



STRUCTURAL PROTECTION MATS

Structural protection mats and safety-layers are permanently elastic products with high resilience for heavy load. They are produced from specified recycling-granulates. Therefore, they have a positive impact on the environmental protection.

Application Areas

These products are used in the areas of flat and green roofs, terraces, balconies, pavements and maintenance paths.

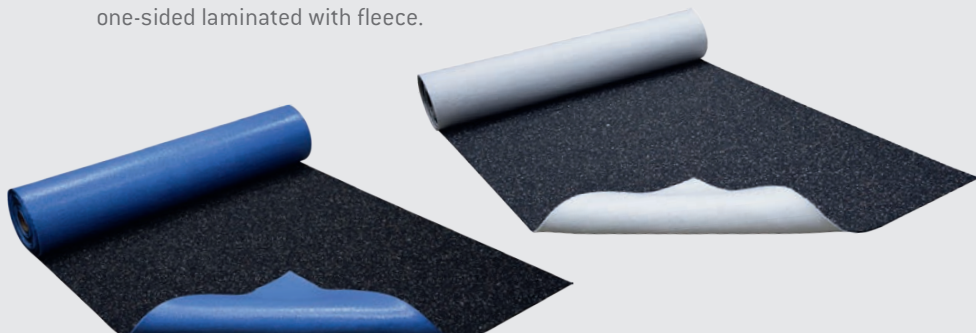
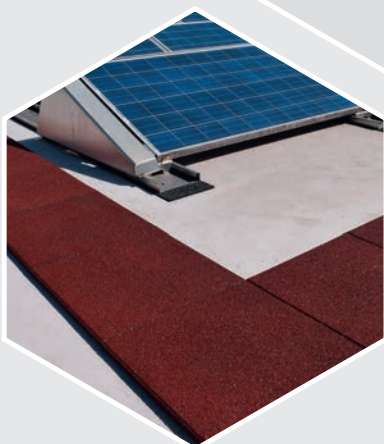


PHOTOVOLTAIC MATS

Photovoltaic mats TOP-PV and TOP-PLUS are structural protection mats for protection against mechanical damage on high-quality PVC seals as defined in DIN 18531-18535 and in the guideline for flat roofs. TOP-PV is used as a protecting underlay and ply separation for photovoltaic systems. TOP-PV features a composite film laminate on the underside as an integrated separating layer in case of incompatibility with the PVC roof waterproofing membranes. Please be advised that a consultation with the particular roofing membrane manufacturer is recommended. Additionally provided with a coefficient of friction $\mu \geq 0.6$ (laboratory measurement, metal on PVC roofing membranes [dry/new]). There is another product for this area, called TOP-PLUS, which is one-sided laminated with fleece.

Top-PV

Is used for protection against mechanical damages and as a separating for incompatibility with the PVC roof waterproofing membranes.



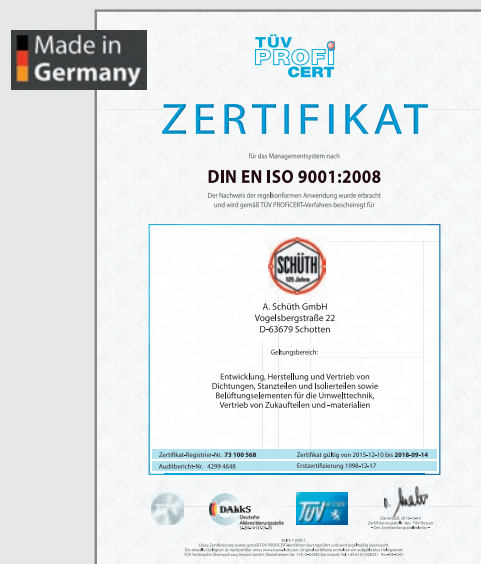


SCHÜTH – LOAD SECURING STRUCTURAL PROTECTION MATS – PHOTOVOLTAIC MATS

You want to know more about this product range of Schüth?

We will be pleased to advise you for your special applications. On enquiry,
we can offer a sampling, technical data sheets, test reports, etc.

Close cooperation with our customers is very important to us. Let us help
you to find solutions for your concerns.



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ANTI-SLIP MATS FOR LOAD SECURING



Structural Protection Mats – Photovoltaic Mats



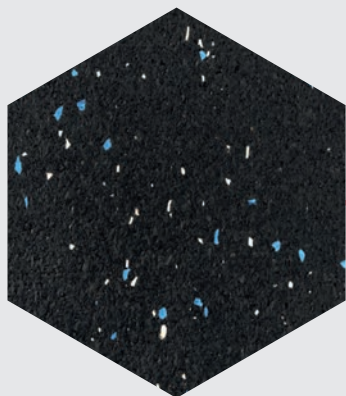
STORAGE, MANUFACTURING & PRODUCT SERVICE

As a large customer with different manufacturing equipment, the strengths of Schüth lays in the complete service regarding our product. We have inventories, which can be manufactured, packed, and delivered according to our customers' demands.

Whether you need rolls, stripes, cuttings, pads, adhesive or non-adhesive formats – Schüth's manufacturing equipment can produce every single form desired by the customer. We supply the sector of load security with our products ARM-SECURE, ARM-PROTECT, ARM-06-PLUS, ARM-BASIC, and an additional quality made of rubber material. For the sector of structural protection, we supply structural protection mats and safety-layers. The sector of photovoltaic is covered by our qualities TOP-PV and TOP-PLUS, which can be one-sided laminated with fleece. Upon your request, we can deliver your product in an adhesive or kiss-cut-version. We have thicknesses between 2.0 and 30.0 mm. For all our qualities, we can provide corresponding test certificates. In close cooperation with our partner, we provide products and service MADE IN GERMANY.



ANTI-SLIP MATS



ARM-Secure

Product for transportation of heavy load and high strain

Coefficient of sliding friction: min. $0.8 \mu^*$ at thicknesses of 8 and 10 mm

Tensile strength: min. 1.0 N/mm^2 (DIN EN ISO 1798)

Elongation at break: min. 80% (DIN EN ISO 1798)

Max. permissible compressive load: approx. 500 t/m^2 (VDI 2700 page 15)**

ARM-10

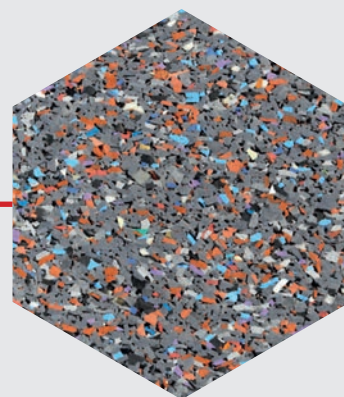
Standard product for high coefficient of sliding friction

Coefficient of sliding friction: min. $0.92 \mu^*$ at thicknesses of 3 to 10 mm

Tensile strength: min. 0.8 N/mm^2 (DIN EN ISO 1798)

Elongation at break: min. 120% (DIN EN ISO 1798)

Max. permissible compressive load: approx. 270 t/m^2 (VDI 2700 page 15)**



ARM-06-Plus

Standard product for medium-weight load and high surface pressure

Coefficient of sliding friction: min. $0.81 \mu^*$ at thicknesses of 3 to 10 mm

Tensile strength: 0.6 N/mm^2 (DIN EN ISO 1798)

Elongation at break: min. 60% (DIN EN ISO 1798)

Max. permissible compressive load: approx. 180 t/m^2 at 3 mm, 290 t/m^2 at 8 mm (VDI 2700 page 15) **

ARM-Basic

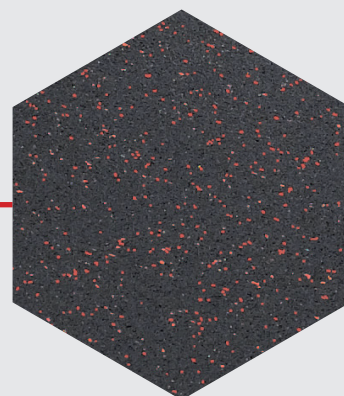
Standard product for high profitability

Coefficient of sliding friction: min. $0.7 \mu^*$ at thicknesses of 3 to 12 mm

Tensile strength: 0.6 N/mm^2 (DIN EN ISO 1798)

Elongation at break: min. 60% (DIN EN ISO 1798)

Max. permissible compressive load: approx. 100 t/m^2 at 3 mm, 120 t/m^2 at 8 mm (VDI 2700 page 15)**



ARM-100-65

Vulcanized rubber sheet

Coefficient of sliding friction: min. $0.6 \mu^*$ at a thickness of 2 mm

Tensile strength: 2.39 N/mm^2 (DIN EN ISO 1798)

Elongation at break: min. 191% (DIN EN ISO 1798)

Max. permissible compressive load: approx. 270 t/m^2 (VDI 2700 page 15)**

* Contact surfaces: wooden pallet, anti-slip textured lorry flooring, dry (acc. to VDI 2700 page 14)

** This technical data are not subject to an updating utility. Data sheets and certificates on request.

Responsibility
for the securing of the
load – the legal situation
is clear

LEGAL SITUATION

According to public law (Section 22 of the German Highway Code), the driver, the loader and the haulier are responsible for securing the load.

- The vehicle operator is obligated to equip the vehicle in accordance with Section 31 of the German Highway Code.

According to commercial law (Section 412 of the Uniform Commercial Code (UCC)) the dispatcher and carrier are responsible.

- According to Section 412 UCC the dispatcher is responsible for safe loading for transport.
- According to Section 412 UCC the dispatcher is responsible for safe loading for operation.

For quite some time now, VDI 2700 and DIN EN 12195 define the conditions under which a load is considered to be secured properly.



CALCULATION EXAMPLE

- Payload weight, 24,400 kg MDF sheets divided up and bundled into 8 packages
- Vehicle layout: Curtainsider L
- Friction partner smooth fiberboard/MDF sheet on non-slip floor $\mu = 0.2$
- Required lashing straps: 48 units with a preload force of 500 daN
- Lashing angle $\alpha = 80^\circ$
- Positive connection at the front

Costs without ARM ($\mu = 0.2$) – Calculation acc. to DIN EN 12195

48 lashing straps per transport operation (6 straps in each pack)
Procurement: € 10 / unit = € 480 ; 250 days = **€ 1.92**

Total per transport operation € 1.92

Truck downtime: **€ 80 / hr = € 218.40** per transport operation (168 mins.)
Fitting time per strap: approx. 2 mins. = 48 straps / transport operation = approx. **96 mins.**
Removal time (incl. rolling up) of each strap: 1.5 mins. = 48 straps per transport operation = **72 mins.**
At labour rates of € 30 / hr: **€ 84** per transport operation

Total per transport operation € 302.40

Edge protection brackets per transport operation: 96 units = 96 brackets \times € 0.50 = € 48 / annum
€ 48 : 250 days = **€ 0.19** per transport operation

Total per transport operation € 0.19

Costs with ARM ($\mu = 0.6$) – Calculation acc. to DIN EN 12195

16 straps per transport operation (2 straps in each pack to prevent lifting)
Procurement: € 10 / unit = € 160 ; 250 days = **€ 0.64**

Total per transport operation € 0.64

Truck downtime: **€ 80 / hr = € 80** per transport operation (60 mins.)
Fitting time per strap: approx. 2 mins. = 16 straps / transport operation = approx. **38 mins.**
Removal time (incl. rolling up) of each strap: 1.5 mins. = 16 straps per transport operation = **24 mins.**
At labour rates of € 30 / hr: **€ 30** per transport operation

Total per transport operation € 110.00

Edge protection brackets per transport operation: 32 units = 32 brackets \times € 0.50 = € 16 / annum
€ 16 : 250 days = **€ 0.06** per transport operation

Total per transport operation € 0.06

Costs anti-slip mats (15 strips, each 6 mm \times 200 mm \times 2500 mm)
€ 75 per truck for an average of 10 transport operations
Total per transport operation € 7.50

Laying out the anti-slip mats per transport operation approx. 5 mins.
At labour rates of € 30 / hr: **€ 2.50** per transport operation
Total per transport operation € 2.50

Costs per transport operation: € 304.51

Costs per annum (250 working days): € 76,127.50

Costs per transport operation: € 120.70

Costs per annum (250 working days): € 30,175.00

Saving for one truck per annum: approx. € 45,953.00