



**DAMOTECH**

# The 6 Principles of a Best-in-Class Rack Safety Program

Presented by: **Marc Rousseau & Robert Gibson**

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# TODAY'S GUEST SPEAKERS



**Marc Rousseau**

VP National Accounts &  
Strategic Partnerships



**Robert Gibson**

Field Support Specialist

# Why Rack Safety?



**Racks are *highly efficient* structures that require components to be free from damage to fully bear the loads placed on them.**



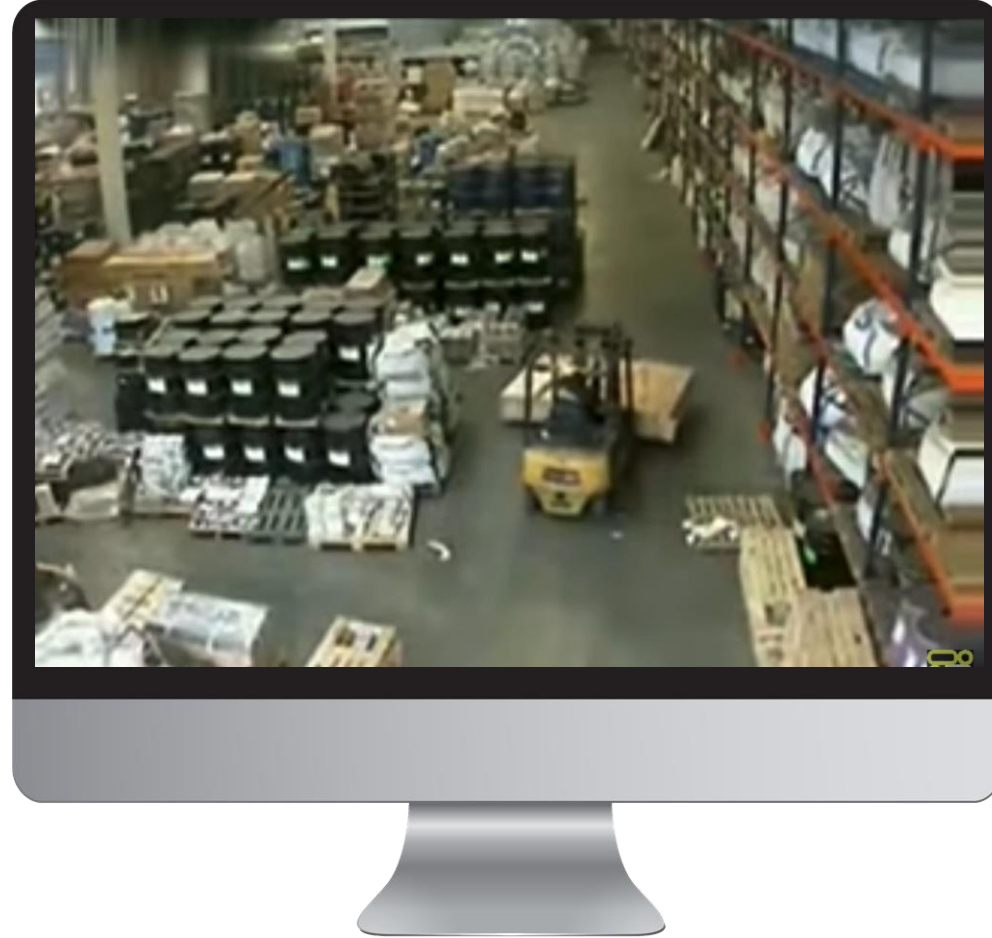




## FROM SMALL DAMAGE TO RACK COLLAPSE



# Video 1





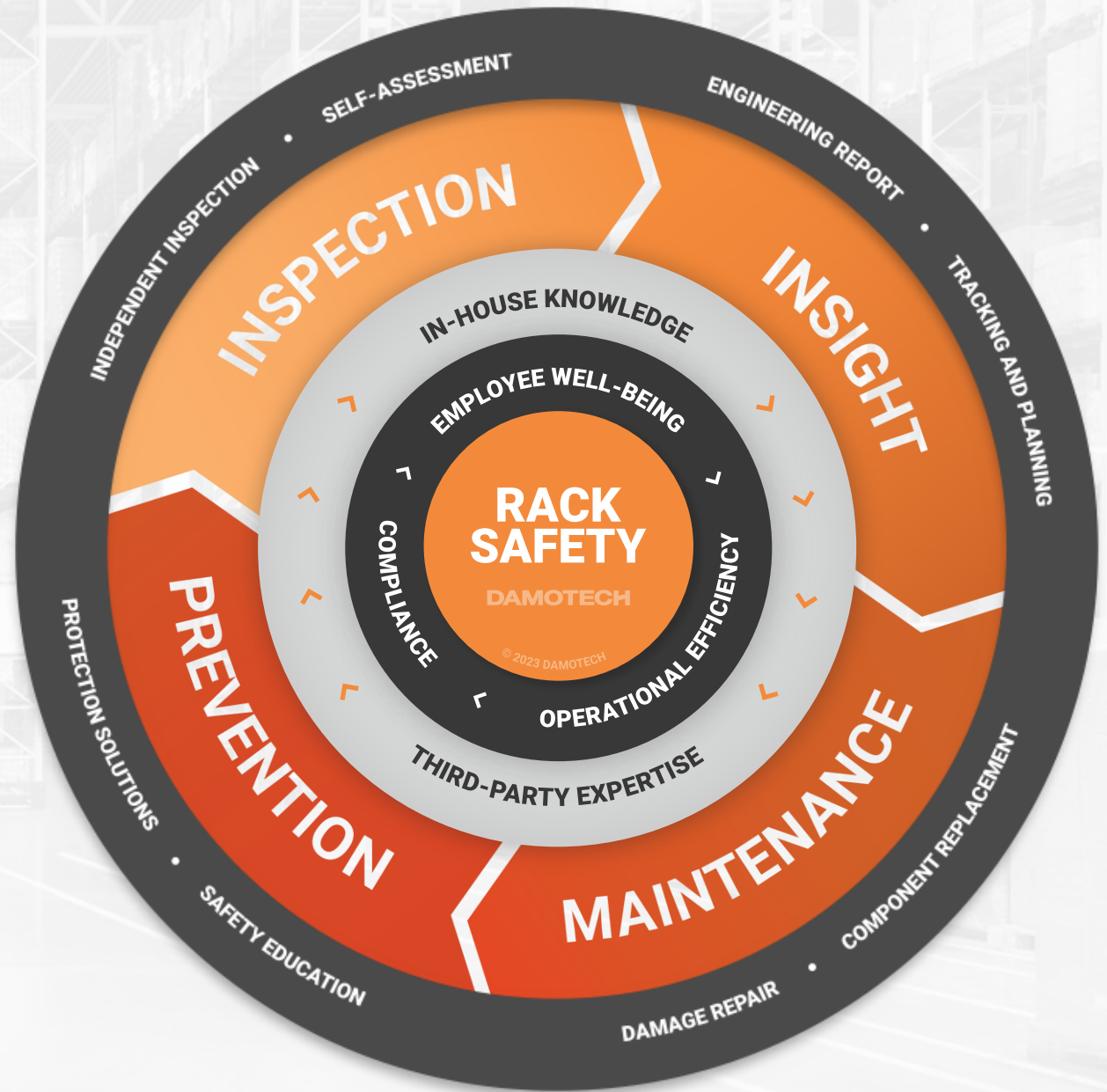
# Video 2





# RACK SAFETY FLYWHEEL

How to Implement a Rack Safety Program





INSPECTION



# RACK DAMAGE

Is a *collapse imminent*  
or is the damage not an  
immediate concern?



QUICK POLL

# How often should racks be inspected?





## INSPECTION

# Frequency / Who

**Yearly Inspection**  
by third party  
(engineer)

**Monthly Inspections**  
by trained warehouse  
employees

**Weekly**  
Situational  
(receiving/shipping)

**Daily**  
High-velocity aisles  
or areas



# INSPECTION

## When to inspect...

**Incomplete  
Documentation**

**Reconfiguration  
of Racks**

**New Rack  
Installation**

**Accident,  
Collapse or  
Earthquake**

**Corporate Safety  
Initiative**

**OSHA Visit**

**Pre-purchase /  
Change of Tenant**

**Performance  
Benchmarking**



## INSPECTION

# Independent inspections

- ✓ **Third-Party Audit**
- ✓ **Conformity to Codes & Standards**
- ✓ **Performed by Trained Engineers**
- ✓ **Detailed Report**
- ✓ **Key Findings**







# INSPECTION

# Independent inspections

- Damaged components (1-2-3 rule)
- Buckling
- Verticality
- Clearance
- Row spacers
- Braces
- Stability: H/D ratio, anchors, baseplate, shims, cross-aisle ties and row spacers

## Uprights

- Beam deflection
- Damaged beams
- Detached or unclipped beams
- Incompatible beams
- Safety bars
- Pallets
- Double-stacking

## Beams

- Protection against falling objects
- Unsafe operations methods
- Flow of forklift trucks
- Workstations (out of traffic)
- Availability of LARCs

## Safety

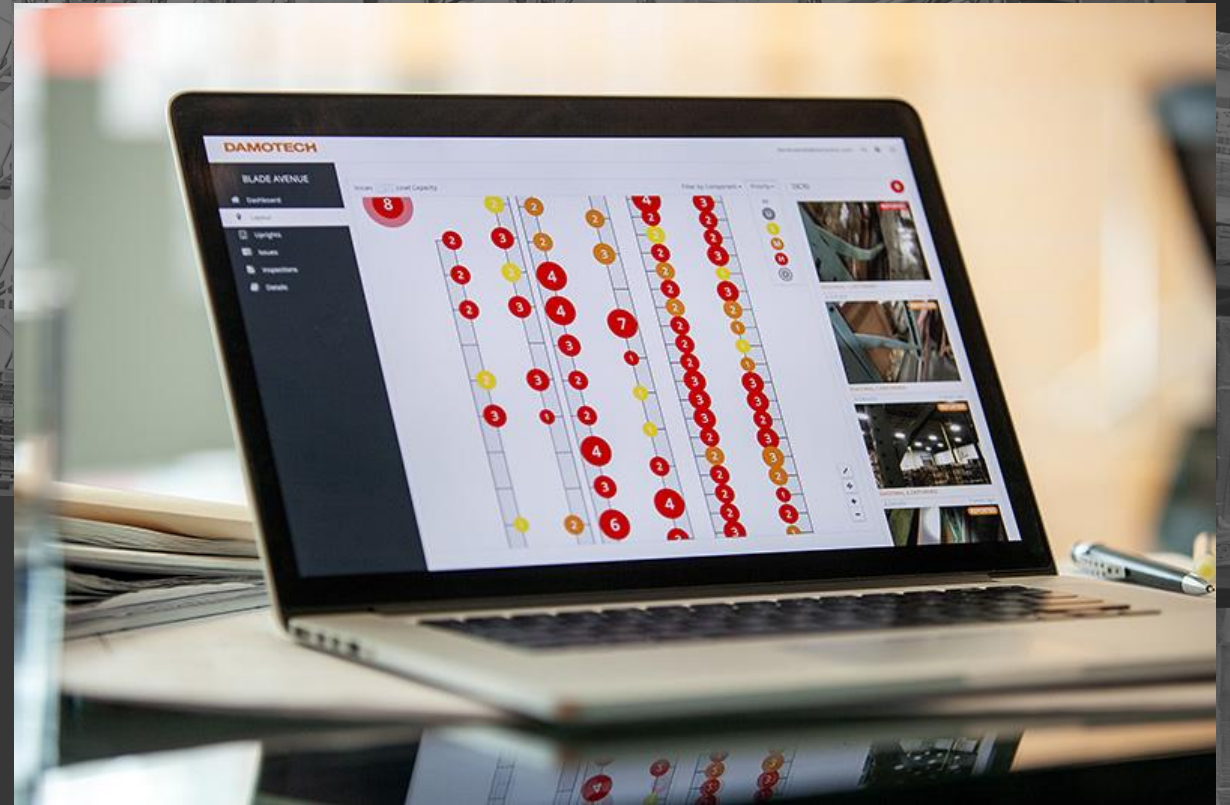
- Rust
- Welded Repairs
- Racking Conditions
- Sprinkler Clearance
- Display of Load Capacities
- Adequate lighting

## Other



# INSIGHT

- ✓ Inspection report findings
- ✓ Stamped report
- ✓ Excel files (database) with links to images
- ✓ Visualization layout of the issues
- ✓ Summary with recommendations for most critical areas to address first
- ✓ Load capacity labels and/or plaques (if in scope)

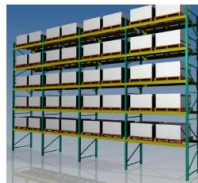


# Detailed engineering report

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## Rack Engineering Assessment Report

At: Sample  
1234 Warehouse road, XYZ, ST (USA)



Prepared by:  
Name 1

Reviewed by:  
Name 2

Version 01  
March 27, 2019

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### 3.2 Inspection Highlights

A total of X rack systems containing X upright locations were inspected. The inspectors recorded X issues/deficiencies throughout the facility, distributed mainly between low, moderate and high priority. X locations were flagged as "Unload" and communicated to the warehouse manager before leaving the site.

As shown in Figures 2 and 3, the most common issues are damaged braces, followed by columns.

All of the observed deficiencies are reported in APPENDIX D. Of these issues, some are actionable, and some are flagged as "Watch". This typically means that damage is present, but it falls within acceptable tolerances.

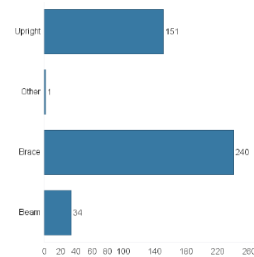


Figure 2. Issue distribution by component type

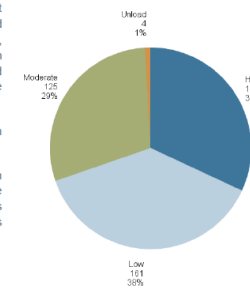


Figure 1. Issue distribution by priority

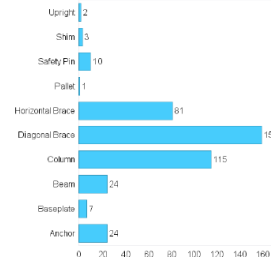


Figure 3. Issue distribution by component

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### 3.3 Key Findings

The majority of the more severe damage was identified in the dry area, with relatively minor damages in the cooler and freezer, by comparison. Many of the overall "high" and "unload" priority damages are related to damaged uprights and columns. The columns are mainly deformed and/or twisted. These columns have been weakened by impact and no longer carry their full original capacity. We recommend proceeding with the required column repairs and replacing the current guards with more adequate protective devices.

Some of the double-deep push-back systems have their capacity limited to 2150 lb/pallet because of the limited capacity of the middle beam supporting the cart rails. Using stronger beams would bring the capacity to 2500 lb/pallet or more for most of these systems.

Racks were seen to be in close proximity to building columns in several areas (as shown in Figure 4). Refer to Appendix F.21 for information about allowable rack and building structure separation.



Figure 4. Column proximity issue



Figure 5. System over the docks

System X above the dry dock (Figure 5) is fully dependent on the building structure for stability. As such, we cannot certify the capacities of this system. The load capacity of this system should be certified by a qualified building engineer. Refer to Appendix F.21 for more information.

Many push-back systems had horizontal braces in the second span that were welded (Figure 6). Welded repairs on racks are not recommended. Please note that all welded repairs on racks must be designed and certified by an engineer and carried out by a certified welder. Refer to Appendix F.16 for more information.

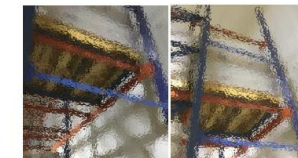


Figure 6. Welded brace repairs

6/18



# Issues are prioritized by degree of severity

**Unload**

**High**

**Moderate**

**Low**

Unload and  
address ASAP

Address  
ASAP

Address in a  
timely manner

No immediate  
action needed  
(watch)



# MAINTENANCE

Develop plan to fix high priority issues ASAP

## ✓ Repair vs Replace

Know the different approaches

## ✓ Factors to consider

1. Manufacturer cycle time
2. Impact to operations







MAINTENANCE

# Component replacement







## MAINTENANCE

- ✓ Engineered solution
- ✓ Must restore load capacity
- ✓ Maintain the original configuration
- ✓ Bolted solution to avoid field welding
- ✓ Minimized impact on operations

# Rack repair





# MAINTENANCE

# Comparison

## Upright Replacement



**Months**

Delivery

**Downtime**

Unloading

**Hours**

Installation

**Anytime**

Repeat Damage

## Permanent Repair



**Weeks**

**Minimal**

**Minutes**

**Built-in Protection**



**PREVENTION**

# Protection Solutions

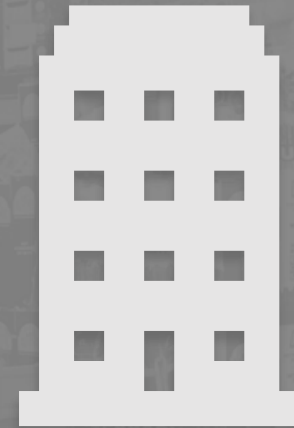
Protect areas likely prone to future accidents and damage



**People**



**Products**



**Assets**





PREVENTION

# Protect People & Products







PREVENTION

# Protect Assets







PREVENTION

# Protect Assets

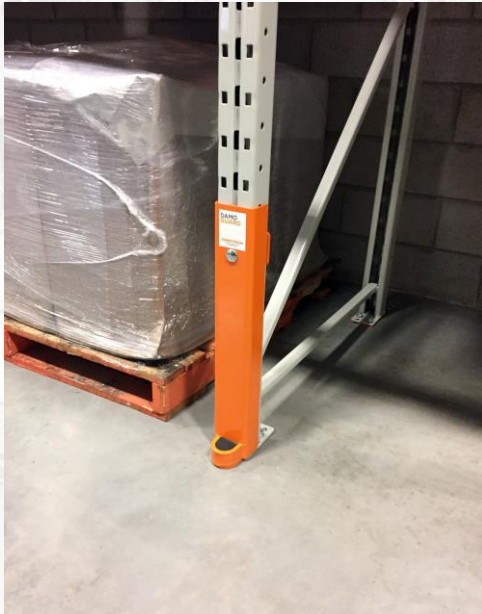




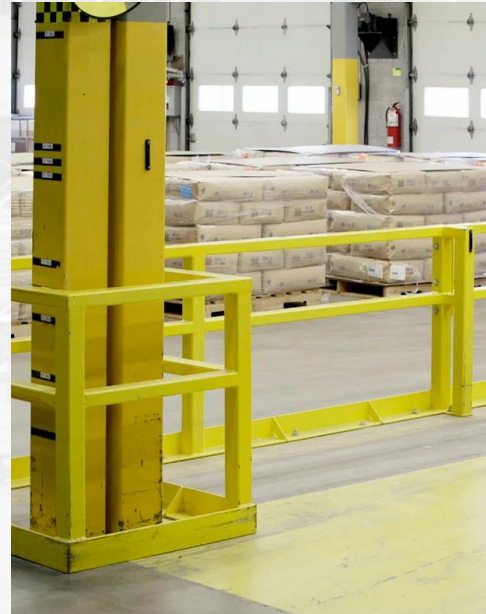


**PREVENTION**

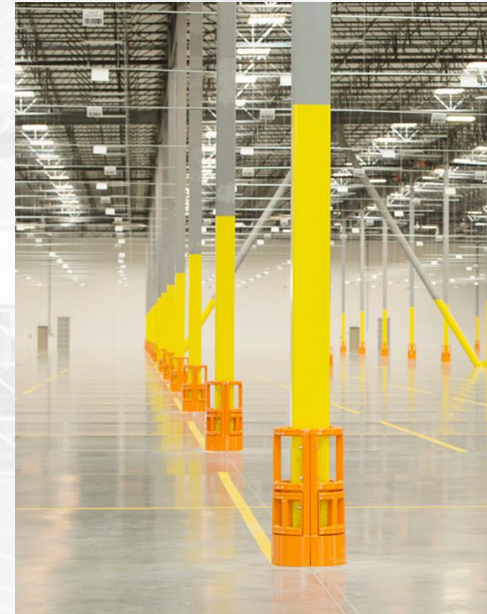
# Protection Solutions



**UPRIGHT**



**FENCING**



**BUILDING COLUMN**



**Rack safety is an  
ongoing process...**



IN-HOUSE  
KNOWLEDGE

# Benefits of Safety Education

## Empower Others

Train key site personnel to ID key issues during periodic self-inspections

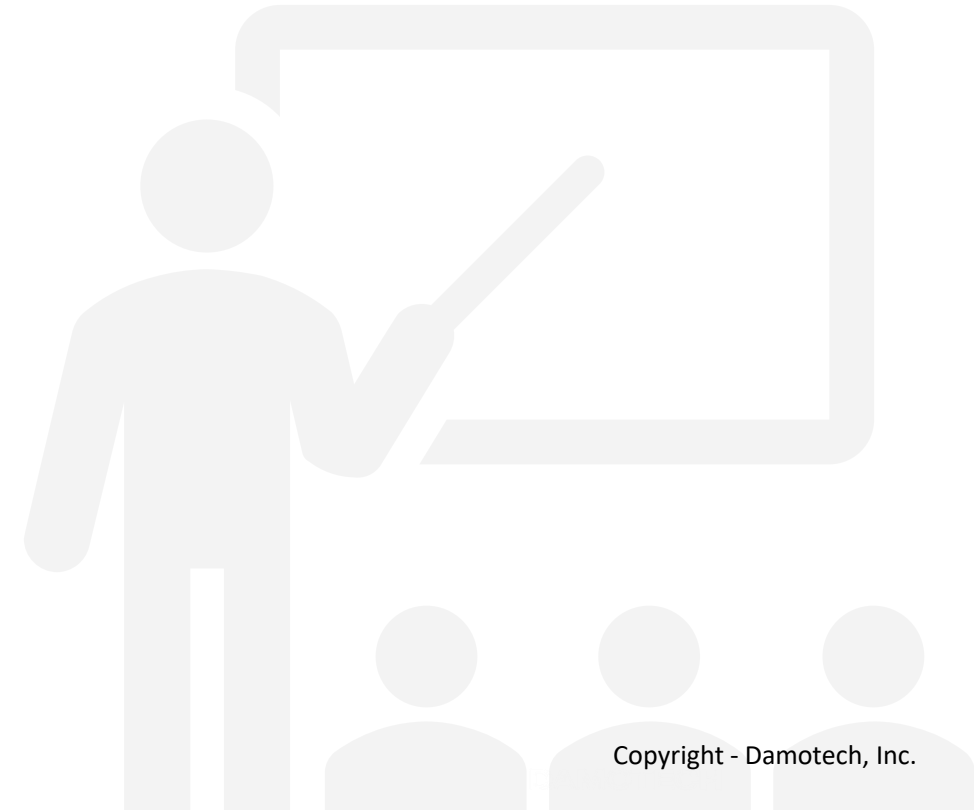
Reduce injuries

Reduce maintenance costs

Reduce liability

Extend the life of racks

Increase productivity







IN-HOUSE  
KNOWLEDGE

# Employee Training

Being told to be safe is not enough

Better behavior comes from:

- Awareness of regulations
- Ability to recognize risks
- Understanding consequences
- Empowering workers

Culture impacts safety

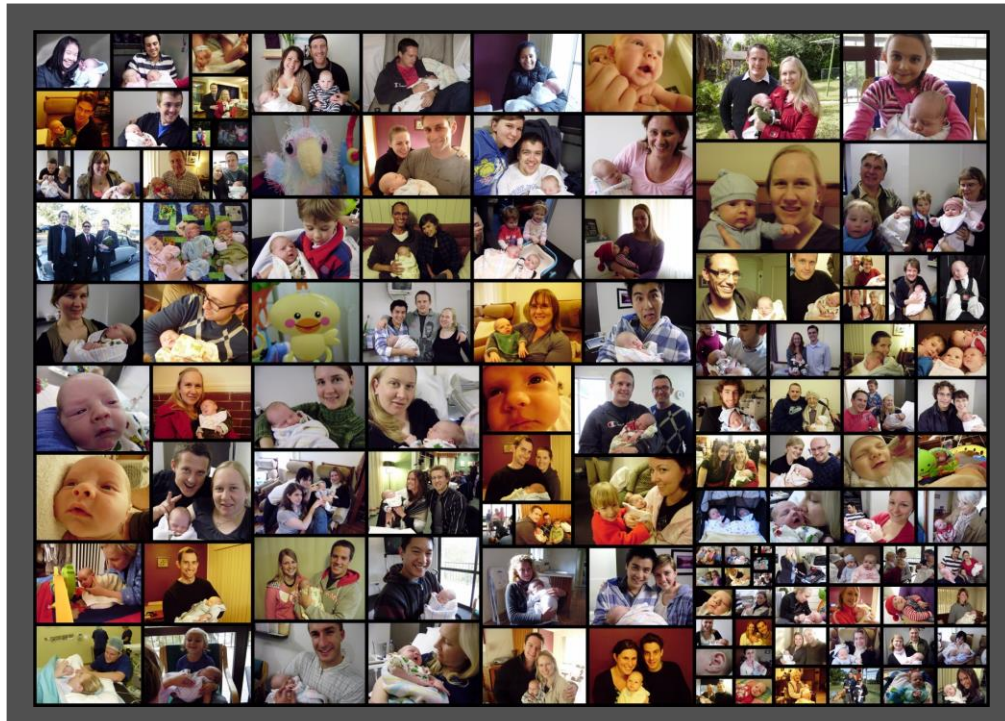




IN-HOUSE  
KNOWLEDGE

# Employee Training

THIS IS WHY WE WORK SAFE





IN-HOUSE  
KNOWLEDGE

# Employee Training

## Training for everyone

- Senior Management
- Managers:
  - *Safety*
  - *Operations*
  - *Maintenance*
- Forklift Operators



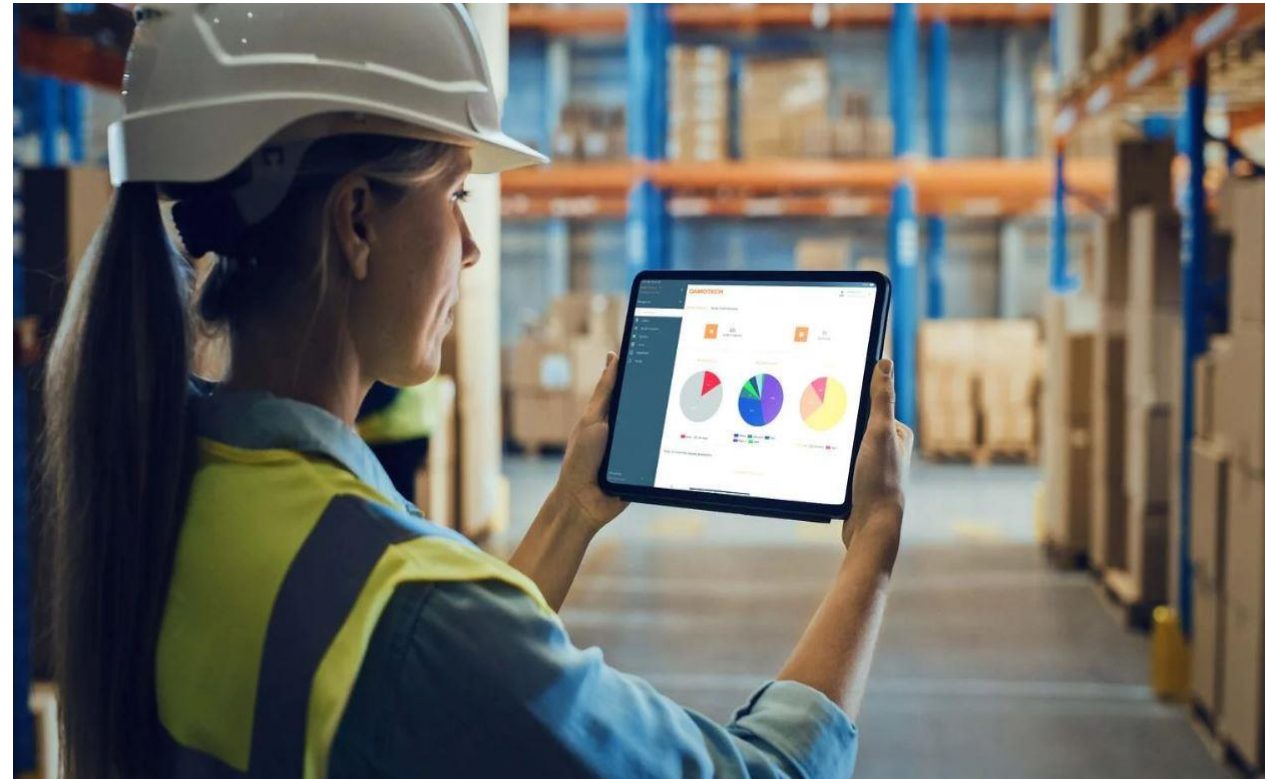




## THIRD-PARTY EXPERTISE

### Track & Report – Why?

- Clear communication through chain of command
- Drive accountability
- Monitor progress

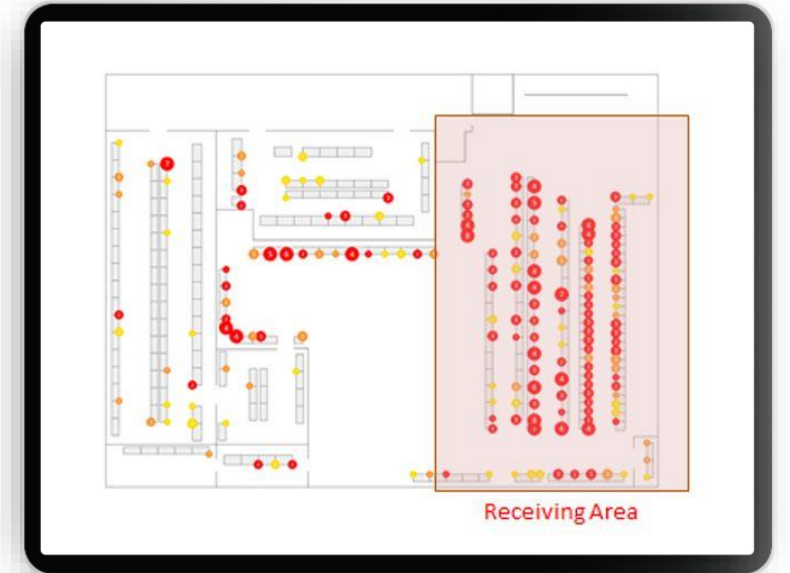




## THIRD-PARTY EXPERTISE

### Track & Report – What?

- LARCS - Load Application and Rack Configuration drawings
- Inspection reports
- All known issues
- Modifications & repairs
- Employee training records



TRY OUR DEMO

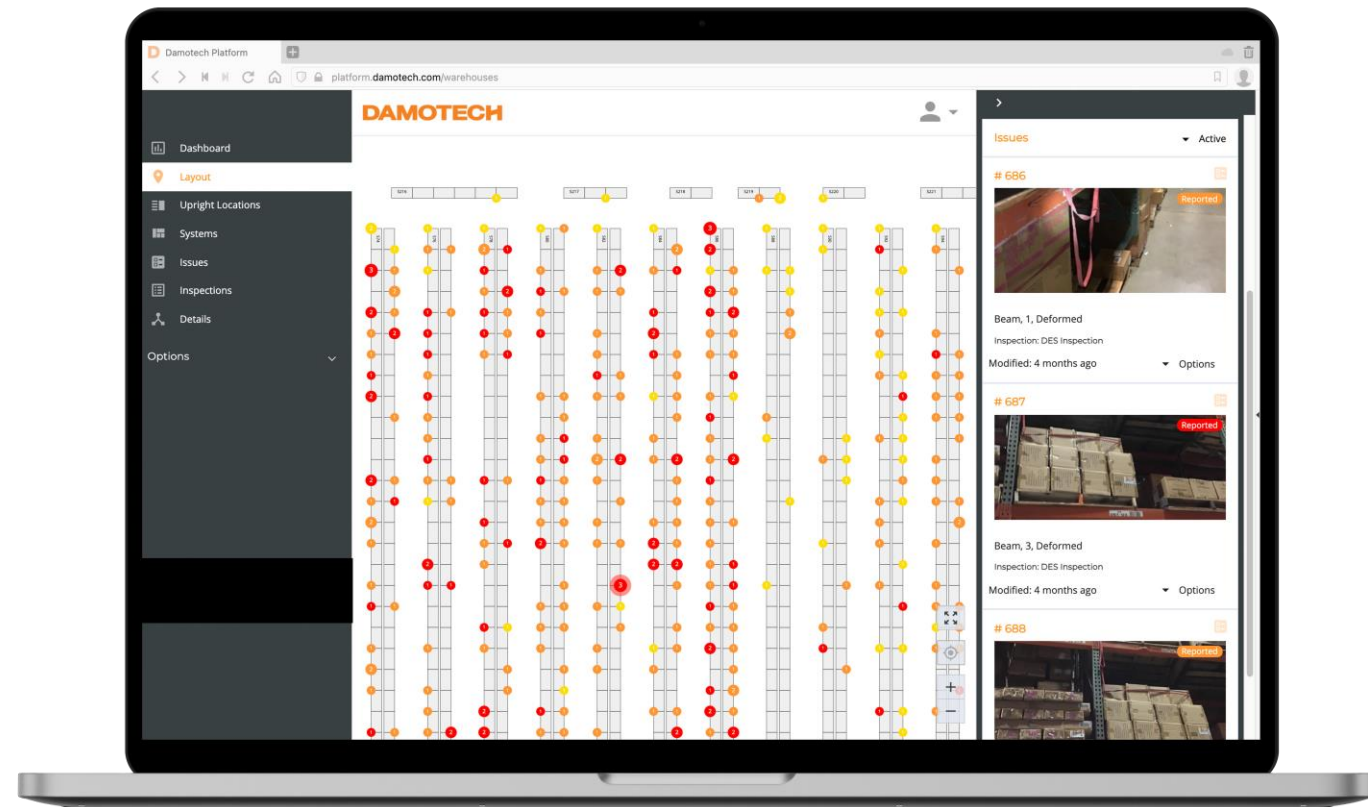






THIRD-PARTY  
EXPERTISE

# Tracking of Inspection Issues





THIRD-PARTY  
EXPERTISE

# Find a Reliable Partner

Helps you plan for the long term

Partner vs. supplier

Offers a wide range of products and services

Leverages software to manage inspections and track issues

Has engineers on staff

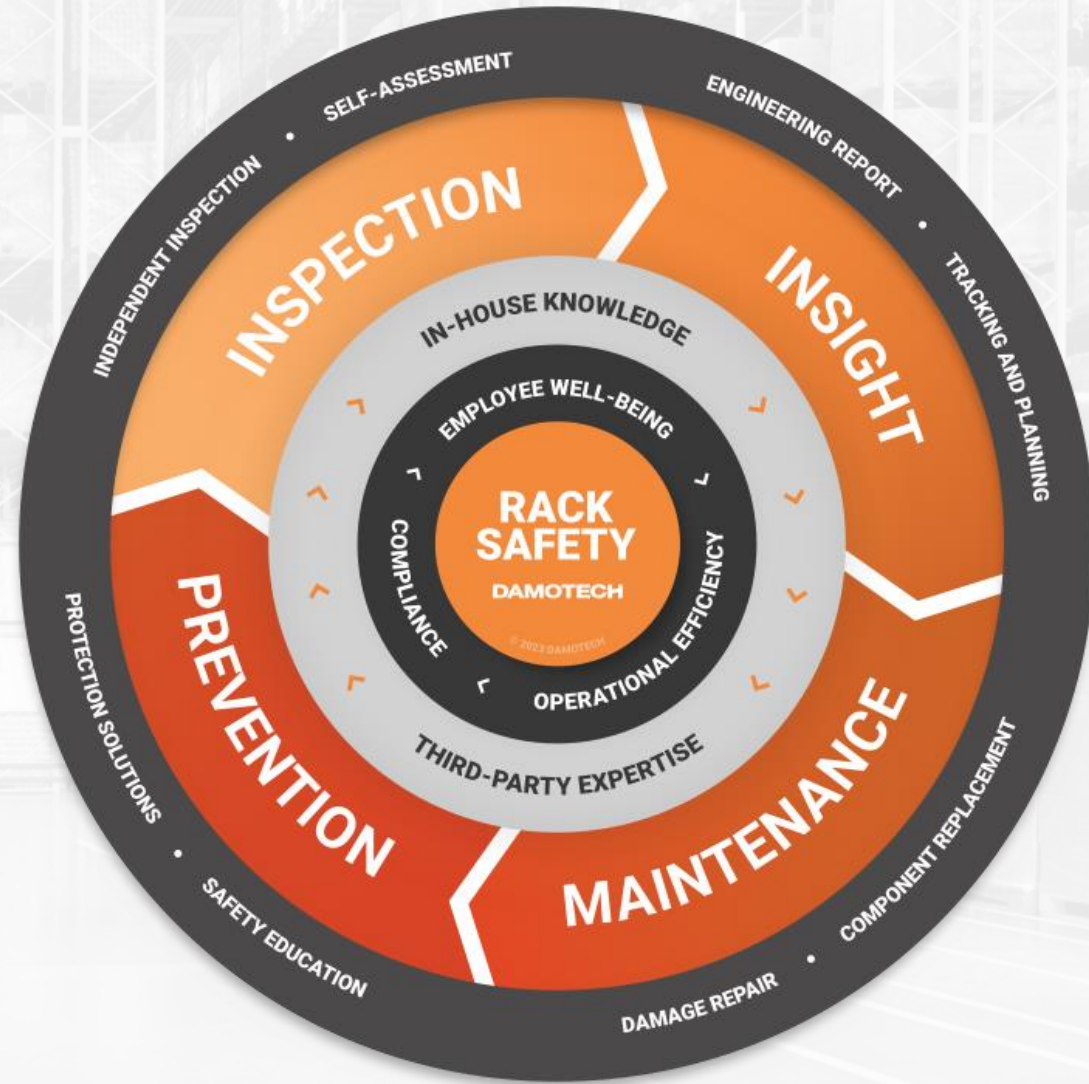
Offers national coverage / network of dealers





# RACK SAFETY FLYWHEEL

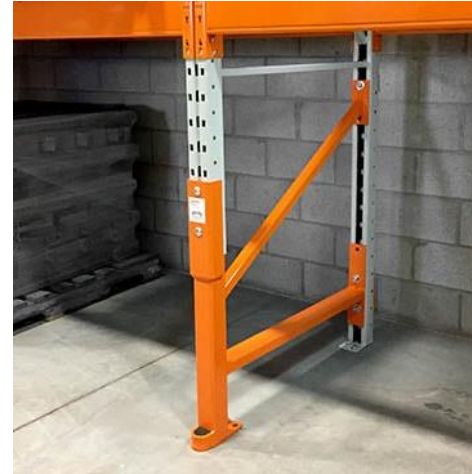
Remember to Implement  
a Rack Safety Program



## SAFETY WHEEL

# ABOUT DAMOTECH

How we can help you today!



## Damotech: Rack Safety Partner

- ✓ Integrated solutions
- ✓ Largest provider in North America

## Engineering Expertise

- ✓ Conformity inspections
- ✓ Load capacity calculations
- ✓ Rack safety training

## Safety Products

- ✓ Rack repair solutions
- ✓ Rack protection kits
- ✓ Lifetime warranty

## Damotech Platform

- ✓ Rack asset management
- ✓ Inspection software
- ✓ Multi-warehouse platform

# Explore our blogs at [damotech.com/blog](https://damotech.com/blog)

The screenshot shows the top navigation bar with the Damotech logo and links for Blog, Content, Support, My Damotech, Careers, FR, and a phone number. Below the navigation is the main heading "DAMOTECH RACK SAFETY BLOG" and filters for Topics (All Topics) and Sort (Viewing: Most Recent). The main content area features three article cards:

- Test Your Knowledge Quiz: Pallet Rack Safety**: Online quiz games and free online trivia games are some of the most effective ways to test one's understanding of a certain...
- Tornadoes and Warehouse Safety: How to Protect Pallet Racking Systems**: Did you know that, between 2017 and 2021, tornadoes caused nearly 7.2 billion dollars in property damages in the United...
- Minimum Distance Between Pallet Racking Systems & Building Structures**: Are you looking for warehouse racking safety guidelines? Here's what you need to know about clearances in the warehouse. Our...

Each card includes a "MORE" button. Below the articles are three more image placeholders: an Amazon warehouse at night, a close-up of a white spherical object, and a worker in a safety vest.

The graphic features an orange background with the text "damotech.com/resources" at the top. A white arrow points from the text to a QR code. Below the QR code, there is a stack of various resource documents, including "RACK REPAIR VS REPLACEMENT", "RACK SAFETY ASSESSMENT GUIDELINES", and "PRACTICAL GUIDE TO RACK DAMAGE ASSESSMENT".



A close-up, low-angle shot of a metal staircase railing against a warm, orange-toned background. The railing is made of polished metal and runs diagonally across the frame. The background is a blurred, warm orange color, suggesting an indoor setting with warm lighting.

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