Safety mats

Electrical surface switches for safe activation and deactivation of machines, devices and automatic doors

Reliable, robust, low-maintenance

- System is simple to install
- Surface switch for convenience and safety applications
- Especially robust due to full potting
- Standard and customer-specific designs available

www.bircher.com
Safety mats

Safety mats for safety and comfort applications

Safety

The safety mats from Bircher are used for detecting people or objects within a defined area. In conjunction with the EsMatix 3 safety switching device, they form a certified system for safeguarding danger zones, and thus for protecting people.

Convenience

Safety mats are characterised by their sturdy construction. They are available in a range of different shapes and designs. Directly connected to a controller, they are used as a switching element for convenient application.

Benefits for you

Universally applicable
- Maintenance-free
- Tailor-made for your requirements
- Easy to install
- Clearly visible
- Diverse shapes possible
- Surface structures and hardnesses can be selected
- Several switching zones are possible on one surface
- Individual mats, small batches and mass production

Functional principle

When anyone steps on the surface of the mat, or a load is placed on it, two parallel contact surfaces are pressed together and the electrical circuit is made.
Safety switching device EsMatix 3

- Performance level PL e, cat. 3 acc. to EN ISO 13849-1, in combination with a safety mat from Bircher
- Two inputs for connecting several safety mats
- Redundant safety output
- Monitoring output
- Automatic or manual reset
- Installation on DIN rail

In combination with the EsMatix 3 safety switching device, the Bircher safety mat is type-tested acc. to EN ISO 13856-1.

Reliable in every application

ESM-52/54
Standard shapes

Situation
Danger of injury due to moving machine parts

Solution
- Switch off a machine in the danger area

Benefits
- Robust standing surface with integrated safety switch
- Clearly visible
- Can be combined to protect larger areas

ESM-57
Special shapes

Situation
Automatic doors and locks

Solution
- Passage control and activation of revolving doors
- Individual passage at locks

Benefits
- Robust standing surface with integrated safety switch
- Several switching zones possible
- Individual shaping

EMP
Forklift mats

Situation
Forklift trucks

Solution
- Deactivation in case of unplanned exit from the operating platform

Benefits
- Robust standing surface with integrated safety switch
- Ergonomic, soft surface
- Vibration damping

ES-Button
Flat button

Situation
Machines and systems

Solution
- ES-Button flat button

Benefits
- Simply operate by hand, foot or with the arms
- Sturdy configuration for use in a contaminated and/or wet environment, or when subject to severe mechanical stress
Safety mats

ESM-52/54 safety mat – standard shapes: select L x W

Various sizes
The ESM-52 is available in eight different standard sizes (rectangular). The rectangular ESM-54, which is available with an active grip structure or with a smooth surface, can be used for special intermediate sizes. Both types can be laid both directly on the ground and under a floor covering such as a carpet.

Mat types ESM-52/54
You will find general technical data on safety mats as well as accessories on the last page.

<table>
<thead>
<tr>
<th>Types</th>
<th>ESM-52D</th>
<th>ESM-54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length x width</td>
<td>Customer-specific/8 defined sizes</td>
<td>L = Customer-specific</td>
</tr>
<tr>
<td>Thickness</td>
<td>Active grip structure 11.4 mm</td>
<td>Customer-spec.</td>
</tr>
<tr>
<td>Weight</td>
<td>Active grip structure 11.5 kg/m²</td>
<td>Customer-spec.</td>
</tr>
<tr>
<td>Number of cables</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Cable length</td>
<td>300 mm (ESM-52) or customer-specific (ESM-54), max. 5 m</td>
<td>300 mm incl. connector</td>
</tr>
<tr>
<td>Cable position</td>
<td>150 mm from edge (ESM-52), Side as shown in drawing, or customer-specific (ESM-54)</td>
<td>150 mm incl. connector</td>
</tr>
<tr>
<td>No-load resistance</td>
<td>&gt; 10 Mohm</td>
<td></td>
</tr>
<tr>
<td>Active switching edges</td>
<td>3 (ESM-52) or customer-specific (ESM-54)</td>
<td>Customer-spec.</td>
</tr>
<tr>
<td>Surface</td>
<td>See last page</td>
<td>Customer-spec.</td>
</tr>
</tbody>
</table>

Ordering information ESM-52
Type: ESM-52D
Dimensions: 211708 ESM-52D-1000X1000
211712 ESM-52D-1200X500
211713 ESM-52D-1200X750
211710 ESM-52D-1200X1000
211711 ESM-52D-1200X1250
211715 ESM-52D-1600X500
211716 ESM-52D-1600X750
211714 ESM-52D-1600X1000
Cable position: see graphic

Ordering information ESM-54
Type: ESM-54 with structure (A or D) or ESM-54G (smooth surface)
Dimensions: Length x width max. 1600 x 1000 mm or max. 1200 x 1200 mm; other sizes on request
Cable position: min. 10 mm from edge
Cable: 1 or 2 pcs., length, with/without plug connector AMP 6.3 mm, with/without integrated resistor
Safety mats

Safety mat ESM-57 – special shapes

Tailor-made for your requirements
Do you have a special application with individual dimension and functional requirements? The ESM-57 mat is produced in the size, shape and with the surface that you require. You also have the option to individually determine the position of the cable outlet and to integrate various active switching zones, which are highlighted in different colours.

Mat types ESM-57
You will find general technical data on safety mats as well as accessories on the last page.

ESM-57
Surface with grip pads (or without structure)

Types
- Length x width: Customer-specific
- Thickness: Active grip structure 11.4 mm, Without structure 10 mm
- Weight: Active grip structure 11.5 kg/m², Without structure 10.5 kg/m²
- Number of cables: Customer-specific
- Cable length: Customer-specific (max. 5 m)
- Cable position: Customer-specific
- No-load resistance: Customer-specific
- Active switching edges: 0–3
- Surface and colours: See last page

Safety mats are specifically adapted and produced according to your requirements. Our specialists will be happy to offer individual advice.
**Developed for use on electrically driven vehicles**

The EMP mat is installed on the standing platform of the vehicle and is primarily a surface switch that detects the presence of a person. The vehicle is stopped if the driver leaves the standing platform. This avoids serious accidents, injury to people and damage to property. It is therefore impossible to drive the vehicle from outside the operator’s position in vehicles which are not designed for such a function, thereby guaranteeing safe vehicle operation.

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**ESM-Presence mat types**

You will find general technical data on safety mats as well as accessories on the last page.

**EMP**

Surface with grip pads (also without structure)

Customer-specific

Types

The EMP forklift mats are specifically developed and tailor-made in line with your requirements.

This means that the outline, dimensions, surface structure, mat strength, hardness, size and position of additional switching zones, as well as the number and position of cable outlets are freely configurable in many areas.

The cable connections can be fitted with the plug connectors of your choice. The customer-specific surface offers an optimum and therefore secure grip. The soft mat offers protection against harmful vibrations, safeguarding the driver’s health.

In combination with presence detection, additional zones for foot-switch functions can be integrated into the EMP forklift mats and highlighted in different colours.

Thanks to the tailor-made solution, the mat is adapted perfectly to your industrial truck. Our specialists will be happy to offer individual advice.
ES-Button

ES-Button flat button

Application
ES-Button is a flat button used to control different machine functions. Regardless of whether a door is to be opened by an impulse, or an application is to be started, ES-Button is the interface between man and machine.

Benefit
Mounted horizontally or vertically, it can be easily actuated by hand, foot or arm. The extremely robust design allows it to be used in a contaminated as well as in a moist environment, where it is subject to heavy mechanical loads.

Dimensions

- Active switching zone
- Marking for the mounting hole (max. 6 mm diameter)

Activation options

- By hand
- By foot
- By arm

Technical data

- Dimensions: 150 x 150 x 15 mm
- Material: Polyurethane black/yellow
- Weight: 0.25 kg
- Application temperature: +5°C to +50°C
- Protection class: IP 67
- Loading capacity: 48 V, 0.1 A
- Response power: 35 N (typical)
- Response travel: 0.5 mm
- Switching contact: Potential-free NO contact
- Cable type: DM cable 2 x 0.5 mm²
- Cable length: 5 m

Ordering information

<table>
<thead>
<tr>
<th>Article no.</th>
<th>Designation</th>
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<tbody>
<tr>
<td>210970</td>
<td>ES-Button flat button</td>
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<tr>
<td>150 x 150</td>
<td>with 5 m cable</td>
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<tr>
<td>211006</td>
<td>ES-EC-5</td>
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<tr>
<td>211005</td>
<td>Extension cable 5 m</td>
</tr>
<tr>
<td></td>
<td>ES-EC-10</td>
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<tr>
<td></td>
<td>Extension cable 10 m</td>
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Ordering information (supplementary articles)

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<th>Description</th>
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<td>209310</td>
<td>ES-RR</td>
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<tr>
<td>209305</td>
<td>ES-ZT</td>
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<td>210973</td>
<td>ES-CC</td>
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<td>211968</td>
<td>ES-RC</td>
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<td>211723</td>
<td>ES-MK</td>
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<td>211969</td>
<td>ES-RE-8k2</td>
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<td>210975</td>
<td>ES-CS-1150</td>
</tr>
<tr>
<td>210976</td>
<td>ES-CS-1550</td>
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</tbody>
</table>

Active grip structures
In the ESM-54/57, it is possible to select from the following structures:

- **Structure A**
  - Ø 25 mm, distance 29.5 mm
  - Grip pad height 1 mm

- **Structure D**
  - Ø 23 mm, distance 25 mm
  - Grip pad height 1.4 mm

- **Structure G**
  - Smooth surface

Colours
In the ESM-54/57, it is possible to select from the following colours:

- Yellow
- Orange
- Grey
- Black

Switching devices
See also switching devices brochure

<table>
<thead>
<tr>
<th>Article no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>364283</td>
<td>EsMatix 3</td>
</tr>
<tr>
<td>364284</td>
<td>EsMatix 3.D</td>
</tr>
</tbody>
</table>

Technical data

**Safety mats**

- **Material**: Polyurethane (PUR)
- **Material hardness**: 55 ±5 Shore A / 80 ±5 Shore A
- **Colours**: Black, Grey, Yellow, Orange
- **Dimensions (length x width)**:
  - Max. 1600 x 1000 mm
  - Max. 1200 x 1250 mm
  - Min. 200 x 200 mm (smaller on request)
- **Manufacturing tolerances**:
  - Length and width: +1/–1.5 mm
  - Thickness: ±1.5 mm
  - All other dimensions acc. to DIN ISO 2768-C
- **Ambient temperature**:
  - –25°C to +70°C (operation and storage)
- **Loading capacity/vehicle capacity**:
  - – 1 x 2000 N/cm²
  - – 6000 x 2000 kg on fork lift truck roll 90 mm wide,
  - – 1 million x 1000 N with test object 80 mm acc. to standard EN ISO 13856-1,
  - – 5 million x 750 N with test object 80 mm, mat in combination with ES switching device
- **Voltage max. 48 V AC/DC**
- **Current max. 0.5 A**
- **< 5 ms, EsMatix 3 switching device**
- **Protection class**: IP 67 acc. to EN 60529
- **Insulating strength**: > 1500 V AC
- **Cable type**: 2 x 0.5 mm²
- **Cable length**:
  - Standard: 300 mm, with plug connector
  - Customer-specific: max. 5 m, without plug connector
- **Composition (> 1% by weight)**:
  - Polyurethane PUR (sealing compound)
  - Fibreglass epoxy resin (contact surface substrate)
  - Copper (contact surfaces, cables)
- **Standards**: Bircher safety mats correspond to PL e and cat. 3 acc. to EN ISO 13849-1 and are type-tested acc. to EN 13856-1
- **Chemical resistance of PUR**: Weather, ozone, oils, petrol, water 20°C, solvents, acids

**Note**

Technical details and recommendations concerning our products are based on experience and are an aid for the orientation of the user. Details stated in our brochures and data sheets do not guarantee special properties of the products. This does not apply to special product properties confirmed in writing or individually on a case-by-case basis. Subject to technical alterations.

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Application solutions with

Safety Mats

- High level of safety thanks to reliable technology
- Easy to install and pre-configured operating modes
- Comfort and safety for a variety of applications
Protection from moving parts in danger zones
The safety mat system protects the user from unintentional start-up due to external influence when filling the machine.

Protection around plants and dangerous machinery
The danger area is well marked out and easily recognised. A visible danger area ensures safety.

Protection from moving parts in danger zones
Particularly dangerous zones next to machinery can be secured selectively.

Safety security interlock to protect people
With two separated switching zones, the safety mat ensures that people are separated reliably.

Danger areas in cable cars and stations
Monitoring the door sills on entrances to means of transport ensures passenger safety.

Danger area around folding doors
Protection of danger points on folding doors located outside.
Any situation, any application
we have the right solution

Fork lift or industrial trucks
Presence detection of the user and further functions such as lifting and lowering of the platform are possible.

Transporting valuables
With their active switching zones, the tailor-made mats are ideal for separating people in the safety interlock area and for detecting valuable containers inside.

CareMat – Preventing falls in healthcare
The sensor mat provides valuable support to carers and is connected to the nurse call system. Falls can be prevented as soon as a person being cared for steps onto the mat, due to early assistance from the carer.

Colour, structure & form
The surface structures and colours can be chosen from existing designs or freely according to your requirements.
Your partner for comfort and safety

BBC Bircher Smart Access with its headquarters in Beringen, Switzerland, is the specialist for pressure-sensitive and contact-free sensor systems. We offer solutions for automatic doors and gates for public transport, industry and the care sector. Precious long-term and cooperative customer relations, expert know-how and ground-breaking innovations have been shaping our success for more than 50 years.

The staff at BBC Bircher Smart Access is fully committed to offer efficient and high-quality solutions for you on a daily basis.

Competent partners for our products are located in a large number of countries. Our specialists and authorised partners are very happy to offer personal advice and develop individual solutions with you.

An international contact overview can be found on our website at www.bircher.com