SAFETY SOLUTIONS

Pressure sensitive protective devices

Safety edges HSC® |
Safety mats HSM® |
Safety bumpers HSB® |

www.haake-technik.com

Making the world a safer place

With the aim of making the interaction between humans and machines as safe as possible, we have been developing, producing, and distributing innovative safety products since 1987.

In the field of safety technology, where the highest level of reliability is essential, we do not compromise on the quality of our products. By utilising premium materials, we not only contribute to accident prevention but also safeguard and conserve the environment.

We embrace this responsibility day by day.

Offering individual and solution-oriented approaches

Close collaboration with you is of utmost importance to us, serving as the foundation for developing new ideas and tailored solutions that meet your requirements for maximum machine safety.

- **Our solutions are custom-fit to protect people, machinery, and the environment.**

Certified safety solutions

We don't leave anything to chance. All HAAKE product lines leave our factory after thorough inspection.

- **Quality management system – UQS**
- **Quality management according to ISO 9001**
- **Environment management according to ISO 14001**
- **Health & safety according to ISO 45001**

Here you can find the certificates

Contents

More **information** is available **online** at:

www.haake-technik.com

HAAKE Technik GmbH – Innovator in daily use for your safety

When humans and machines come together, the highest safety precautions and standards are required. From the automotive industry to robotics, specialized safety solutions are in demand.

For decades, we have been impressing renowned machine manufacturers, system integrators, end consumers, and public institutions with our innovative HAAKE safety products.

As problem solvers, we support you with specific safety questions and are experts in securing hazardous areas or danger zones using tactile sensors or mechanical key transfer systems, taking into account individual safety requirements and needs.

Jonas and André Haake

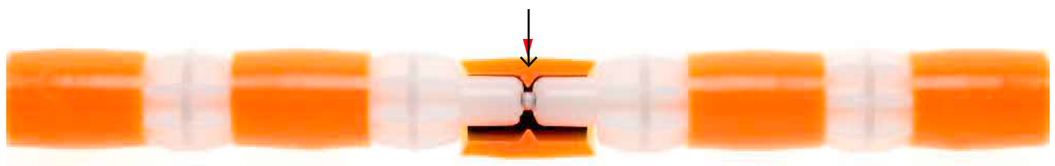
The HAAKE Contact Chain®

Functionality & Structure

A central element of HAAKE products is the HAAKE Contact Chain®. It consists of a series of conductive contact rolls and insulating intermediate elements, known as wedge rolls, which are alternately arranged on an expander cord.

The closed circuit is completed when a defined preload compresses the contact rolls. When the wedge-shaped intermediate elements are actuated, at least one of the contact roll pairs is separated, thereby interrupting the closed circuit. There is no need for signal conversion, as the existing emergency stop module of the machine being protected receives a direct open signal.
To ensure that the shut-down function is activated even with minimal switching forces and a very short actuation path, the contacts are separated not by bending the Contact Chain but by redirecting the outer radial forces into axial forces. This is what makes the HAAKE Contact Chain® so safe.

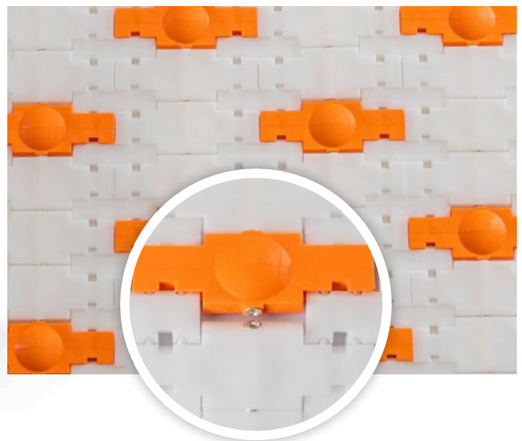
The HAAKE Contact Chain® - closed contact



The HAAKE Contact Chain® - open contact

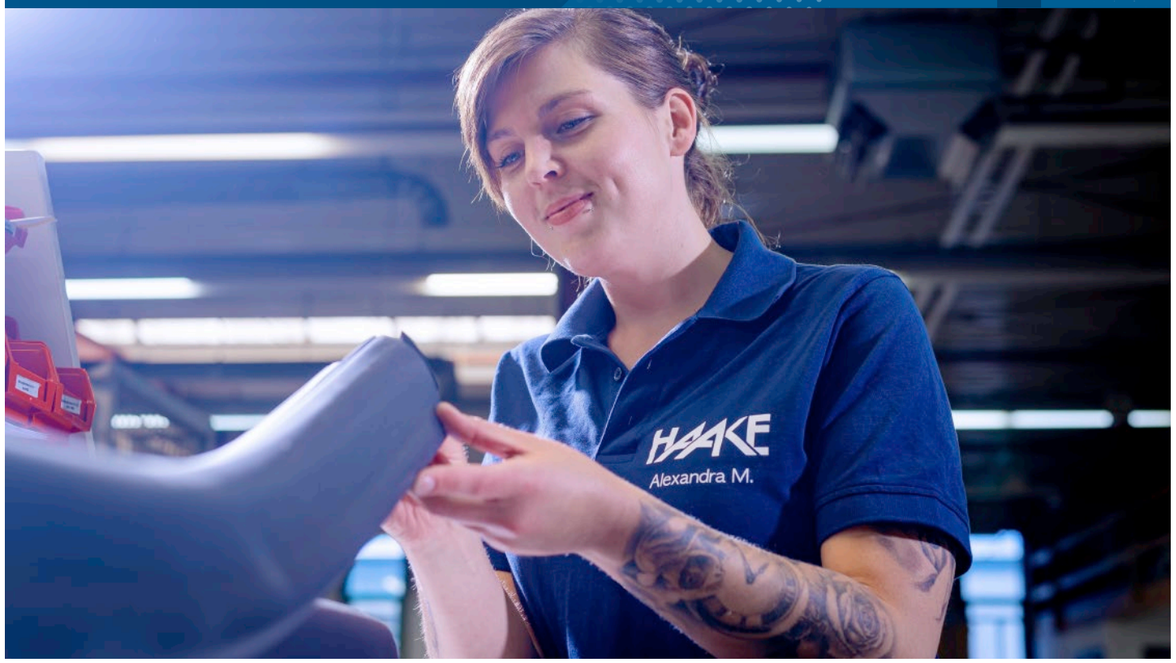
Functionality & Structure HSM®

Safety mats HSM®



Open Contact – when the safety mat is stepped on, the pressure generated leads to a contact break, ensuring swift safety for both humans and machines.

Safety edges HSC®



Pinch points, shearing edges, and crushing edges – No more risks and injuries

Many machines and equipment in businesses or facilities can pose risks to users. Pinch points or shearing and crushing edges, for example, present a significant danger. Without proper protection, the consequences can be dire, such as a trapped hand or worse. Our safety edges prevent such scenarios and eliminate corresponding injuries from the outset.

HAAKE safety edge with sheathing

Application areas (excerpt):

- Lift Tables
- Machine hoods
- Automatic doors and gates
- Packaging machines
- transport systems

What are safety edges HSC®?

In fact, we often encounter safety edges in our everyday lives, such as on lifting tables with pinch edges or on large revolving doors in buildings. Without the HAAKE safety edge, a door like this would continue to rotate even if an arm or leg were caught between the frame and the door panel. The HAAKE safety edges literally put a stop to this.

HAAKE safety edges are touch-sensitive sensors that detect contact with a person or their body part. When a safety edge senses contact or an obstacle, it immediately shuts down the automatic drive of the machine.

Various types of safety edges are offered and installed. There are electrical systems that operate on the normally open principle, and there are optoelectronic safety edges that require an evaluation device to process the switch strip signals.

In contrast, the HAAKE safety edge operates on the normally open principle, which offers several advantages: the system is highly effective in terms of safety, it is reliable, and you do not need a special evaluation device for it.

HAAKE Contact Chain®

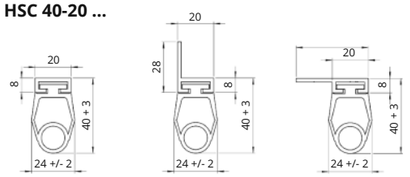
Functionality & structure of the safety edge HSC®

The core element of the HAAKE safety edge HSC® is the HAAKE Contact Chain®. It consists of electrically conductive contact rolls and intermediate insulating elements connected in series. The insulating wedge rolls and the conductive contact rolls are alternately arranged on an expansion cord.

The closed circuit is completed by the defined preload compressing the contact rolls. To interrupt the closed circuit, at least one of the contact roll pairs must be separated. This is achieved by actuating the wedge-shaped intermediate elements. Conversion of the output signal is therefore unnecessary, as a break contact signal is transmitted directly to the relevant emergency stop module of the secured machine.

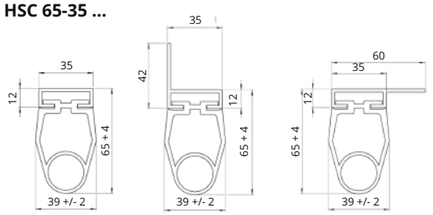
Our standard profiles

HSC 40-20 ...



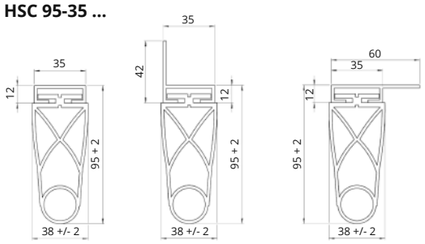
-01 T **-02 T** **-03 T**

HSC 65-35 ...



-01 T **-02 T** **-03 T**

HSC 95-35 ...



-01 T **-02 T** **-03 T**

Looking for a customised design?
Don't hesitate to ask us!
Phone: +49 (0) 2564 3965-0

Safety edge with Contact Chain

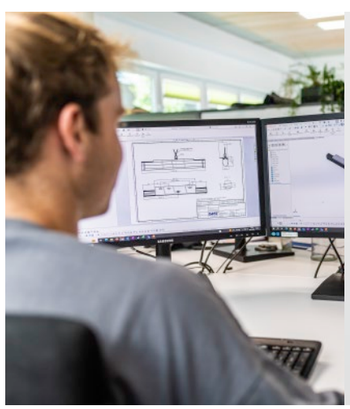
Optimal switching performance: low switching forces and short response times

The HAAKE Contact Chain® is located in the front part of the safety edge. The contact points are not separated by bending the Contact Chain but by redirecting the outer radial forces into axial forces. This ensures that the shut-down function is activated with minimal switching forces and a very short response time.

The remaining overall height of the safety edge profile can be used for overtravel. Especially with regards to injury prevention, large overtravel distances are important features of a safety edge. Due to the rotationally symmetrical structure of the switching elements, the signal transmission of the Contact Chain occurs independently of the direction of operation.

Your benefits at glance

- **Enhanced safety for you:** The HAAKE Safety edge HSC® complies with Category 3 and Performance Level d according to DIN ISO EN 13849-1.
- **Rapid response times and favourable switching characteristics:** The shut-down function is activated even with low actuation forces and a short actuation path. The signal generation of the Contact Chain is independent of the actuation direction.
- **For every requirement:** Our comprehensive range offers you safety edges tailored to your specific safety needs and systems.
- **You save costs:** Since the HAAKE Contact Chain® consists of normally closed contacts whose signal can be directly processed, you do not require additional evaluation devices with costly connection and wiring work.
- **Conformity of your systems:** The HAAKE safety edges HSC® are manufactured in accordance with the harmonised standards and therefore meet all requirements of Machinery Directive 2006/42/EC.
- **Easy installation:** The control strip is connected to the machine or system's existing emergency stop module, following the Plug & Play principle.



Customization – Personal support

If you have specific requirements that our standardised shapes, sizes, colours, or materials do not cover, we'll be happy to develop custom solutions for you.

Find your regional contact person here

Safety edges HSC® – A best practice example

Development of custom safety edges for **ALTEK HebetechnikGmbH:**

In industrial settings, modern lifting and conveying technologies are frequently employed. Many of these systems, such as lifting tables or elevators, are automated and electrically movable, posing potential risks to both people and materials. In the event of a collision, there is a risk of shearing and crushing injuries or, in pinch points, even more severe consequences, such as a trapped hand. To proctect employees it is essential to properly secure these systems.

The high-quality and reliable HAAKE safety edges, known as HSC®, excel in precisely this role. They safeguard automated applications and thereby protect users from potential hazards. When the touch-sensitive sensors of the safety edge detect contact with a person, body part, or any other obstacle, the machine's drive is immediately halted.

Application areas (excerpt):

Lifting and conveying technology

ALTEK®

Securing shearing and pinching edges in lifting and conveying technology

ALTEK Hebetechnik GmbH develops innovative solutions and products in lifting technology for its customers. This includes state-of-the-art lifting tables as well as driverless transport systems and other special equipment.
In addition to their standardized range of safety switching edges, HAAKE Technik provides a variety of safety edge variants designed and manufactured according to individual safety requirements and application scenarios. This also applies to ALTEK Hebetechnik GmbH. For many years, ALTEK Hebetechnik GmbH has depended on HAAKE safety edges to ensure the comprehensive safety of their systems and equipment by securing the shearing and pinching edges of their products.

For more **information** and **case studies**, please go to:

https://www.haake-technik.com/en/case-studies/

Pallet assignment station

System lift tables

Safety bumpers HSB®

Protection against machines with high moment of inertia and long stopping distance

Large and heavy power-driven equipment, such as hangar doors, theatre stages, or driverless transport vehicles, have a high inertia, resulting in long stopping distances. It is crucial to secure shearing and pinching points effectively in such cases. This is where HAAKE Safety bumpers HSB® come into play, as they can absorb even longer braking distances.

Bumper front part with Contact Chain

Application areas (excerpt):

- Theater stage
- Hangar door
- Automated guided vehicle systems
- Lifting and work platforms

What are the bumpers HSB®?

Safety bumpers HSB® are touch-sensitive sensors that detect contact with a person or parts of their body. As soon as the bumper detects contact with a body part or another obstacle, the safety-effective and reliable opening principle ensures the immediate shut-down of the automatic drive. This means that the machine, gate, or vehicle comes to an immediate stop, eliminating potential danger.

While safety edges typically have only one sensor, bumpers can be equipped with mutiple sensors transmitters. This gives them an actuation surface that is usually larger than 80 mm. Therefore, safety bumpers are particularly effective when it comes to securing shearing and pinching points of your large and heavy power-driven equipment.

Interested in how we safeguard a robot? **Then watch the video.**

HAAKE bumpers HSB® are especially suitable for safeguarding large and heavy equipment

Functionality and structure of HAAKE Safety bumpers HSB®

HAAKE bumpers are composed of a foam body with the HAAKE Contact Chain® embedded in its core. The surface of the foam body is coated with highly abrasion-resistant elastic polyurethane. If environmental conditions require it, additional materials and surface coating solutions are available.

The Contact Chain inside the bumper consists of series-connected, electrically conductive contact rollers and insulating intermediate elements, which are alternately arranged on an expansion cord. The resting circuit is closed when a defined preload compresses the contact rollers, and it is interrupted when at least one pair of contact rollers is separated. This is achieved by actuating the wedge-shaped intermediate elements. Conversion of the output signal is therefore unnecessary, as a break contact signal is transmitted directly to the relevant emergency stop module of the secured machine.

Looking for a customised design?

Don't hesitate to ask us!
Phone: +49 (0) 2564 3965-0

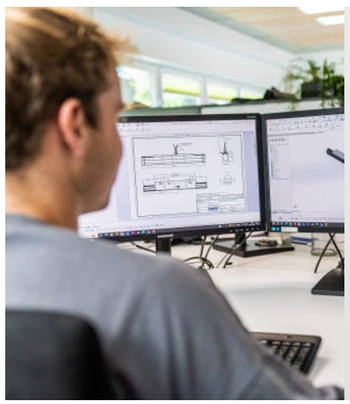
Example of customised HAAKE Safety bumpers HSB®

Round special shape of a HAAKE Safety bumpers HSB®

Here is the link to the **data sheets**

Your benefits at glance

- **Enhanced safety for you:** HAAKE bumpers meet category 3 and performance level d requirements in accordance with DIN ISO EN 13849-1.
- **Quick response times, cost-effective switching properties:** : The shut-down function is activated with low actuation forces and a short response distance. For optimal switching behaviour, multiple Contact Chains can be used as needed.
- **Tailored to your requirements:** Different dimensions, shapes, and colours are possible depending on your needs.
- **Cost-saving:** Since the HAAKE Contact Chain® consists of open contacts, whose signals can be directly processed, there is no need for additional evaluation devices with costly connection and wiring work.
- **System conformity:** Our HAAKE bumpers are manufactured in accordance with the Harmonised Standards and therefore meet all requirements of Machinery Directive 2006/42/EC.
- **Easy installation:** The bumper is connected to the machine or system's existing emergency stop module, following the Plug & Play principle.

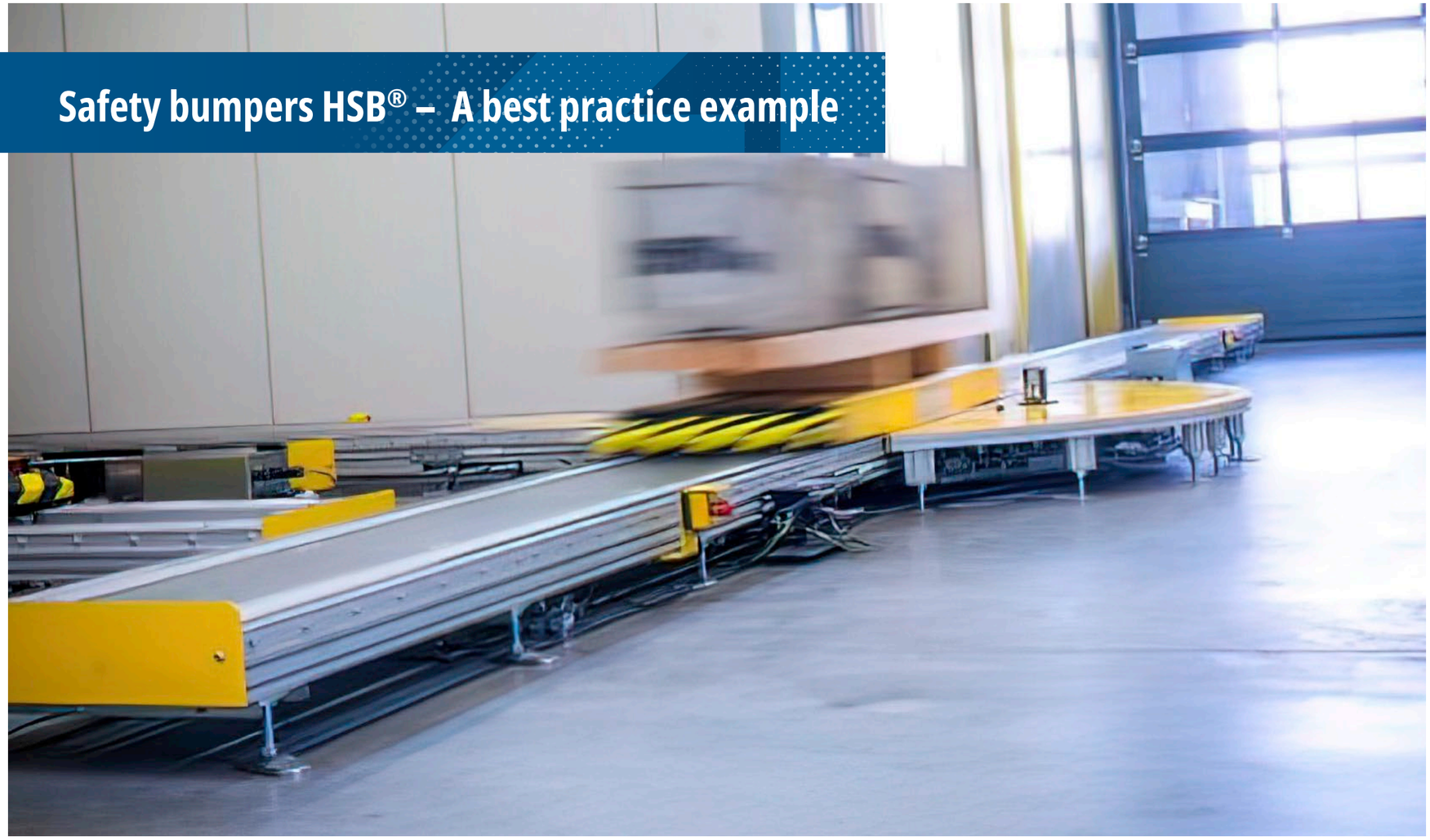


Customization – Personal support

If you have specific requirements that our standardised shapes, sizes, colours, or materials do not cover, we'll be happy to develop custom solutions for you.

Find your regional contact person here

Safety bumpers HSB® – A best practice example



Development of a custom safety bumper for **KRUPS:**

In assembly logistics, modern, driverless conveyor systems are used, which need to be secured to protect individuals from potential collisions. Standardized cross-sections and materials from HAAKE already secure a wide range of such applications. There are also special applications that require customized safety solutions in terms of dimensions, shape, colour, or material.

Our long-time partner, KRUPS Automation GmbH, for example, entrusted us with the development of a tailored solution to secure their LOGO!MAT eCarts. Watch the video to see how we successfully tackled the challenge and why the HAAKE Safety bumper minimizes impact and crush injuries from the eCart.

HAAKE bumper in use

Application area

Automated guided transport systems

Pressure sensitive protective devices| Safety bumpers HSB® | Best Practice

KRUPS SMART AUTOMATION

The intelligent conveyor system for assembly and test automation

LOGO!MAT eCart is a modern conveyor system with self-driving, intelligent workpiece carriers on a passive conveyor track. It is specifically designed for flexible assembly concepts in assembly automation and test automation, such as component assembly in electromobility. Thanks to its modular rail design, future expansions or conversions can be easily realized. The LOGO!MAT eCart conveyor system is Industry 4.0 capable and is characterized by low maintenance requirements, high availability, and high reliability.

For more **information** and **case studies**, please go to:

https://www.haake-technik.com/en/case-studies/

LOGO!MAT eCart: hydraulic lifting platform

LOGO!MAT eCart: rotating module with a HAAKE safety bumper

Safety mats HSM®

Comprehensive protection for danger zones

In areas where machines and equipment pose significant risks of injury to personnel, warning signs or markings are often insufficient. Here, HAAKE safety mats provide effective protection. They secure the danger zones that personnel are only allowed to enter when the machines or equipment are turned off.

Standard safety mat HSM®

Application areas (excerpt):

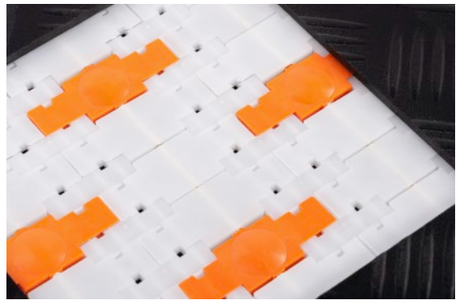
- Automatic machining centres and manufacturing systems
- Gantry milling machines
- Presses
- Automatic door and gate systems
- Systems and robots with freely accessible dangerous areas
- Aisleways in a warehouse

What are the safety mats HSM®?

Safety mats are sensitive protective devices that react immediately when they are stepped on by a person. When stepped on, the machine is shut down and placed in a safe operating state. As long as a person is on the safety mat, it is not possible to start the machine. HAAKE HSM® safety mats are used to secure large danger zones in facilities such as machining centres, gantry milling machines, presses, and robots.

Looking for a customised design?

Don't hesitate to ask us!
Phone: +49 (0) 2564 3965-0



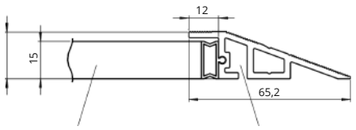
Detail presentation contact surface of the safety mat HSM

The functional principle and construction of safety mats

HAAKE HSM® safety mats are constructed based on the same principle as the Contact Chain® developed by HAAKE: they consist of mechanical, forced-opening contacts connected in series - in the form of a contact mat, where the conductive compact plates and insulating wedge elements are alternately lined up on an expander cord. Here too, the resting circuit is closed by compressing the contact elements with a defined preload.

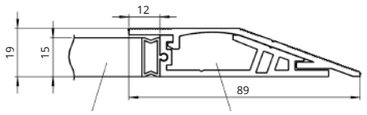
As soon as a person steps on the safety mat, at least one of the contact elements is separated, and the resting circuit is interrupted – the system stops. A stop signal is immediately generated, which is directly sent to the existing emergency stop module of the machine to be safeguarded. No transformation of the output signal is required.

Attachment profiles



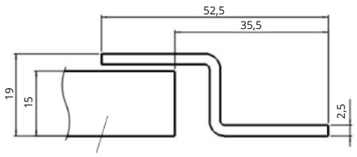
Schaltmatte HSM®

Space for cable installation



Safety mat HSM®

Space for cable installation

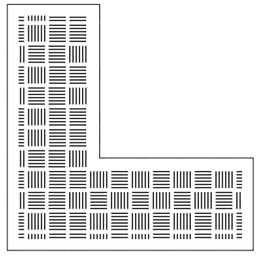


Safety mat HSM®

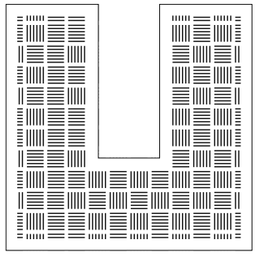
Material and surface

The tactile sensor is embedded in a polyurethane material. For added safety, the surface is coated with an anti-slip coating, and our safety mats are secured using aluminium mounting profiles. These profiles are customised to meet your specific requirements.

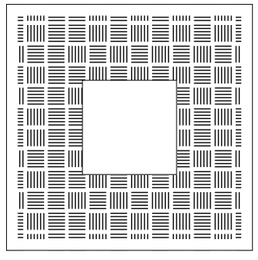
Feel free to inquire about customised products



L-shaped safety mats for use in corner areas.



Safety mat in a U-shape for systems against a wall



Safety mat for comprehensive protection of danger zones

As unique as your requirements

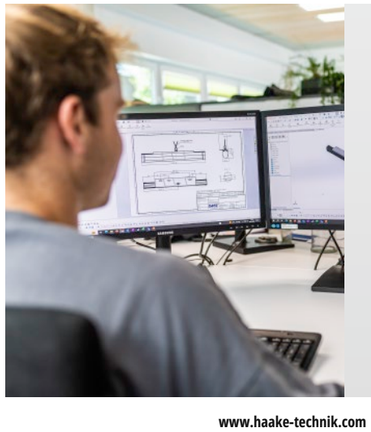
HAAKE safety mats are custom-configured to fit the specific requirements of your facilities and danger zones. This means that not only standard rectangular shapes are possible but also L-shaped, U-shaped, or other forms, as well as various sizes, materials, and surface textures. If you need to secure larger areas, multiple safety mats can be placed side by side.

We would be happy to work with you to develop the right concept for your needs. Just contact us!

Here is the link to the **data sheets**

Your benefits at glance

- **Enhanced safety for you:** HAAKE safety mats meet category 3 and performance level d requirements in accordance with DIN ISO EN 13849-1.
- **Extremely robust:** Thanks to the use of selected materials, HAAKE safety mats are suitable for harsh environmental conditions
- **Tailored to your needs:** Depending on your requirements, different dimensions and surface coatings are possible
- **Cost-saving:** Since the HAAKE Contact Chain® consists of open contacts, whose signals can be directly processed, there is no need for additional evaluation devices with costly connection and wiring work.
- **Conformity:** HAAKE safety mats are manufactured in accordance with the harmonised standards and therefore meet all requirements of Machinery Directive 2006/42/EC.
- **Easy installation:** HAAKE safety mats, including pre-processed frame profiles, are ready for installation. It is connected to the machine or system's existing emergency stop module, following the Plug & Play principle



Customization – Personal support

If you have specific requirements that our standardised shapes, sizes, colours, or materials do not cover, we'll be happy to develop custom solutions for you.

Find your regional contact person here

Safety mats HSM® - A best practice example

Developing custom safety mats for the **BMW Group:**

In the automotive industry, modern automated production lines are utilized, where the swift flow of automobile bodies to be manufactured is of paramount importance. To protect individuals against potential collisions with the conveyor system or semi-finished products, these automated production lines need to be safeguarded.

HAAKE Technik offers a variety of different contact mats, the configuration of which can be tailored to the specific requirements of each application. You can also find a custom-designed concept for securing the area of a production line using HAAKE safety mats (HSM) at the BMW Group Leipzig plant.

Application areas (excerpt):

Production lines | Conveyor

BMW GROUP Werk Leipzig

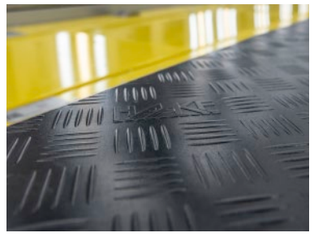
Area protection for a production line at the BMW Group Leipzig plant

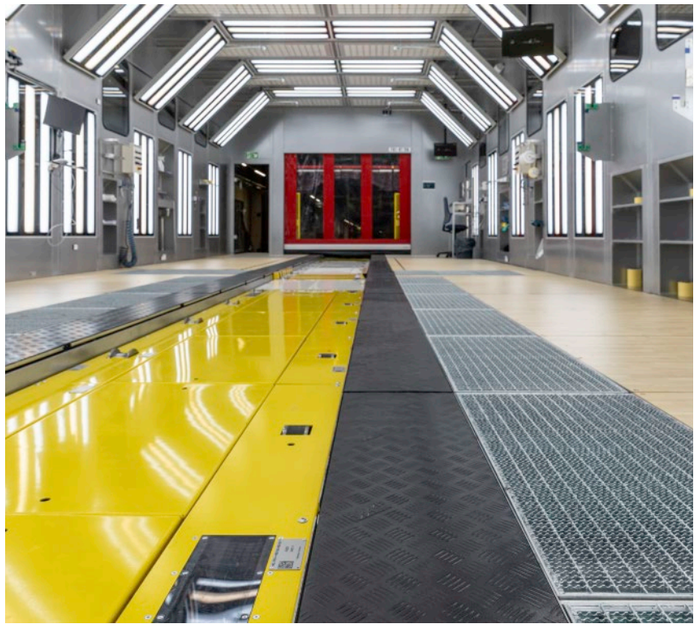
Every production line has its unique safety requirements, including the production line for automobile manufacturing at the BMW Group. An individually tailored concept for securing potential hazard areas was created by customizing HAAKE switching mats (HSM) to meet the specific needs of this customer. The tactile area protection provided by HAAKE safety mats ensures that when employees step on them, the production line comes to a halt, preventing collisions with the conveyor system or vehicle body. Conversely, the production line cannot be restarted as long as an employee is on the safety mat.

This principle of touch-sensitive sensors was perceived as an advantage over optical safety systems, as it eliminates the possibility of false triggers, such as detecting particles in the air.

For more **information** and **case studies**, please go to:

https://www.haake-technik.com/en/case-studies/





Other HAAKE Safety Solutions

Find more information about HST®/HSV® in our Downloads section

Trapped-key interlocking systems HST® – Safely controlling machines and processes

What are Trapped-key interlocking systems?

To ensure that hazardous equipment is turned off before anyone can approach it, trapped-key interlocking systems are employed. These systems ensure that a machine is turned off when a protective door is not closed, and vice versa, that a safety measure remains closed until the machine is turned off. The core of HAAKE Key Transfer Systems is a coded key that is interlocked between the shut-down device of a machine and its protective door, ensuring a secure lockout.

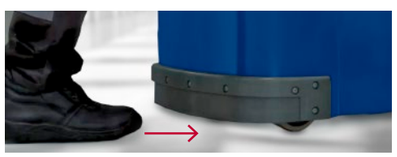
Valve interlocks HSV® – The key to system and process security

What are valve interlocks?

In many industrial production lines and energy networks, valves play a central role, including in oil and gas networks, pipelines, filling systems, and water supply facilities. When valves are opened or closed in the wrong sequence, it can lead to accidents and jeopardize the safety of many. HAAKE valve interlocking systems are easy-to-use locking systems that prevent accidents, protect materials, and ensure process safety by controlling the controlled opening and closing of valves.

Foot protection switch HFS-FS – Accident reduction when handling pallet trucks

Vehicle equipped with foot protection switch. Collision with foot detected. Vehicle stops. **1**



Vehicle equipped with foot protection switch. After collision and stop, the vehicle reverses. **2**

What is the Foot protection switch HFS-FS?

In the event of contact the Haake Foot protection switch provides a stop command to the control system of the pallet truck leading to the immediate stop and reverse of the machine. Thereby we significantly reduce the risk of accidents when handling industrial trucks and avoid long term accident-related absences and costs.

The Features

- ✓ Highly sensitive pressure sensor
- ✓ High robustness against mechanical influences
- ✓ Adaptability to almost any vehicle shape

Find more information about the Haake Foot protection switch in our Downloads section

- **Family business founded in 1987**
- **Continuous product development**
- **Internationally renowned for industrial safety technology**
- **Certified to ISO 9001, ISO 14001 and ISO 45001**
- **Global branches and sales partners**

Find your personal contact person

Haake Technik GmbH
Master Esch 72 . 48691 Vreden . Germany
Phone: +49 2564 3965-0 . Fax: +49 2564 3965-90
E-Mail: info@haake-technik.com

Subject to changes in content and illustrations.

www.haake-technik.com