PALLE T RACKING
INSPECTION PROGRAM

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INTRODUCTION

When do warehouse storage racks need inspection?

When was the last time you had your warehouse and storage racks independently inspected for integrity and safety? Would any of your supervisors or line managers respond, "What do I mean "independent" inspections?

Or -- of greater concern -- would they scratch their heads and ask "What do you mean, rack inspection?"

Few warehouse operators have aggressive in-house rack inspection programs in place. Forklift accidents, collisions, dropped or misplaced loads, and other incidents that result in rack damage may or may not get promptly reported.

But even when a forklift hitting the front end corner of a rack gets reported, a typical management response never goes beyond "let's go take a look," as if a quick visual inspection alone will confirm that load limits and structural integrity of the rack have not been affected by the accident.

It's as if, while other hazards "stand out" to otherwise reasonable and prudent supervisors, there often is an absolute lapse in concern for 100,000 pounds of rack and product collapsing in a pile across the tight confines of a busy warehouse.

It is especially important to have trained, competent and CONCERNED rack safety personnel when there is a high degree of activity in the warehouse, where there is the greatest risk of rack damage due to mechanical materials handling equipment.

When a rack has been struck by a forklift, one of the first priorities should be to identify any unsafe components in order to reduce the dangers of collapse. Specific precautions and taking damaged segments out of service immediately may be the only prudent response to prevent possible risk of injury to personnel caused by continued use of damaged racking.

Rack safety is the employer's morale responsibility and comes with substantial legal liabilities (civil and criminal). But supervisors should also realize the potential hidden costs of a rack collapse:

- Replacing materials and damaged goods
- Use of temporary storage facilities
- General disruption
- Workers' compensation, general liability and other insurance rate hikes following the loss
- Legal expenses from defending actions resulting from an accident
- Potential fines relating to violations of statutory safety requirements.
1. Racking design and Materials Handling Equipment

Storage racking for products on pallets should be designed specifically for the size, shape and weight of the products being stored. The racking design should be compatible with the pallets and the materials handling equipment in use within the workplace. Aisle width should be matched to the turning circle of the forklift or other materials handling equipment used to put-away, replenish or pick.

2. Safe Working Loads

Regular inspection of racking should be conducted both in-house and independent to check its integrity, identify maintenance requirements and to ensure racking is not overloaded. **Do not exceed the Safe Working Limit (SWL) for the unit load or the safe working total load per bay for the racking.**

There should be some means of ensuring that workers using the racking are aware of its SWL; e.g. having one or more signs in conspicuous locations, such as at the end of all aisles, which contain the following information:

- **a.** racking manufacturer's name and trademark.
- **b.** safe working unit load.

An example of a SWL sign is shown in Figure 1.

*Safety Sign Regulations*

It is now a legal requirement that if a risk or hazard exists, the employer, after appropriate measures have been taken to reduce or eliminate that risk or hazard, shall use appropriate safety signage to advise, warn and instruct personnel of the nature of the risks - and take the necessary measures to avoid or protect against them. It is also a requirement that each employer provides (and ensures that each of their employees receives) accurate, comprehensible and relevant information regarding safety signage. Also they must ensure that suitable and sufficient training is given in relation to the meaning of safety signs and the measures needed to be taken in relation to them.

3. Altering the racking design or components

Any alterations to the racking should be scrutinised by a competent person and should take into account the effects on the SWL. Operating procedures, signs and drawings should be amended accordingly.

*In a broad sense, a competent person is an individual who, by way of training and/or experience, is knowledgeable of applicable standards, is capable of identifying storage equipment hazards relating to the specific operation, is designated by the employer, and has authority to advise on appropriate actions*

Physical alterations to uprights, bracings, beams or components, such as welding on additional components, should **not** be made.

Replacement of uprights, bracings, beams, clips or other components should be with compatible parts. If not practicable, an engineering report should be obtained confirming the integrity and SWL of the racking with these alternative replacement parts.
4. Operating instructions

Procedures need to be in place within the workplace to ensure that operations are conducted safely with regard to the racking design, the load and capability of lifting equipment.

Figure 2 shows a typical sign that can be used to remind managers and employees of workplace procedures for the safe use of racking.

Operating instructions need to be provided which include but are not limited to:

1. the correct application and use of the equipment
2. the safe working loads to be adhered to
3. prohibitions on unauthorized alterations

The requirement to report any damage incurred due to impact so that its effect can be inspected and assessed (see also Inspection of Pallet Racking below).

5. Goods on Pallet to be stored in racking.

Goods stored on pallets destined for storage are termed Unit Loads. The design of the pallet should take into account the nature of the goods in the unit load. A change in the pallet design should not be permitted unless the:

- racking design is suitable to support the weight of the unit load, and
- pallet design keys into the racking and so prevents the unit load from being dislodged.

An assessment of any change to the pallet design should be conducted by a competent person to prevent storage problems arising, such as:

- changing from wooden pallets to post pallets meaning that the legs do not key into racking
- using pallets larger than allowed for in double pallet racking, as they can overlap pallets behind or push them off their supports
- using pallets smaller than allowed for in the racking, as they can drop through
- using skid pallets in racking without timber decks, as they can drop through.

Boxes, cartons and other such items stored on pallets should not overhang the pallet. Unit loads on upper levels containing boxes, cartons and other loose loads should be effectively prevented from falling by wrapping, strapping or by some other means.

6. Collision protection

Bottom portions of those frames that are exposed to possible collisions by forklifts or other moving equipment should be protected with post protectors.

7. Damage reporting

Employees are responsible to report any damage or near miss occurrences, however minor, to the supervisor so that its effect on safety can be immediately assessed and the hazard eliminated or risks reduced.
**INSPECTIONS: WHAT TO LOOK FOR?**

**Safe working limits**

**Are rack load signs posted?**
Check that the bays conform to the SWL signs provided by the designer / installer, and that the racks have not been altered.

**Uprights and footplates**

**Are uprights damaged?**
If the upright shows significant damage, or is twisted or contains splits or cracks, then replace it or splice a new section in. If the upright is damaged and is to be replaced, ensure the footplate is also replaced as it will also have sustained damage.

**Are splices in good condition?**
Check the condition of any splices. Ensure that they are in accordance with manufacturer's technical specification.

**Out of Plumb Racking**

**Is the racking vertical?**
Out of plumb racking is usually due to incorrect installation. Contact the manufacturer or installer.

**Braces**

**Are racking braces damaged?**
Replace bent horizontal or diagonal braces. See attached table.

**Are floor anchors installed?**
Check that floor anchors are installed and are not damaged. Replace as required. If the floor anchor has been damaged, it is likely that the footplate will have also received damage and may need replacing.

**Beams**

**Are beams overloaded?**
A large amount of beam deflection indicates overloading of the racking (the maximum deflection of a beam should not exceed L/180 of the box sections length). Where two beams connect at an upright, the beam connectors should remain reasonably parallel. If racking is overloaded or has occurred previously, the beam connectors will form a `V`. This is a quick and easy guide.

**Are beams damaged?**
Check for obvious signs of beams being hit by a pallet or forklift. Damaged beams should be replaced.

**Are beam connectors or safety clips missing?**
Examine beams for damage and replace missing clips immediately. If clips are regularly being dislodged, contact the manufacturer or installer to determine why they are being dislodged and implement corrective action.

**Has a beam popped out of its upright?**
Check that beams have not popped out of the upright and are suspended on one end connector only.

**Are welds damaged?**
If a beam has been hit and may only show minor damage, ensure welds are checked by a competent person for cracking.
RACKING CONCERNS

- Poor Lighting
- Unbalanced Pallet
- Damaged Beam Connector
- Out of Square Upright
- Broken Pallet
- Permanently Bent or Top Damaged Beam
- Excessive Beam Deflection
- Baseplate Damage
- Upright Damage
- No Back Connectors
- Not enough space above load
Typical Frame Sections & Measurement Tolerances for Frame Damage

View in Frame Direction

View in Beam Direction

Typical Beam Section & Measurement Tolerances for Beam Deflection

Maximum Allowable Deflection Under Load = \( \frac{\text{Beam span}}{180} \)

Maximum Vertical Deformation, NO Load = \( \frac{\text{Beam span}}{180} \times 20\% \)

Maximum Lateral Deformation, NO Load = \( \frac{\text{Beam span}}{180} \times 40\% \)
# INSPECTION REPORT – LOCATIONS

Employee: ___________________________  Date: ___________________________
Names: ____________________________________________

**CODE**

<table>
<thead>
<tr>
<th>CODE</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Requires urgent repairs</td>
</tr>
<tr>
<td>2</td>
<td>Requires non-urgent repairs</td>
</tr>
<tr>
<td>3</td>
<td>Suggested modifications</td>
</tr>
<tr>
<td>4</td>
<td>Other observations</td>
</tr>
</tbody>
</table>

**NOTES**

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Authorized Supervisor/Manager: ___________________________  Presented Date: ___________________________
All measures have been taken to cover all aspects of visual racking inspection in this report, ideally common sense must prevail, should any damage be questionable in nature, proper steps should be taken to secure racks & affected area. Further, do not hesitate to contact myself directly regarding any concerns you may have.

Best regards,

INTERACK SYSTEMS
per. Ryan Goede – General Manager
div. 1619621 Ontario Inc.