

Pallet Flow Installation Guidelines

A quality dynamic storage system relies on five critical items:

1. Proper application of rail type
2. Consistent quality pallets of the specified design.
3. Quality rack structure designed to accommodate the rail and the load.
4. Accurate and proper installation.
5. Good System Maintenance.

These instructions will address “Accurate and proper installation”. The following tolerances are Absolutely Critical for good gravity flow results. These tolerances should be specified at the project development stage, included in the documentation for the installation pricing stage, included in the labor contract, reviewed at installation start up, and checked upon completion, prior to system sign off. We recommend the use of a transit or laser level to achieve these results.:

1. Rail must be installed at the specified slope for the application. The most common pitch used are 3/8” and 7/16” per foot, however refer to system drawings for the specific pitch or call Mallard for confirmation. The sloped must not deviate from a true pitch line by more than 1/16”.
2. Beams supporting the rail must be adjusted or shimmed so that rails within a lane do not deviate from level by more than 1/16”.
3. Rails must be installed so that from front to rear of the system, the rail does not deviate from a true line by more than 1/16”.

The end result is a flow lane in which the top of the wheels or rollers are sloped properly, and in a true plane.

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To maintain these tolerances, we recommend the following mounting details.:

1. All rails must be attached to the rack at every support beam, using a technique that prevents the rail from shifting or becoming detached during normal everyday use.
2. Rack frames must be securely anchored using a technique that prevents shifting in any direction which will result in out of alignment rail.
3. Rails should be protected from forklift impact, which will result in out of alignment fail and component damage, thus affecting good flow characteristics. The most common method is to design and manufacture the load end and unload end beams in a manner in which the rail is hidden behind the beam and cannot be directly impacted by the forks.

Following are a couple of general installation practices you may want to follow to assure the system will perform as expected:

1. Install and fully test one complete lane prior to moving forward. Have the person responsible for system acceptance sign off on this first lane. Installation can then be carried on with confidence.
2. As bays within a system are completed, assuming space allows, test each lane for proper flow. This “test as you go” method allows the crew to depart shortly after completion and test of the final bay, improving crew scheduling, and help reduce or eliminate the need for return “adjustment” trips. Testing is customarily performed by the person responsible for the system acceptance and sign off, however responsibility for this testing function should be clarified up front.

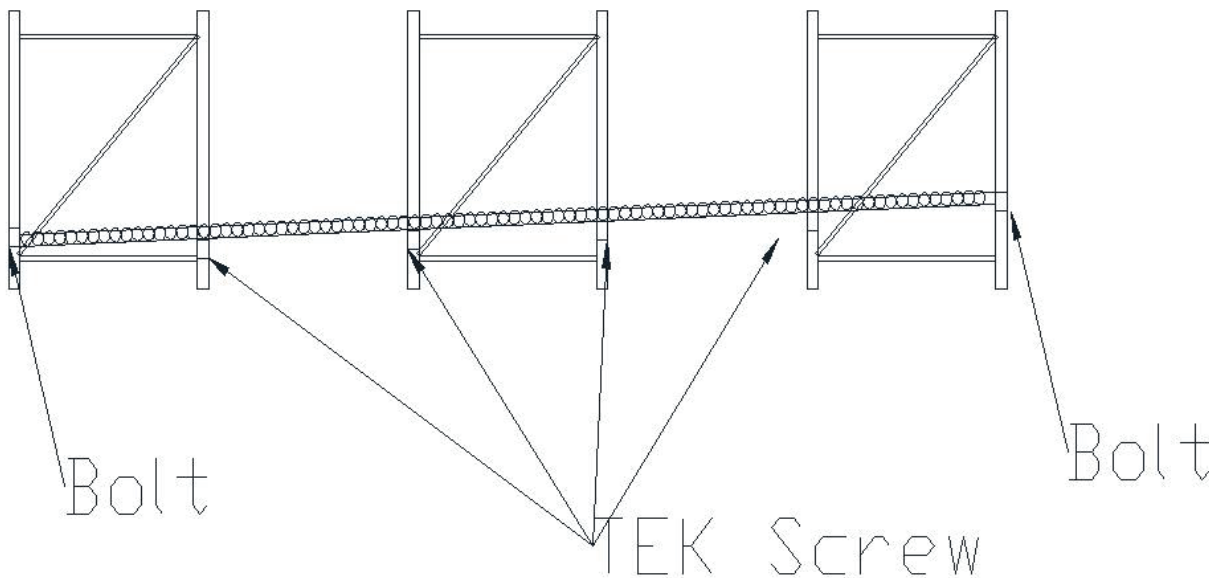


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Installing the System:

- Rack must be leveled, shimmed and securely anchored to ensure that all flow support beams are level and there elevations do not deviate from a true pitch line by more than $\pm 1/16"$.
- Maximum allowable deflection of pallet is $1/8"$.
- Bolt flanges at each end of lane to structurally sound angle designed to carry the load and the impact of Loading/Unloading by forklift trucks.
- Tek screw balance of tracks to intermediate beams to maintain the necessary track alignments and prevent the rails from shifting.



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Operation:

1. Pallets must be loaded and unloaded with the forklift squared up to the face of the rack-do not approach or withdraw at an angle.
2. When loading a Flow lane the pallet must be level and two to three inches above the wheels or rollers, a true line by more than 1/16".
3. Position pallet into lane and slowly lower and tilt the pallet down on to the wheel/roller, ensuring the front of the pallet is flush with the front beam, until contact is made.
4. Position the second pallet by following the first procedure until the lane is fully loaded.
5. When removing pallets from a lane, lift the pallet to a level position just high enough to clear the front beam. Withdraw at a slow constant speed.
6. Make sure the following pallet comes to the front of the system. If for some reason the pallet is stuck and does not roll forward during the unloading, push the pallet back in then pack out again (also known as "plugging". If the pallet is still stuck, reload the lane and do not unload until the cause of the jam has been found and removed.

Maintenance Procedures:

Safety

- Your Flow Storage System is designed so that personnel do not have to enter the rack to operate the system. If a pallet becomes stuck in a lane and does not flow forward, an initial attempt should be made to free it without entering the rack. This can usually be accomplished by loading another pallet behind the stuck one. The additional line pressure is often enough to free the jam.
- If it becomes absolutely necessary to enter the rack for any reason, the following procedure should be used:
 - Remove all pallets from lane
 - If climbing into the rack structure, always wear approved safety harness and attach to safety cable in lanes on the second level or above.
 - Use "buddy" system; having someone stand at exit end of lanes ensuring that no loads are removed from system in lanes adjacent to that being worked in.