EPDM profiles for the railway industry

Sales Worldwide

The EMKA GROUP is world market leader for locks and latches, hinges and gasketing used in switch and control cabinets. The company is also among the leading manufacturers of locking technology in the fields HVAC technology and transport.

The company is represented in 46 countries employing more than 1,400 employees.

Wuppertal, Germany

Velbert, Germany

Middletown PA, USA

Birmingham, England

Bourré, France

Henriville, France

Arnedo, Spain

Tianjin, China

Goražde, Bosnia and Herzegovina

In-House Production

The range of products comprises more than 15,000 items. These are developed, manufactured, refined and assembled at nine production sites in Germany, France, UK, Spain, Bosnia and Herzegovina, US and China.

Fire protection included!

When it comes to fire protection applications in the railway industry, locking systems by EMKA are the first choice. The product range, that has specifically been developed for the railway industry, meets the special requirements of the sector and is designed to comply with the relevant standards such as DIN EN 45545-2.

It comprises outdoor as well as indoor applications for the railway vehicle construction.

The EMKA products for the railway industry excel at outstanding fire protection properties. They contribute to increase the safety of passengers and their ability to escape in case of fire hazards as well as to slow down smoke and heat generation.

References: Alstom, Bombardier, Deutsche Bahn, Siemens, Stadler, Voith, Vossloh

Fire protection profile black		
③	Self-gripping profile EPDM approx. 60° ± 5 Shore A sponge rubber EPDM	1011-05-FR01

Fire protection profile black		
③	Self-gripping profile EPDM approx. 60° ± 5 Shore A sponge rubber EPDM	1011-45-FR01

Fire protection profile black		
③	Self-gripping profile EPDM approx. 60° ± 5 Shore A sponge rubber EPDM	1011-51-FR01

EPDM profiles with fire protection

Highlights:

- Material is fire-protection tested according to DIN EN 45545-2
- In-house production, no bought-in goods
- Enhanced fields of application, e. g. on switch cabinets
- Individual customising of frames and rings on request

Fire protection standards:

① DIN 5510-2
② NF F 16-101/-102
③ DIN EN 45545-2
④ UNI CEI 11170
⑤ ASTM C542-90
⑥ ASTM E662-95
⑦ SMP 800-C

Tolerance of gaskets:
Gasket tolerance on the basis of DIN ISO 3302-1. Soft rubber usually according to “E2” and sponge rubber according to “E3”.
PVC edge protection profile tolerance on the basis of DIN 16941-3B.

Some examples:

Nominal dimension		Tolerance class DIN ISO 3302-1 E2	Tolerance class DIN ISO 3302-1 E3
over	up to		
0	1,5	±0.25	±0.40
1,5	2,5	±0.35	±0.50
2,5	4,0	±0.40	±0.70
4,0	6,3	±0.50	±0.80
6,3	10	±0.70	±1.00
10	16	±0.80	±1.30
16	25	±1.00	±1.60
25	40	±1.30	±2.00
40	63	±1.60	±2.50

Nominal dimension		Tolerance class DIN 16941-3B
over	up to	
0	3	±0.40
3	6	±0.60
6	10	±0.70
10	18	±0.80
18	30	±1.00

The appropriate storage is important (optimal storage temperature +5°C to +20°C).
For the storage of gaskets, attention should be paid to DIN 7716
(guidelines for storage, maintenance and cleaning of rubber products).
If possible, wrong storage in respect to long lay days or storing times should be avoided, since the mechanical characteristics may change.

Elastomers - operating temperatures and hardnesses:		
Materials	Operating temperatures	Hardness(±5° Shore A)
EPDM	approx. -40°C to 100°C	25° (MG) to 90° (WG)
NBR	approx. -30°C to 100°C	25° (MG) to 90° (WG)
CR	approx. -25°C to 100°C	40° to 90°
PVC	approx. -40°C to 70°C	55° to 75°
Silicone	approx. -60°C to 180°C	10° to 90°

MG=sponge rubber / WG=soft rubber

Recommended compression for extruded sealing profile:

The compression of our sealing profiles should be 50% max., since otherwise the function (tightness) and the restoring forces are affected. In practice, the profiles are compressed between 30-50%.
It does not matter, whether it is a EPDM, NBR or a silicone profile. Here, the mechanical properties are (unlike the chemical resistances) quite comparable. If the gasket is deformed beyond these limitations, there is the risk of the compression set (DVR) becoming too big, because the material deforms plastically as well.
Then the gasket would be designed too small.

Resistances:
Because of the large variety of possible chemicals, solvent (concentrations), operating temperatures and times, no evaluations concerning the possible resistances can be made at this point. In every individual case, a test in the present circumstances, like concentration, temperature and duration of the impact, is recommended.

Fire protection:
We supply materials certified according to the current fire protection standards for rail vehicles. E. g. according to DIN 5510-2; NF F 16-101/ -102; DIN EN 45545-2; UNI CEI 11170; ASTM-C and –E. Whether the achieved categories fit to the respective requirements or vehicle classes has to be verified for the individual case. Generally speaking, silicone profile achieve higher fire protection classes that EPDM.

Disclaimer:
As a rule, disclosed values are standard values detected on sample plates and correspond to our state of knowledge.
However, they do not release the end user of individual and thorough tests.

History:

The work on EN 45545 was finished in January 2012 for the time being.
DIN EN 45545 was published in June 2013 (available from August 2013).
The DOW (date of withdrawal) has been Extended from 6 to 36 months so that national standards, e. g. DIN 5510, are to be withdrawn by March 2016.

DIN EN 45545-2:

This part stipulates the test procedures for test conditions and requirements for the reaction to fire of each Hazard Level.

Hazard Level:

Operation category	Building class			
	N: Standard vehicles	A: Vehicles for automatic train operation not having staff on board that is trained for emergencies.	D: Double-decker trains	S: Sleepers and couchettes (bilevel or unilevel)
1	HL1	HL1	HL1	HL2
2	HL2	HL2	HL2	HL2
3	HL2	HL2	HL2	HL3
4	HL3	HL3	HL3	HL3

Operation categories:

Operation category 1: surface vehicles
Operation category 2: tunnel max. 5 km
Operation category 2: tunnel > 5 km
Operation category 4: tunnel, evacuation from the side not possible

Gasketing:

The gasketing has been included in DIN EN 45545 and have to meet the requirements R22 for indoors or R23 for outdoors as a function of the Hazard Level. In order to be able to define the Hazard Level, you need to know the Operation Category and Building Class, e. g. 2 (tunnel max. 5 km) D (double-decker trains)!

Note:

The compounds for the profiles are tested on test specimens of test plates according to the inspection specifications.

soft rubber:150 x 10 x 4 mm (oxygen content)
76 x 76 x 2 mm (smoke generation)

sponge rubber:150 x 10 x 4 mm (oxygen content)
76 x 76 x 2 mm (smoke generation)

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