



DYNAMIC STORAGE PRODUCTS

STEADIFLO PUSHBACK STORAGE– Using your warehousing space to the maximum.

WHAT IS PUSHBACK RACKING?

Pushback racking is a pallet storage method that allows pallets to be stored from 2 to 6 deep on either side of an aisle, thereby giving you higher storage density than other forms of racking. A pushback rack system can double or triple your storage when compared to standard pallet rack or double deep racking systems.

HOW DOES PUSHBACK RACK WORK?

A pushback system contains a pair of inclined rails and a series of nesting carts which ride on these rails. As an example, a 4 deep lane will have 3 nested carts. The first pallet is loaded on the top cart by a forklift. When the operator comes in with the second pallet, he pushes the first pallet back and rests the second pallet on the middle cart. Similarly, the 3rd pallet pushes back the first 2 and rests on the bottom cart. The operator loads the last pallet by pushing back the first 3 and placing the load on the pair of rails.

When unloading, the sequence is reversed. Because the rails are inclined toward the aisle, when

the operator picks up the pallet resting on the rails and backs out, the 3 remaining pallets will follow to the front of the lane. He can then remove each pallet in succession, until the lane is empty.

WHO USES PUSHBACK?

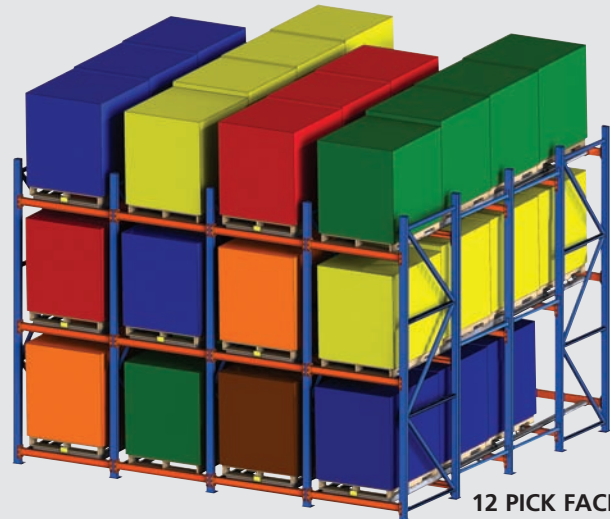
Our products are installed in a wide variety of industry types including food distribution, manufacturing, 3rd party logistic facilities, automotive and pharmaceuticals. Almost any warehouse that is looking to increase their storage capacity is a potential candidate for pushback rack. Pushback systems are fully operational in freezers or coolers and no special forklifts are required.

WHY USE PUSHBACK VERSUS DRIVE-IN RACK?

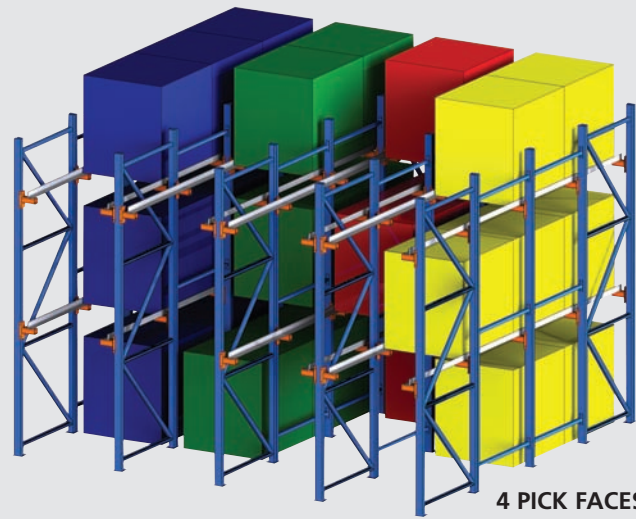
Because the pallets come to the aisle, pushback is much faster to load and unload than any comparable drive-in rack. Additionally, stock rotation and occupancy are greatly improved because each level can store a different product in pushback. Finally, rack damage is significantly reduced because the operator does not have to drive into the rack to remove pallets.

HOW DOES <i>Steadiflo Pushback</i> STACK-UP?	Floor Storage or Drive-in	Steadiflo
Typical occupancy	50-60%	85-95%
Handling costs	High	Low
Number of pick faces per tower	One	# Levels
Random storage all levels	No	Yes
Stock rotation	Rotate towers	Rotate lanes
Rack/Product damage	High	Low
Number of products applicable	Few	Many
Efficient bottom level case pick	No	Yes

PUSHBACK ACCESSIBILITY– All 12 lanes and pallets are accessible from the aisle...ALL THE TIME!



Steadiflo Pushback **90%** Utilization of pallet positions

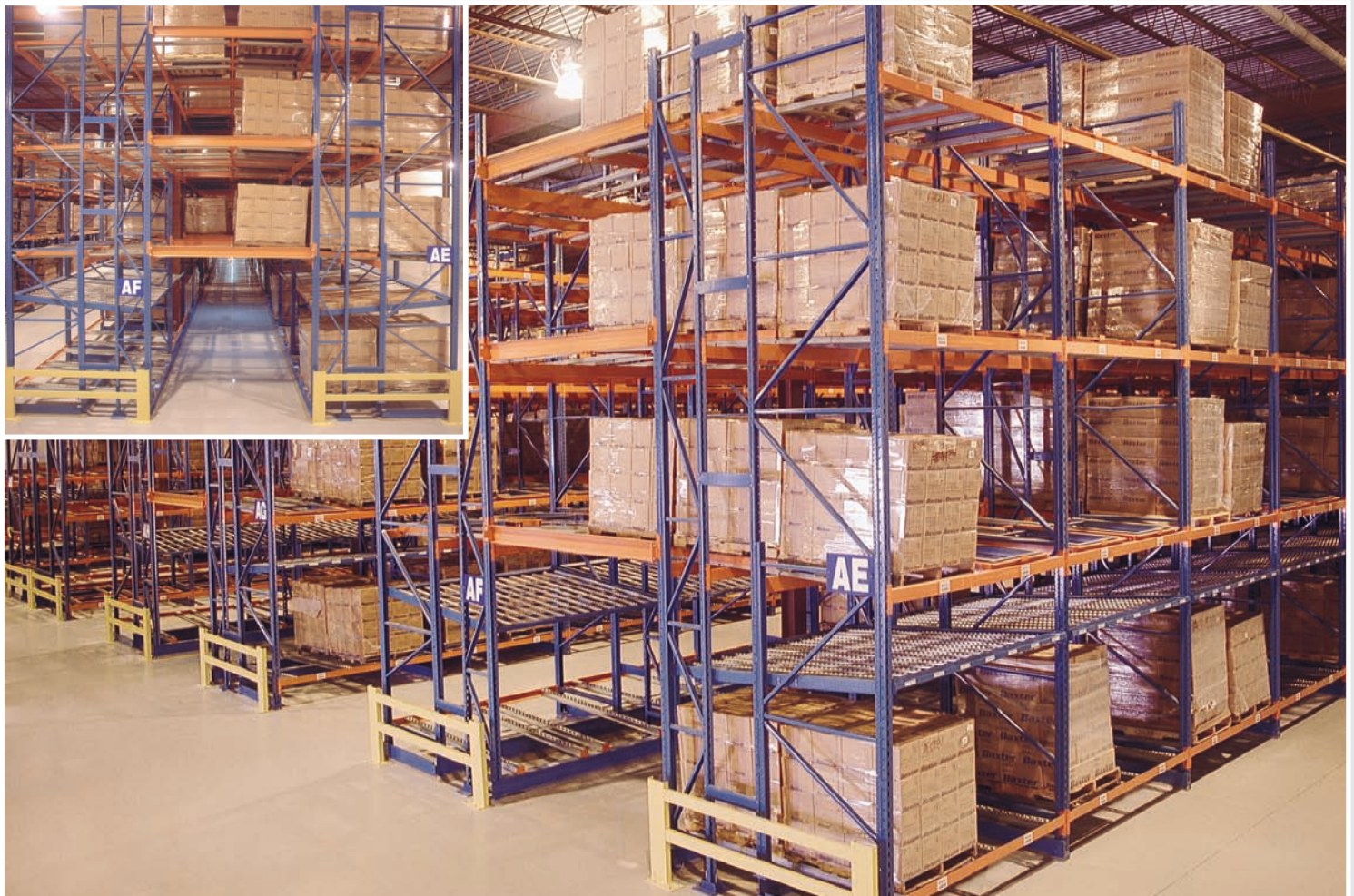


Drive-in Honeycomb **60%** Utilization of pallet positions



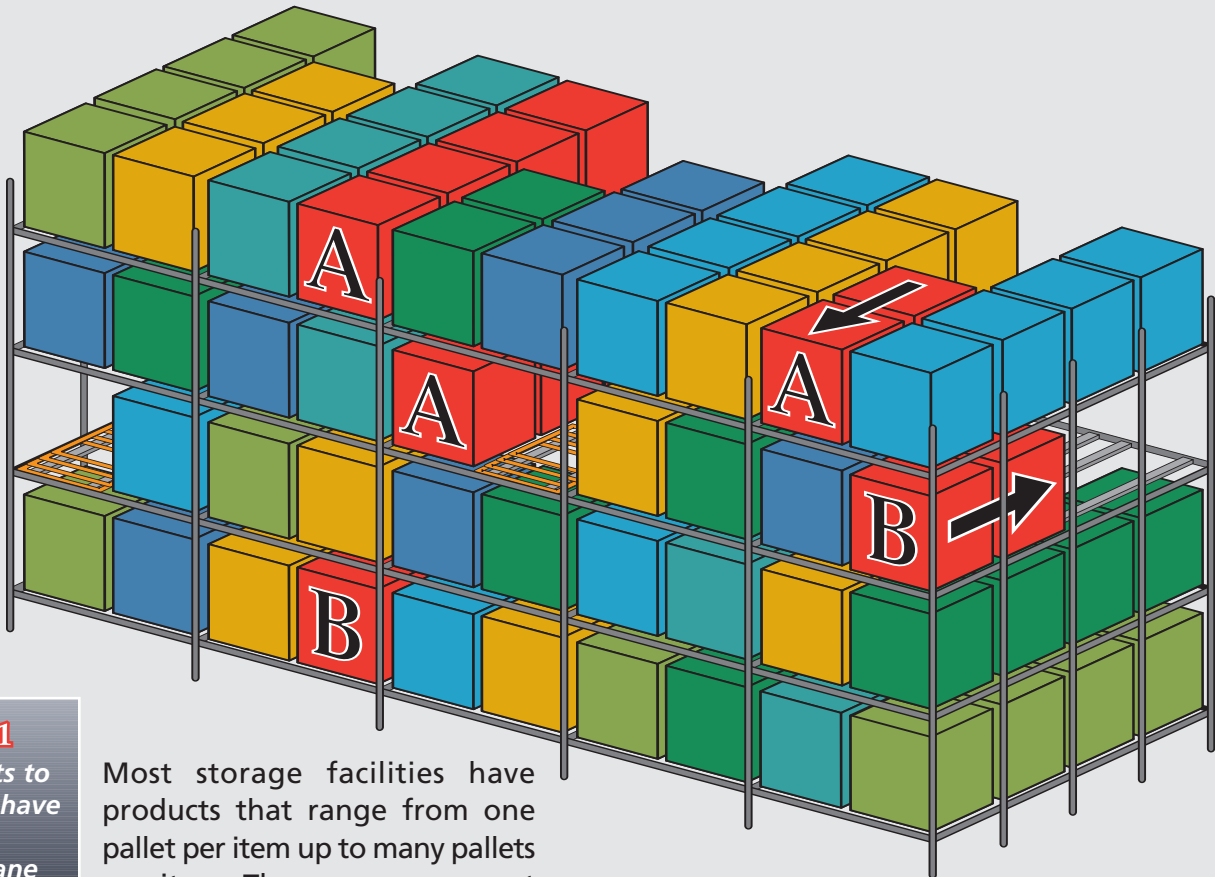
▲ 4-deep, 5-high pushback application in freezer

▲ Floor storage with pushback above



▲ First level – flowrack / Second level – carton flow / Above – pushback

KEYS TO SUCCESSFUL PUSHBACK APPLICATIONS



RULE #1

Select products to be stored that have at least 3 times the lane depth in average pallets in inventory

Most storage facilities have products that range from one pallet per item up to many pallets per item. The average amount of storage per item should be used to select optimum lane length. Table shown will yield

occupancy rates of 80% – 90%. The higher the number of lanes per product the higher the occupancy rate.

PALLETS PER PRODUCT	LANE DEPTH
1 – 4	STANDARD RACK
5 – 8	2 DEEP PUSHBACK
9 – 12	2 – 3 DEEP PUSHBACK
13 – 16	3 – 4 DEEP PUSHBACK
17 – 20	4 – 5 DEEP PUSHBACK
OVER 20	5 – 6 DEEP PUSHBACK

RULE #2

Never replenish a partially filled lane with a new lot code of the existing product or a different product

As a result of rule number 1 there is a minimum of three to five lanes available for any one product. Therefore, when a new lot code is introduced, a new lane (as depicted in Red B) is selected so as to not block access to an existing lot code (as depicted in Red A).

RULE #3

When retrieving loads for shipping or for use within the company, be sure to pick from the oldest part lane first

Picking from the oldest part lane, (as shown in Red A) will automatically rotate your stock while freeing up empty lanes for general availability. This will result in no more than one part lane, per lot code and will

ensure FIFO stock rotation (First in – First Out).

RULE #4

Use random storage to minimize honeycombing. This will enable you to maximize your storage facility

Random storage in any of the lanes that become available will allow the storage requirement for any item to grow and shrink as necessary. Fixed locations would require storage to be preset for every item at its peak.

Exceptions could be made for bottom level case picking with fixed locations.



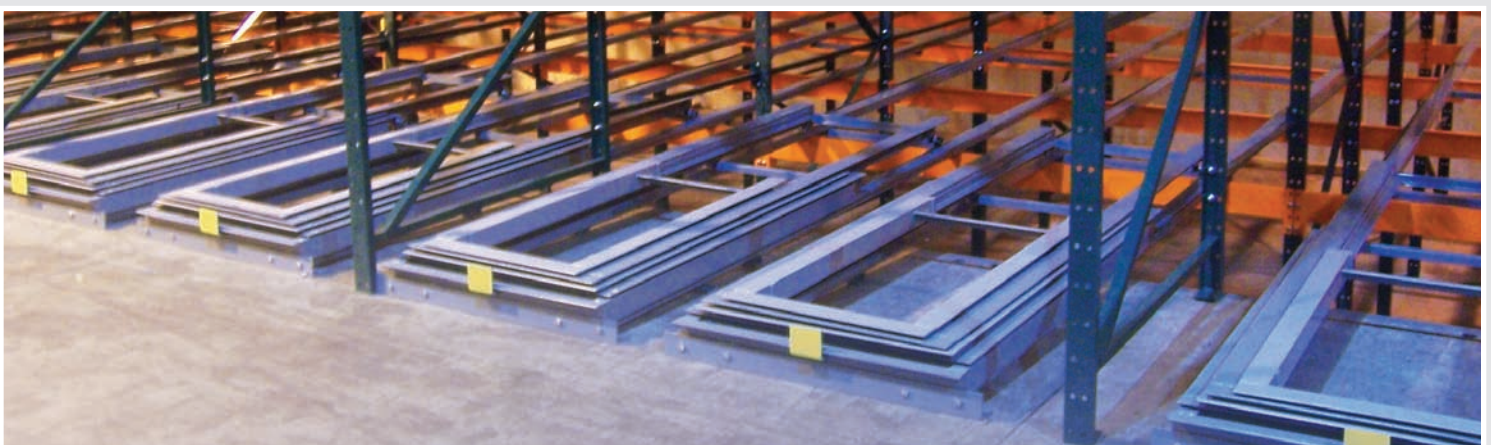
▲ 5-deep back-to-back pushback



▲ Pushback with end capping standard rack

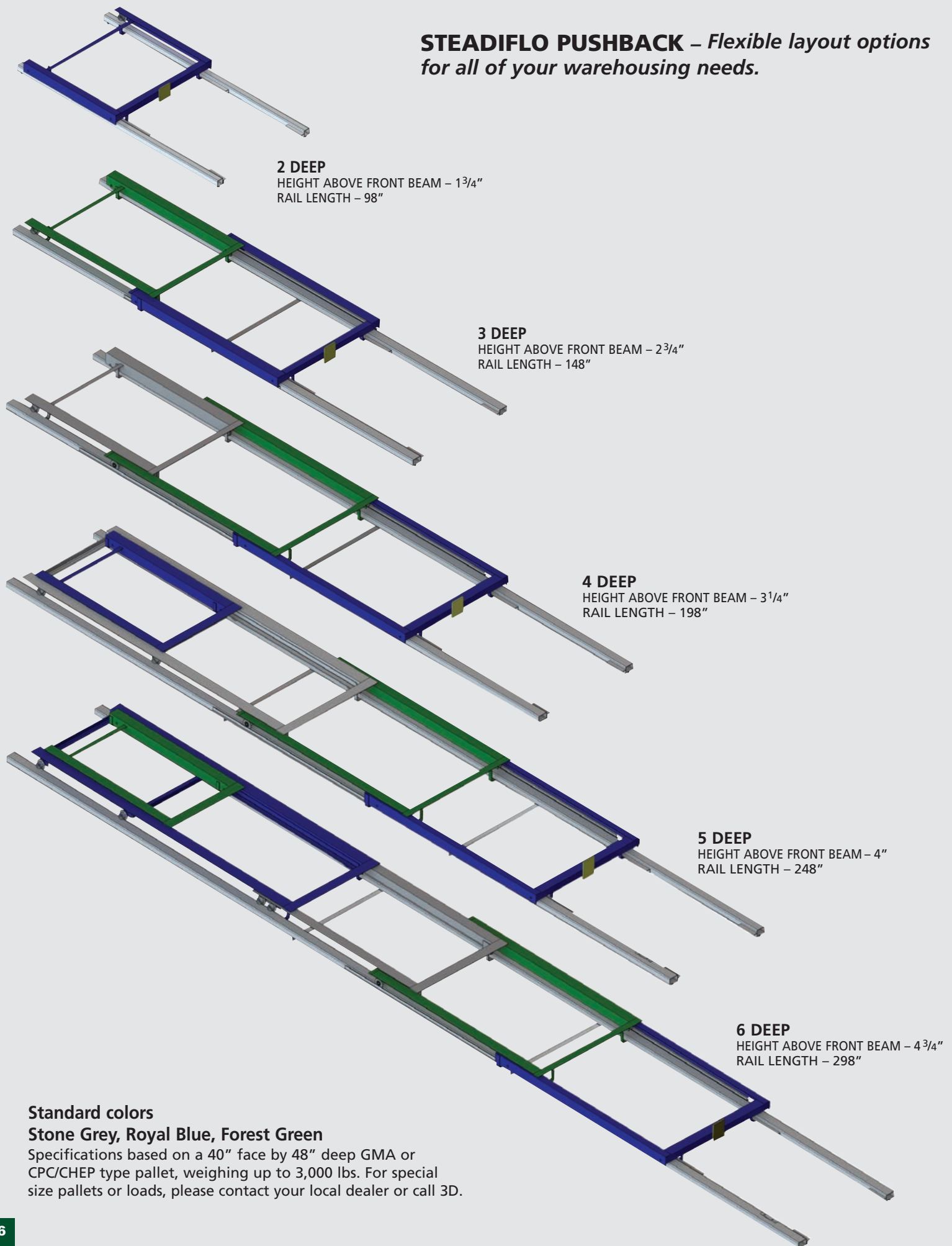


▲ Level pushback carts for special applications



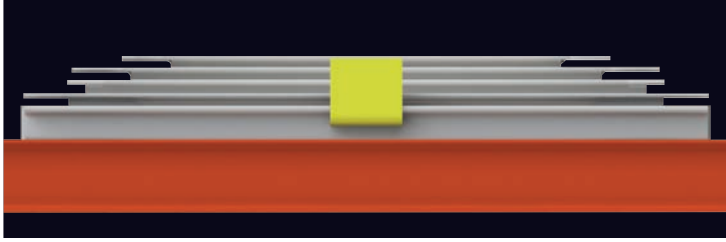
▲ 6-deep pushback, floor mounted to fill in an unused trainwell

STEADIFLO PUSHBACK – Flexible layout options for all of your warehousing needs.

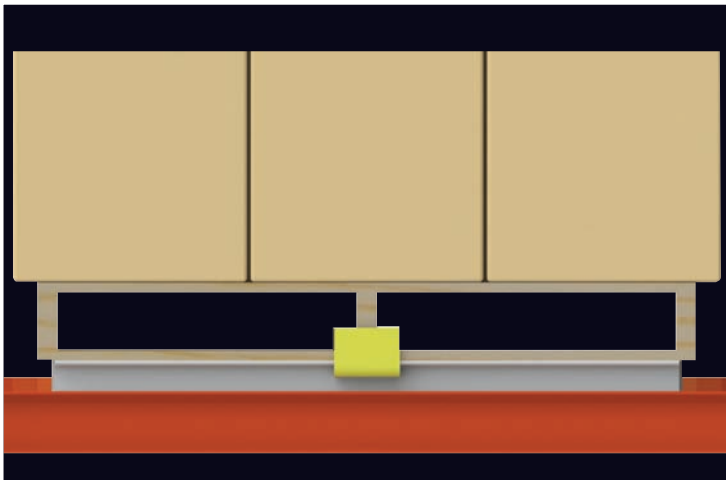


STEADIFLO PUSHBACK – Features and Benefits.

3D Storage Systems uses a unique design that provides trouble free operation as well as extensive built-in safety features. Structural steel construction ensures long life in tough warehouse environments.



LOW PROFILE – *Steadiflo* has a lower profile than other cart type systems. This allows for extra lift clearance and may even mean the difference of an extra level.



MULTI PURPOSE PLATE / SAFETY STOP

Height Gauge – When loading a pallet, the operator knows that if the load is high enough to clear the safety stop, then the pallet will not prematurely move the awaiting cart.

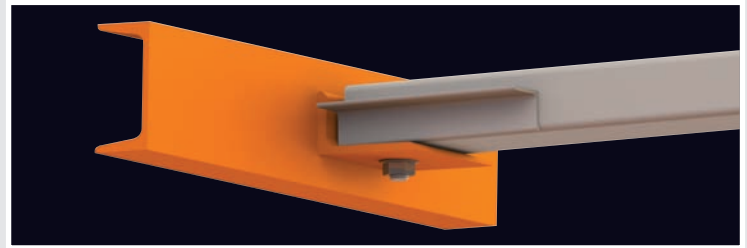
Strip-Off Stop – If, after placing a pallet, the operator has his forks in an improper tilt position, the safety stop will catch the bottom of the pallet and “strip” it off his forks.

End Stop – The safety stop, which is situated on the lowest cart and protrudes $\frac{3}{4}$ ” above the highest cart, prevents pallets from shifting beyond the front load beam.

Push Plate – Pushing on the plate with the last pallet being inserted into the lane ensures proper placement on the rails.

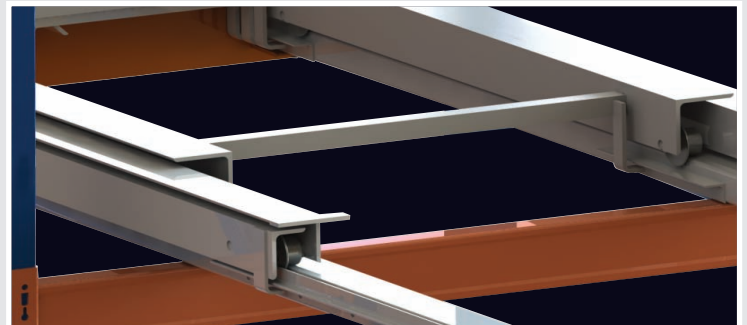
Lane Full Indicator – The operator can tell if a lane is full by the absence of the safety stop. If it is not showing at the front, the last cart has been loaded and there is a pallet on the rails – a full lane.

LINKED CARTS – Carts are linked when extended, eliminating the possibility of single pallet hang-ups. Without this feature, it would be possible for a pallet to become temporarily lodged at the back of a lane, release, and travel in an uncontrolled manner to the load end. The result, potential for damage to product and personal injury.

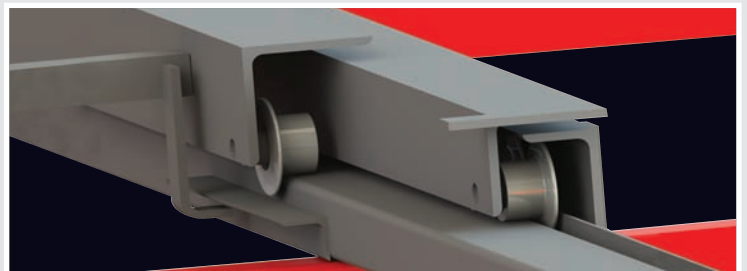


SIMPLE DESIGN AND EASE OF INSTALLATION

The Steadiflo design allows for easy installation with the wheels pre-installed at the factory and simple drop-in rail design that requires rack attachment at the front and rear only.



LIFT-OUT PROTECTORS – Each cart is equipped with lift-out protectors, which prevent accidental dislodgement of a cart by the fork lift operator.



FLANGED STEEL WHEELS – Wheels are manufactured using solid steel and are equipped with heavy duty bearings. Sturdy $\frac{5}{8}$ ” shafts are welded to the carts and are oversized to withstand shock loads of up to 1,400 lbs. per wheel.

PALLET FLOW



▲ Deep lane pallet flow with wheels in a single-double-single configuration for standard GMA/CHEP pallets



▲ Roller flowrack for special pallets and loads

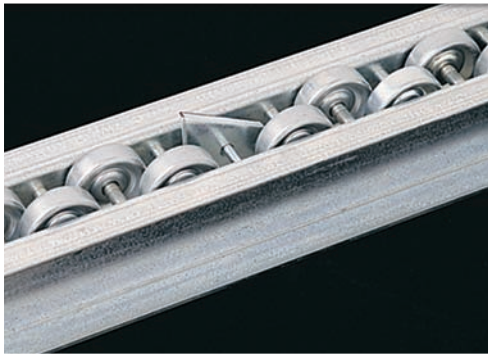


▲ Skatewheel being used for pallet picking and return



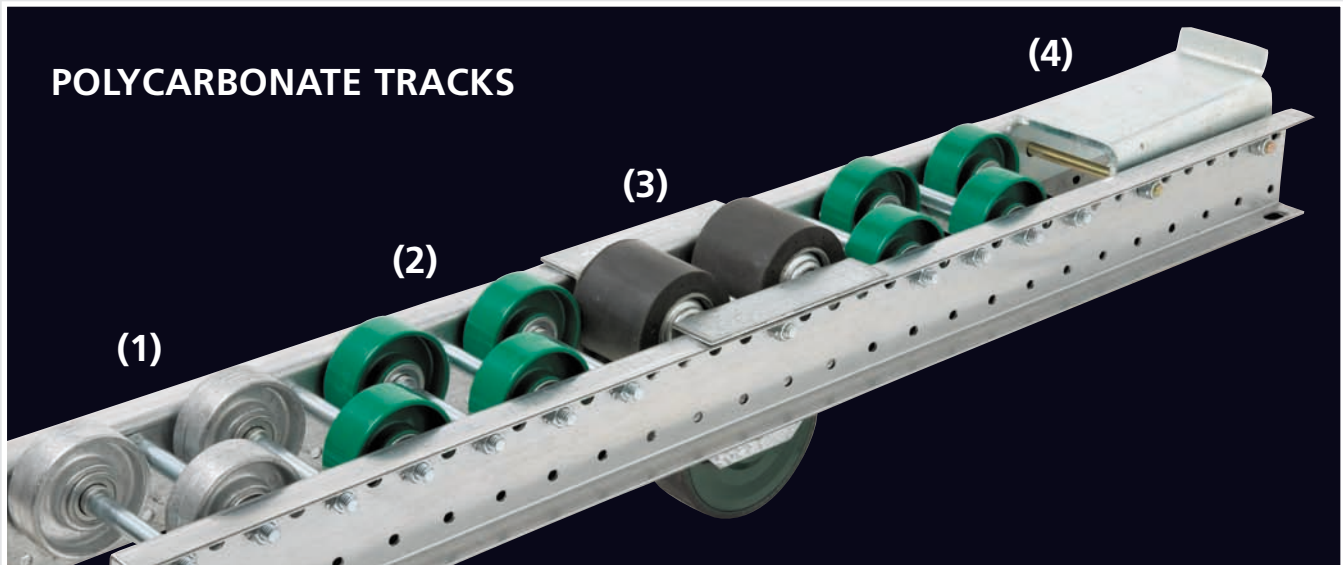
▲ Heavy duty deep lane pallet flow with wheels in three double row configurations

COMPONENTS FOR EVERY FLOW STORAGE APPLICATION



SKATEWHEEL TRACKS – Typically used in two or three deep picking systems either in single runs or double staggered runs as shown here. The steel wheels are constructed of 15 gauge material and are load-rated at 150 pounds. Wheels are mounted at 1½" centers when double staggered, and 2" or greater when used in single lines. Channel supports are constructed of 1"x 3"x 1" 12 gauge galvanized steel channel. Ramp stops and anti-rollback devices are standard.

STEEL ROLLERS – Rollers range in size from 1.9" to 2.5" in diameter and 4" to 56" BFR (between frame rails). Rollers ensure stability as well as providing large load bearing capacity and support for special pallets, steel containers or plastic totes. Channel supports are constructed of 1" x 3" x 1" 12 gauge or 1.5" x 4" x 1.5" 10 gauge galvanized steel channel depending on the application.



(1) IMPACT WHEELS – Cast zinc impact wheels are typically placed in the first 12" of the lane to provide superior resistance to damage from pallet impact.

(2) POLYCARBONATE WHEELS – These 2.875" diameter wheels have steel ball bearings and are typically configured on 2" or 3" centers. Wheels are load-rated at 150 pounds. These wheels are most commonly used for GMA or CHEP pallets and are generally mounted in a three track configuration with the center track containing speed controllers. The special polycarbonate formula is suited to wide temperature ranges and is resistant to impact.

(3) INDIRECT MOUNTED BRAKES – Our indirect brakes provide a superior braking surface with increased friction, using two rubber coated contact rollers.

(4) PALLET STOPS – Our stops are constructed from structural steel, enabling them to withstand impacts from heavy pallets and forklift abuse. The stops are manufactured with a gentle ramp slope that brings the loaded pallet to a stop in a smooth and controlled manner.

CARTON FLOW, CARTON PUSHBACK, TOTE STORAGE

OUR HEAVY DUTY CARTON FLOW SKATEWHEEL BEDS OFFER:

- Reduced pick paths
- Enhanced FIFO
- Increased pick slot locations
- Improved picking efficiencies
- Retrofitting of existing rack



FEATURES AND BENEFITS:

- Superior abuse resistance, virtually impossible to damage
- Carton size and weight flexibility, eliminates the need to re-profile
- Smooth flowing ball bearinged steel wheels means less slope required
- Optional plastic wheels available for lighter product/load applications
- Welded one piece frame, powder coated tough for long lasting life
- Highly durable 1/4" diameter steel shafts – provides impact resistance
- An impressive overall load rating of 50 lb. per square foot
- Heavy duty wire dividers aid in product separation and flow control



▲ Full wheel bed with plastic wheels



▲ Carton pushback with pallet picking below



▲ Carton Flow with lane dividers



▲ Carton flow with tilt shelf



▲ Multi-level Carton Flow showing full width bed using plastic wheels



**STORAGE SYSTEMS
LIMITED**

TELEPHONE (905) 830-0003 FAX (905) 830-0338
WWW.3DSTORAGESYSTEMS.COM