



Pallet Rack Damage

No matter how well your storage system is designed and your drivers trained, collisions between your forklift trucks, their loads and your storage racks are inevitable. We encourage our customers to regularly inspect their rack for damage, have a formal rack inspection carried out by an expert at least once a year and to motivate their fork lift truck drivers to report damage.

However, rack damage will occur and need rectifying. Any damage to a rack upright will reduce its load carrying capacity. The greater the damage the greater the reduction in its strength until the upright collapses at its normal working load. Damage to bracing sections will reduce the capacity of the racking frames to withstand frontal impacts and may reduce the axial load carrying capacity of frame uprights.

STORAGE RACK CODE REQUIREMENTS FOR DAMAGED RACKS:

Damage to a rack frame or beam will reduce its load capacity. The greater the damage, the greater the reduction in the load carrying capacity. Damage to the frame bracing will reduce the capacity of the frame to withstand accidental impact to the front post and will also reduce the axial load carrying capacity of the frame. Damage to the beam/frame connection will reduce the load capacity of the beam.

There are two main Safety Codes that apply to the design, installation and maintenance of steel storage rack structures.

- (a) Rack Manufacturer's Institute (RMI) – Specification for the design, testing and utilization of industrial steel storage racks.
- (b) SEMA Code of Practice for the design of static racking

The RMI Code states that “Upon any visible damage, the pertinent portions of the rack shall be unloaded immediately by the user and the damaged portion shall be adequately repaired or replaced”.

The SEMA specification allows for measurable amount of damage and provides a method of measuring the damage.

To reduce the possibility of a collapse occurring through damaged members, we suggest following the SEMA method of measuring the damage. This will enable you to assess how serious the damage is.

Damage to uprights and bracing members:

1. Any upright with a tear, split or buckle should be replaced.
2. An upright with a bend in the direction of the rack beam should be measured using a straight edge 1.0 metres long. Placed against the concave edge, the gap between the edge and the rack at the bend should not exceed 5.00mm. See the illustration below.
3. For an upright bent in the plane of the frame bracing the maximum gap between the upright and the straight edge should not exceed 3.0mm. See the illustration.
4. For an upright with damage in both directions deformation should be measured as above and the appropriate limits observed.
5. For bracing members bent in either plane the gap between the straight edge and the member should not exceed 10mm.



Where the measured deformations exceed the tolerances the damaged members should be unloaded and the system supplier consulted. In 90% of all cases damage to racking frames is restricted to the first 1000mm of the front upright.

Damage to beams:

1. Beams showing signs of cracks in the welds between the end connector and beam section should be replaced.
2. Beams with end connectors showing deformation should be unloaded and the suppliers' expert opinion sought.
3. Beams naturally deflect under normal loading. This deflection should disappear when the beams are unloaded. If it does not then it should be measured. If the beam's residual vertical deformation exceeds one thousandth of the span length then your system supplier should be consulted. Lateral deformation should not exceed 40% of the normal vertical deflection under load.

As already stated any rack damage will reduce the load carrying capacity of the system. If you have a damaged component then using these guidelines will enable you to assess the severity of the damage. Maintaining the safety margins of your storage system is critical.