity to rotate product on a FIFO basis. The new facility has just over **18,000 pallet positions of 2, 3 and 4 deep pushback** situated in 154,000 square feet of a unique freezer within a building. The project was very cost effective because it utilized pushback over double stacked floor storage, ensuring high density without having to pay for carts, rails and beams on the bottom level.

PRODUCT SPECIFICATIONS

1,786 lanes of 3 deep and 866 lanes of 4 deep low-profile pushback, complete with linked carts, welded steel shafts and lane full indicators. Reinforced roll formed frames with structural steel bullnose protection and structural steel load beams

- Cost effective technique for freezer construction versus new build
- Triple the pick faces compared to drive-in rack
- On time and on budget completion



HOW DEEP CAN YOUR PUSHBACK RACKING GO?

We offer 2, 3, 4, 5, & 6 deep pushback for our standard low profile push back designs and for our heavy duty designs. For our special ladder style and full support/mesh covered designs we can go up to 5 deep.



WHAT SIZE OF AISLE DO I REQUIRE?

Aisles should be sufficient to allow an operator to square up to the pallet without turning into the pushback rack. Usually this is typically 6" more than the truck manufacturers minimum aisle requirement.



DOLLARAMA MONTREAL, CANADA

CLIENT

Dollarama is Canada's leading dollar store retailer with over 1,100 stores serviced by 3 existing distribution centers totaling 1,250,000 square feet.

CHALLENGES

Dollarama needed additional warehousing to meet the demands of new stores. They also had to develop a high density layout to ensure they could maximize the use of space.

SOLUTION

In 2016 Dollarama broke ground on a new state of the art 500,000 square foot distribution center.

Working in conjunction with a leading rack manufacturer in Montreal, over **53,000 pallet positions of 6 deep pushback** were installed in the new facility.

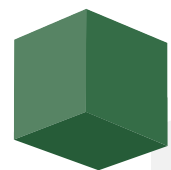
Dollarama has been a longtime user of 3D's low profile pushback, with the first installation dating back to 2003. Historically, Dollarama had used drive-in racking to store material. However, they were finding that "honeycombing" was leading to space utilization rates lower than 70%. By switching to pushback they were able to achieve a high density layout but also increase the utilization rate to over 90%. Since 2003 Dollarama replaced a number of the drive-in rack systems with pushback to increase their storage capacity.

PRODUCT SPECIFICATIONS

8,946 lanes of 3D's 6 deep low-profile pushback, complete with linked carts, welded steel shafts and lane full indicators.

Reinforced roll formed frames with structural steel bullnose protection and structural steel load beams

- Over 90% Occupancy rates
- 85% more storage density compared to standard selective rack
- Over 100,000 square feet saved versus drive-in rack





DO I NEED SPECIAL FORKLIFTS?

No. 3D offers pushback systems that are installed with counterbalance, reach, deep reach, swing reach, and even clamp trucks.

HOW MUCH SLOPE DO THE RAILS HAVE?

Pushback racking system utilizes a slope of $\frac{3}{8}$ " per foot, or just a little less than two degrees. For example, a standard 4 deep lane for 48" deep pallets would have 6" of slope. This slope ensures that empty carts will always return to the front of the lane if accidentally pushed back by the operator. In most cases the total slope is less than the lift clearance above the pallet at the load end, and therefore, does not affect the number of storage levels.



MEVOTECH

TORONTO, CANADA

CLIENT

Mevotech is an automotive aftermarket parts supplier.

CHALLENGES

Mevotech acquired two new buildings: a 307,000 square-foot raw materials facility and another 180,000 square-foot building for finished goods. 3D had to design a solution to accommodate 94,000 SKUs while trying to maximize storage density.

SOLUTION

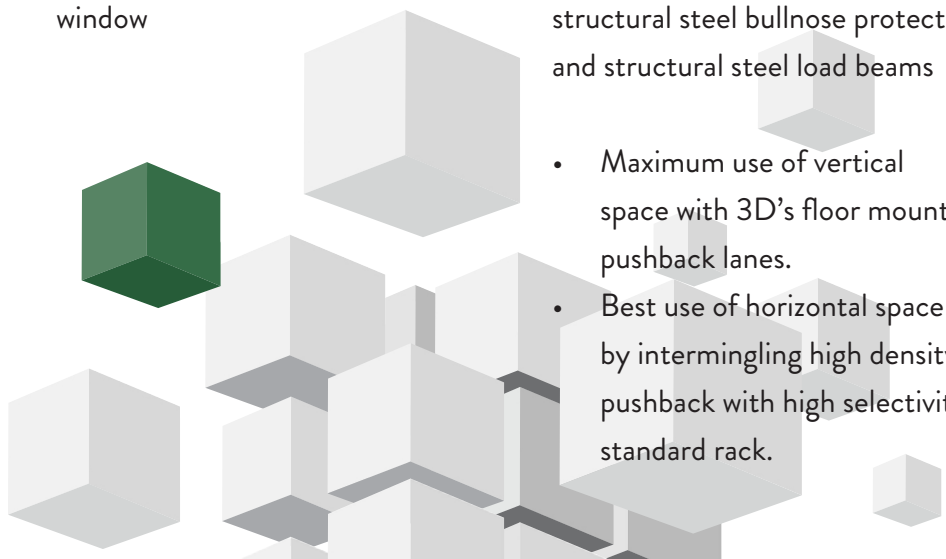
Using a combination of pushback, Pallet Flow and Selective Pallet Rack products, 3D was able to accommodate 94,000 SKUs in a 13 week production and installation window

PRODUCT SPECIFICATIONS

Over **1,200 lanes of 3 deep pushback** and **560 lanes of 5 deep pallet flow**.

Reinforced roll formed frames with structural steel bullnose protection and structural steel load beams

- Maximum use of vertical space with 3D's floor mounted pushback lanes.
- Best use of horizontal space by intermingling high density pushback with high selectivity standard rack.





HOW MUCH PUSH FORCE IS REQUIRED BY THE FORKLIFT?

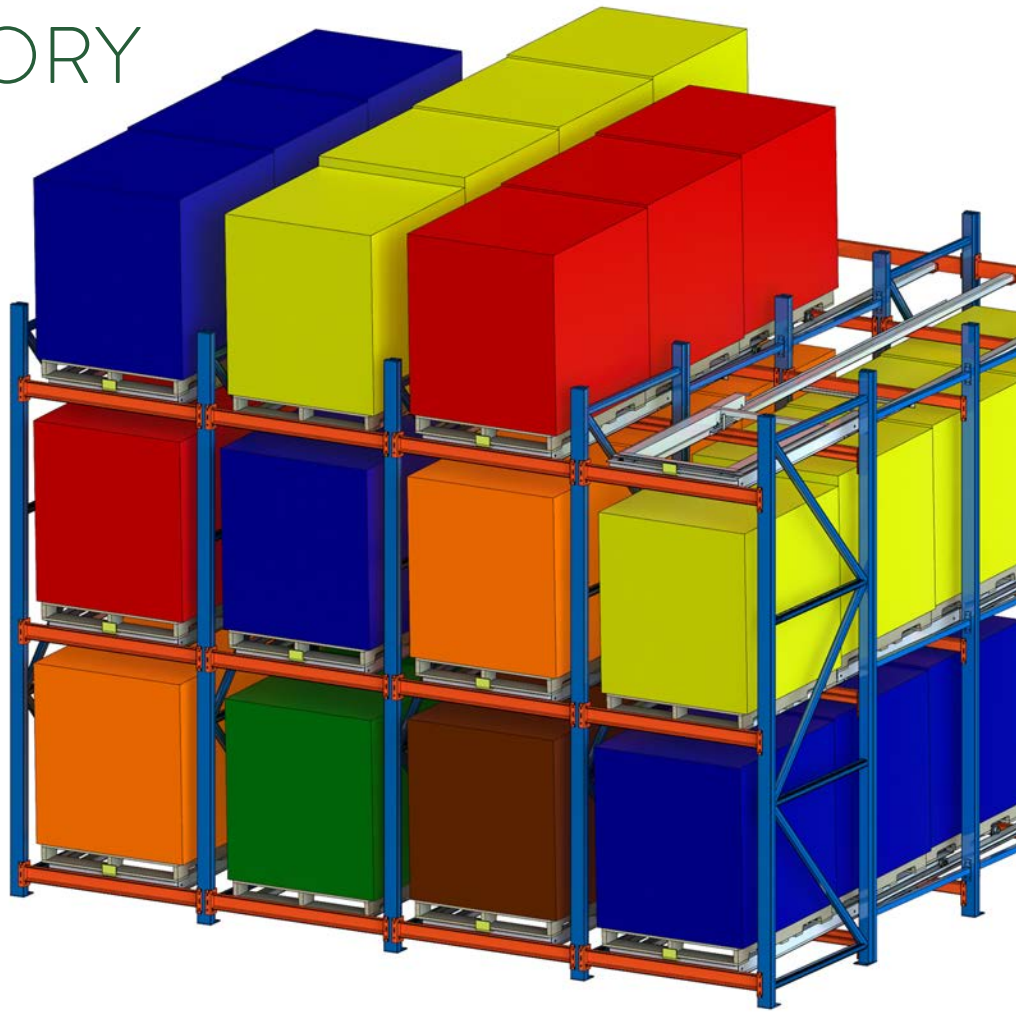
Approximately 4% of the total weight being pushed back, not counting the pallet on the forks of the truck. For example with 2,000 lb loads on a 6 deep it would require 400 lbs of force to load. This is well within the capabilities of most lift trucks. We have several installations of six deep in freezers with reach trucks.

We can also reduce the slope if you have a special requirement. Because our wheel rolls on a low friction tube compared to a rough C channel or I-beam, lower slope is not an issue.



FIFO INVENTORY ROTATION

In this example, to achieve FIFO we simply follow one simple rule: never put new product in front of old. When new “red” product comes in we will put it in a new lane, even if there is a part lane of old “red” available. That way we never bury old products behind new ones. When it is time to ship we pick from the oldest lane first. This simple method ensures FIFO.



KEYS TO SUCCESSFUL PUSHBACK APPLICATIONS

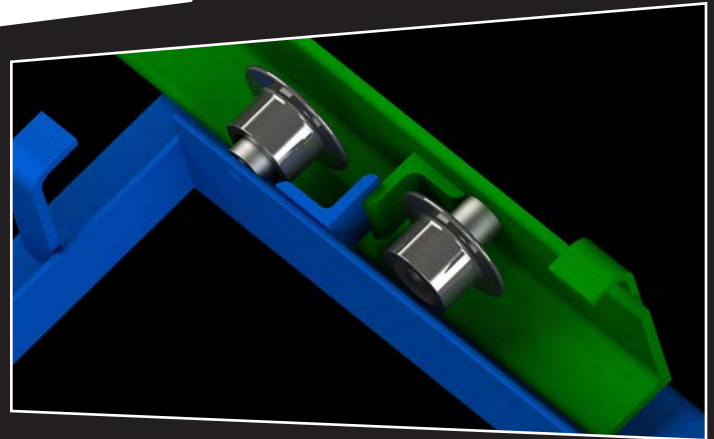
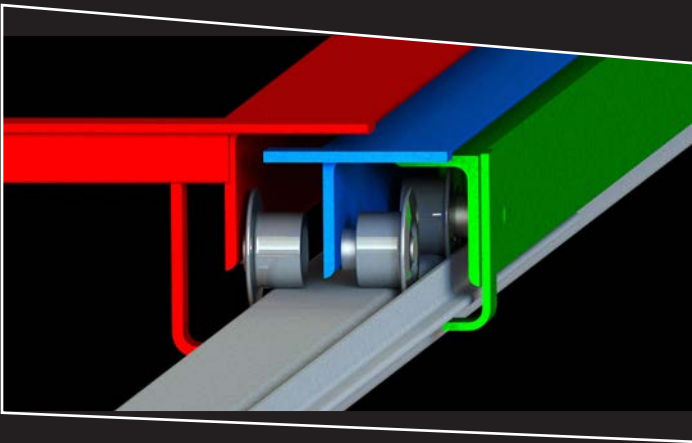
1. Select products to be stored that have at least 3 times the lane depth in average pallets in inventory
2. Never replenish a partially filled lane with a new lot code of the existing product or a different product
3. When retrieving loads for shipping or for use within the plant, be sure to pick from the oldest part lane first
4. Use random storage to minimize honeycombing, enabling you to maximize your storage facility



FEATURES & BENEFITS

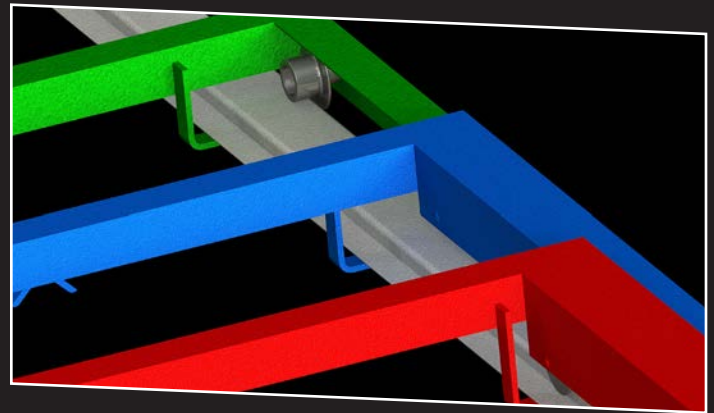
LINKED CARTS

- carts linked when extended
- eliminates single pallet hang-ups
- important safety feature no system should be without



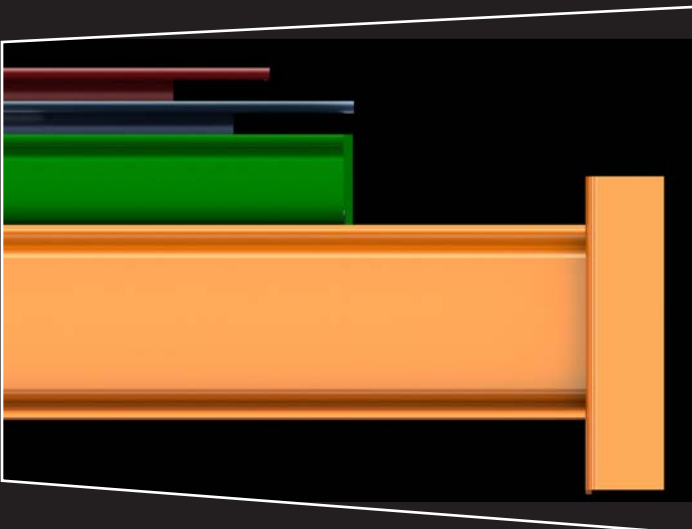
FLANGED STEEL WHEELS

- manufactured from solid steel
- equipped with heavy duty precision bearings
- oversized to withstand shock loading
- capacities of up to 1,400 lbs. per wheel
- welded steel shafts



LIFT-OUT PROTECTORS

- built-in safety feature
- prevents accidental dislodgement
- structural steel construction



LOW PROFILE

- lower profile than most of our competitors
- extra lift clearance
- enables possibility of extra level



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ABOUT 3D STORAGE SYSTEMS

3D has grown to become one of the largest producers of dynamic storage systems in North America. We manufacture pushback and flowrack systems in both our Georgia, USA and Ontario, Canada plants.

Our system solutions have been implemented in small warehouses and in large facilities exceeding one million square feet.