

**Loss Control Bulletin #44**

Storage racks are essential in just about every place of business. They are indispensable because they create efficiency in storing merchandise, operating supplies, and other business essentials. Storage racks are available to permit storage of materials of nearly any weight or shape.

Many injuries that occur while working from or near storage racks tend to be serious and costly for employers. Injuries typically include back injuries from lifting, falls from raised platforms, and being struck by falling objects, forklift trucks, or other powered material handling equipment. Investing time in planning and designing storage arrangements can significantly reduce the potential for such injuries.

**Designing Storage Areas**

When a new facility is in the designing phase, management has a unique opportunity to optimize the layout of storage areas for safety and efficiency. In such cases, seeking professional advice is desirable to assure that storage plans factor in both safety and efficiency. Designing for safety and efficiency can result in increased productivity, fewer worker injuries, and reduction in damaged merchandise.

The most basic considerations in designing storage derive from just three factors: stored material characteristics, space limitations, and material handling requirements. All other design considerations originate from these factors.

**Storage Rack Set-Up**

Storage racks need to be designed and set up to safely support loads they are expected to carry. The storage racks must also be sturdy enough to survive earth-

quake motion and hold up reasonably well to the rigors of contact with forklift trucks and other mechanized equipment. When the shape, weight, and size of equipment and materials to be stored are considered, the design specifications for needed storage arrangements become apparent. In order for storage racks to perform adequately under these conditions, their design and erection must include:

- Structural engineering designed to safely support the loads the racks will carry,
- Engineered earthquake bracing, including wall ties and floor anchoring,
- Steel ties to maintain spacing of back to back racks,
- Special design and erection to accommodate special shaped items such as steel tubing, drum storage, etc.,
- Set-back front posts to protect upright frame posts from forklift damage,
- Frame corner guards to protect from forklift damage,
- Safety netting,
- Ease of assembly and adjustable configuration,
- Adequate access area provided for material moving equipment,
- Where aisle space is limited, use specially designed vehicles for narrow aisles.

**Safety Considerations**

Non-structural safety considerations are equally important in protecting workers near storage racks. These include:

- Clear marking and enforcement of pedestrian and motorized equipment traffic patterns throughout the plant.
- Maintenance of a safety zone between pedestrian traffic walkways, storage rack areas particularly the backsides

of storage racks, and motorized material moving equipment traffic.

- Installing convex mirrors at blind intersections to help avoid collisions.
- Providing appropriate training to all employees who operate forklift trucks and other material moving equipment.<sup>1</sup>
- Store pallets that are frequently used in ergonomically desirable rack locations.

**Storage Tips**

Injuries associated with rack storage are sometimes due to unsafe stacking but more frequently due to poor storage planning. Back and shoulder injuries often occur because employees are required to overreach for items stored too high, too low, or too far back into the rack. Many of these injuries are preventable by following some basic safety rules.

**To prevent stored material from falling onto employees:**

- Install safety netting along the backs of single row racks to protect pedestrians from falling packages.
- When possible use shrink-wrapping on loosely palletized items stored on upper rack shelving.
- Make sure pallets are stacked properly and packaging is not damaged or deformed.

**To help prevent back and shoulder injuries:**

- Store frequently accessed materials so as to minimize reaching above shoulder height.
- Provide pick sticks for retrieving small lightweight materials stored on upper racks.

The guidelines provided in this bulletin are only intended to provide an overview of some of the more important steps that can be taken by management to establish a safe workplace. The guidelines are not considered exhaustive of all measures and controls that can be implemented by management to address all potential loss or injury producing causes. Ultimately it is the responsibility of management to take the necessary steps to provide for employee and customer safety.

---

**Loss Control Bulletin #44**

- Use set-low beams to raise the bottom level of rack storage to reduce the need to bend.
- Provide palletizers that adjust the height of the pallet as weight is added or removed.
- Install roller and channel devices (such as pallet flow) that permit easier access to loads and reduce the need for reaching.
- Provide vacuum hoists to help lift and transfer materials onto pallets.
- Provide rolling ladder platforms to provide safe access to high storage.
- Widen storage slots to allow easy access.
- Eliminate or minimize double and triple slotting that maximize storage space but increase stress of accessing tightly stored goods.
- Rotate pallets regularly on the racks in order to make merchandise more easily accessible.
- Provide pallet positioners and turntables to make goods more easily accessible.
- Use elevated rack positions as overstock storage areas and not for order picking.
- Use proper lifting techniques. <sup>ii</sup>

---

i **Forklift truck operator training rules and regulations** [29 CFR 1910.178 \(i\)](#) RICA Forklift Training Bulletin 41 & 41-S

ii **Tips on Lifting Republic Indemnity Loss Control Bulletin**  
<http://www.republicindemnity.com/losscontrol/bulletins/LC08-tipson.htm>

---

The guidelines provided in this bulletin are only intended to provide an overview of some of the more important steps that can be taken by management to establish a safe workplace. The guidelines are not considered exhaustive of all measures and controls that can be implemented by management to address all potential loss or injury producing causes. Ultimately it is the responsibility of management to take the necessary steps to provide for employee and customer safety.