

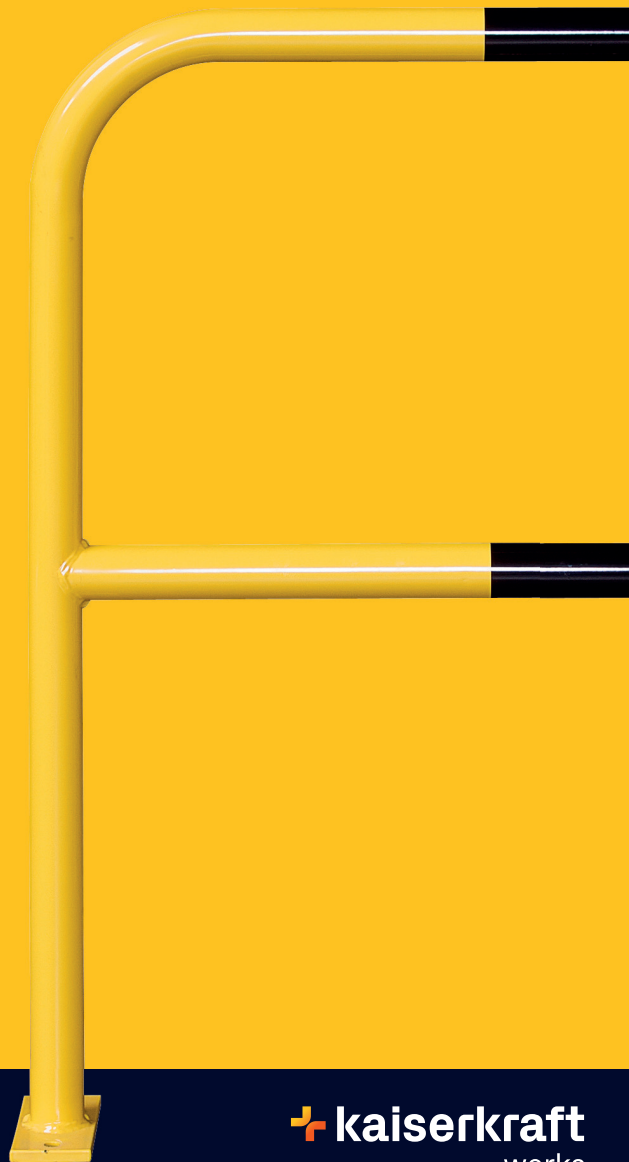


PRACTICAL GUIDE

PAS 13 Impact Protection:
So there are no *crashes in the*
warehouse.

Forklifts drive. People walk. Shelves stand. Machines work. And somewhere there is always a corner that gets "just briefly" touched.

Welcome to perfectly normal warehouse life. To ensure that small nudges don't turn into major damage, there is PAS 13 – the most important guideline for impact protection and traffic management in industrial operations.



What is PAS 13 anyway?

The guideline for certified impact protection in warehouses & production PAS stands for **Publicly Available Specification** – i.e. a publicly available specification from the British Standards Institution BSI.

And PAS 13 is essentially what many operations have needed for years:

- ▶ **a clear standard**
- ▶ **comparable protection classes**
- ▶ **transparent test procedures**
- ▶ **real orientation instead of gut feeling**

Important: Currently there is no globally binding standard that regulates what impact protection in operations should look like. Unfortunately this also means: Some systems look sturdy – and give way at the first nudge.

PAS 13 creates order in the safety chaos.

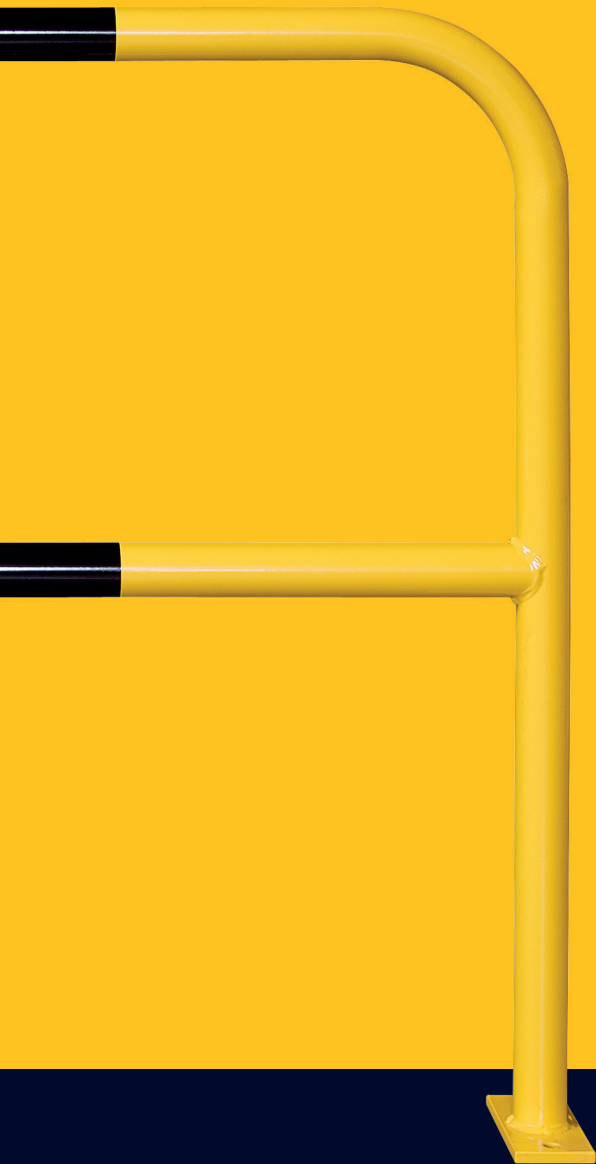
Why PAS 13 is worth its weight in gold for your operation.

More safety. Less damage. And significantly less hassle.

PAS 13 helps you to solve typical warehouse problems:

- ▶ **Pedestrians and forklifts cross paths too often**
- ▶ **Intersections are confusing**
- ▶ **Shelves, columns, or gate frames are at risk**
- ▶ **Traffic routes are not clearly defined**
- ▶ **Protective systems are not matched to the vehicles**

In short: PAS 13 brings structure to warehouse traffic – and measurably reduces risk.





Selecting impact protection correctly: Not by appearance. By energy.

The most important value: the impact energy (KE).

Impact protection doesn't need to "look good". It needs to **be able to absorb impact forces**, without failing.
PAS 13 works with a clear formula:

$$KE = \frac{1}{2} m(v \cdot \sin\Theta)^2$$

Sounds technical? It is. But don't worry – we'll make it simple.

Step 1:

Mass – what does your vehicle actually weigh?

The decisive factor is the total mass including maximum load.

Example: Forklift 4,000 kg + load 600 kg = 4,600 kg

Step 2:

Speed – km/h is converted to m/s

For the formula to work, a conversion is needed:

km/h ÷ 3,6 = m/s

Example: 8 km/h ÷ 3,6 = 2,22 m/s

Step 3:

Impact angle – how "hard" does the vehicle hit?

The flatter the angle, the less energy is transferred.

Typical values:

90° ▶ full energy (sin = 1)

45° ▶ less energy (sin = 0,707)

10° ▶ significantly less (sin = 0,1736)

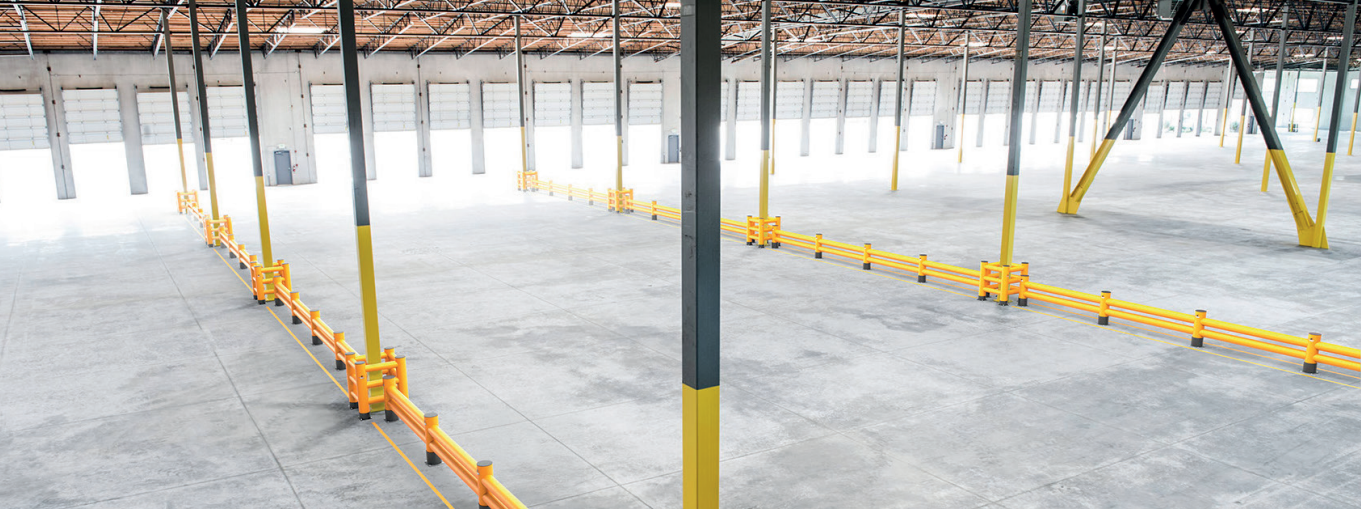
90° is the worst case. And unfortunately it occurs more often than you'd think.

Example calculation: 4.600 kg, 8 km/h, 90° $KE \approx 11.355 \text{ Joule}$

This means:

The impact protection must be able to absorb **at least 11,355 Joules** – ideally with a safety margin.

Because: **A protection system that "almost suffices" is not sufficient in an emergency.**



PAS 13 in practice: How a site assessment works.

Where are the real hazards in the operation?

PAS 13 is not just "testing in the laboratory". Above all, it is about designing operations in such a way that accidents don't happen in the first place.

An assessment looks at, among other things:

1

Pedestrian routes & work areas

People and vehicles must be separated – as much as possible. **Because a forklift always wins.** (And no: "I'll be careful" doesn't count as a safety concept.)

2

Intersection points

PAS 13 recommends:

- ▶ Reduce intersections
- ▶ Optimise route guidance
- ▶ Improve visibility
- ▶ Position protective systems strategically

3

Vehicle routes

When traffic routes are clear, vehicles drive more clearly.

Barriers help in two ways:

- ▶ they **guide traffic**
- ▶ they **protect in the event of a collision**

4

Load-bearing structures & installations

Columns, gate frames, shelves, machines – all expensive. And often only one nudge away from the next standstill.

Here, impact protection is not an extra, but a requirement.

Impact protection according to PAS 13: What you should look out for.

So you don't protect the wrong system.

PAS 13 provides clear criteria:

01

Impact resistance

The protective effect must match the real hazard.

03

Impact zone

Impact protection must be positioned where the impact

Important factors:

- ▶ Load height
- ▶ Ground clearance
- ▶ Wheel diameter
- ▶ Vehicle body

02

Test procedure with repeated impact

Not just one "plop" in the laboratory, but repeated, dynamic, realistic.

04

Visibility

Impact protection must be visible – permanently.

Ideal:

- ▶ Signal colour
- ▶ solid-coloured material
- ▶ no "colour gone, protection gone" appearance after the first collision



Our kaiserkraft conclusion:

PAS 13 is the safety compass in the warehouse.

PAS 13 is not simply a guideline. It is the answer to a reality that every warehouse manager knows:

1. Traffic in the operation is plannable.
2. Risks are calculable.
3. Damage is avoidable.

And the best part:

With a well-planned impact protection concept, you protect not only **people and infrastructure** – but also:

- ▶ Your delivery capability
- ▶ Your machine uptime
- ▶ Your racking systems
- ▶ Your budget



Don't buy based on gut feeling. Buy according to PAS 13. Because the next forklift will definitely come. The only question is: **What happens then?**