

Rack Safety: Why Is It Important?

Risks of Ignoring Damage

Pallet rack systems which are properly designed, manufactured, installed, used and maintained, can provide years of trouble-free, safe service. When properly used by careful, well trained fork lift operators, rack should need little maintenance or repair.

When racks are damaged or improperly repaired, the load-carrying capacity of the structure may be reduced. Although a single instance of damage to the rack may not result in failure, severe or accumulated damage will reduce the capacity of the system and may ultimately lead to its collapse.

The cost of rack collapses may far exceed the value of the entire rack structure and may lead to:

- Injury or loss of life
- Loss of product
- Loss of business and business interruption
- Large cleanup and replacement expenses
- Costly litigation

As the cases in Table 1 show, inattention to rack safety or improper rack repair may result in the rack's failure or collapse resulting in injury or possible death

	Summary of Accident	Cause of Accident
1.	<ul style="list-style-type: none">• Location: A food industry company warehouse.• Consequences: A worker was fatally injured.• Summary: A temporary pallet rack collapsed, and the loads fell on the worker seated next to the pallet rack	<ul style="list-style-type: none">• Failure of a pallet rack upright frame following repair work involving the butt welding of two portions of a column.• The supplier did not establish any inspection procedure for the rack components before it was delivered and installed at the customer's premises.• Inadequate repair method that failed to take into account the quality of the steel used and the racking manufacturer's recommendations.• Impact between the lift truck and the pallet rack.
2.	<ul style="list-style-type: none">• Location: The warehouse of a food industry wholesaler.• Consequences: A worker was fatally injured.• Summary: A pallet rack collapsed following an indirect impact between the lift truck and an upright frame column.	<ul style="list-style-type: none">• An unprotected upright frame column was struck by a hand-operated truck that encroached on the main aisle. This rack was struck by the lift truck driven by the worker."

Table 1

Examples of rack system collapses resulting from improper maintenance are shown below:



Rack damage was ignored



Rack collapse led to surrounding building's collapse

Rack damage may not be noticed or may be ignored because the rack structure continues to be standing. Examples of damaged rack are shown below:



Missing Diagonal



Sheared Anchor
Footplate Separated From
Column



Damaged Upright Column



Damaged column with
home-grown repair



Damaged Beam



Damaged Upright

In each of these examples, the damaged rack systems should be assessed and repaired or replaced, as directed by a qualified rack engineer.

Attempts to repair racks are often made without appropriate engineering oversight because “we have always done this” or “he is a good welder”. Without proper engineering oversight, there is no proof or assurance that the repair is sound and will yield a safe operating system.



Unsafe Field Welding Repair



Unsafe Field Column Repair



Defective Field Welding



Unsafe Field Bracing Repair

In these instances, the person who made the repair improvised, but a qualified engineer reviewing it recognized that the repairs had not been properly designed and had created a potentially unsafe condition. The improper repairs were removed and replaced with appropriate engineered solutions.