GUIDE

Mechanical safeguards for industrial racking systems

kaiserkraft works.

Why mechanical safeguards are indispensable

1 Initial situation in the warehouse

Modern warehouses use different racking systems and a wide range of load units:

- pallets, mesh boxes and containers
- long goods such as pipes, profiles or timber
- cartons and small parts.
- manual and automated warehouse processes

This creates risks due to:

- dynamic loads (storage, removal, impacts)
- different weights and centres of gravity
- open rack designs
- adjacent traffic and work areas

Typical hazards:

- falling goods
- pushing load units through
- tipping or slipping of goods
- risk of injury to people

Mechanical safeguards reduce these risks immediately and permanently.

2 Purpose of mechanical rack safeguards

Mechanical safeguards have three core tasks:

- protect people
- avoid loss of goods
- secure racking systems in line with standards

They operate **passively,** are **low-maintenance** and **effective immediately** – regardless of organisation or training level.

3 Typical areas of application

- pallet racks
- shelving racks
- flow and mobile racks
- picking areas
- transitions to walkways and traffic routes

Especially relevant when:

- racks are open at the rear
- traffic routes are adjacent
- several levels are used one above another

The three most important safeguard types

1 Push-through guards

Function:
Push-through guards prevent pallets or load units **from being pushed backwards out of the rack**.

Typical design:

- mechanical stops
- cross beams
- end-stop systems

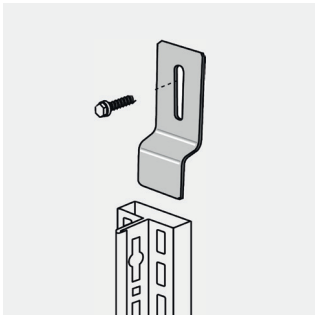
Applications:

- pallet racks with access from both sides
- racks without a rear panel
- flow racks

Benefits at a glance:

- prevents falls to the rear
- protects people and materials
- increases process safety during storage

2 Anti-tip safeguards



Function:
Anti-tip safeguards stabilise load units against **sideways or forward tipping.**

Typical design:

- retaining brackets
- safety rails
- positive-locking elements

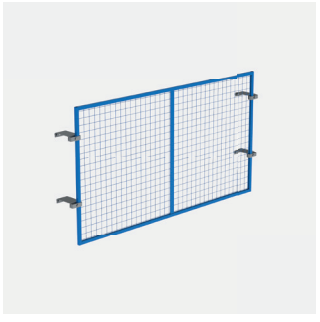
Applications:

- unevenly loaded pallets
- containers with a high centre of gravity
- shelving racks used for picking

Benefits at a glance:

- prevents tipping movements
- reduces accident risk during removal
- stabilises unstable load units

3 Mesh guards



Function:
Mesh guards catch **falling goods or containers** and secure the backs of racks
as well as their sides.

Typical design:

- wire mesh panels
- steel cable nets
- fixed mesh elements

Applications:

- backs of open racks
- transitions to walkways
- traffic routes behind racks

Benefits at a glance:

- protection from falling parts
- clear separation of storage and traffic areas
- especially suitable for small parts

Selection, combination and practice

1 Which safeguard is suitable?

The choice depends on:

- stored goods (weight, shape, centre of gravity)
- rack type (pallet, shelf, flow)
- load type (static / dynamic)
- environment (pedestrian traffic, walkways)

Rule of thumb: The higher the risk, the more safety measures are required.

2 Combination instead of a single solution

In practice, the **combination of several safeguards has proven effective:**

- Push-through guard + mesh guard ▸ protection to the rear and towards traffic routes
- Anti-tip safeguard + mesh guard ▸ stability + catch function
- All three systems ▸ maximum safety during dynamic use

3 Integration into the overall warehouse system

Mechanical safeguards are part of a **holistic safety concept:**

- safe rack selection
- proper storage of pallets in racks
- clear traffic routing
- secured walkways and crossings

Safeguards complement professional planning but do not replace it.

4 Advantages of mechanical safeguards

- effective immediately
- independent of user behaviour
- robust and durable
- can be retrofitted to existing racks
- suitable for many rack types

Conclusion:

Push-through, anti-tip and mesh guards are simple yet effective elements for **fall protection in racking systems.**

They improve safety for people, protect goods and turn racks into **reliable systems in day-to-day operation.**

In short: mechanical safeguards are not optional – they are essential.