

PRODUCT DATA SHEET

Sika Waterbar® - Elastomer Type FM, FMS

INTERNAL WATERBARS FOR JOINT SEALING IN WATERTIGHT CONCRETE STRUCTURES
ACCORDING TO DIN 7865-1/-2

PRODUCT DESCRIPTION

Sika® Waterbars Elastomer Type FM, FMS are permanently flexible waterbars made from SBR (styrene butadiene rubber) based as standard, for sealing expansion joints in watertight concrete structures. They are available in a range of different types, profiles and sizes to suit different types of structures and joint sealing applications.

USES

Application fields:

- Joint sealing in concrete structures
- Expansion joint sealing in insitu concrete construction
- Typical structures:
 - Commercial building basements
 - Underground car parks
 - Bridges, rail and road tunnels
 - Water treatment plants
 - Locks and weirs
 - Power stations
 - Barrages and dams

Application:

- Design and installation principles according to DIN 18197
- Jointing systems in accordance with DIN 18197 and DIN 7865

CHARACTERISTICS / ADVANTAGES

- High tensile strength and elongation
- High permanent flexibility and high resilience
- Suitable for high water pressure and stress
- Resistant to all natural mediums aggressive to concrete
- Resistant to a broad spectrum of chemical agents (testing necessary for any specific situations)
- Dimensionally stable in contact with penetration grade bitumen
- Robust sections for handling on site
- Vulcanizable for butt jointing the waterbars on site

APPROVALS / STANDARDS

Standards/Directives

- DIN 7865-1/-2
- DIN 18197
- WU-Directive DAfStb.
- ZTV-ING, RiZ-ING
- DS 804.6201 of DB AG
- Vulcanizing Instructions
- Vulcanizing Equipment Instruction Manual

Test Certificate /Approvals

- Certificate of Conformity DIN 7865
- External monitoring by MPA NRW
- Specified for joint sealing in civil engineering structures according to ZTV-ING, RiZ-ING and DB AG RiLi 804.6201
- Manufacturer's test certificate, other tests and approvals as required

PRODUCT INFORMATION

Chemical Base	SBR (Styrene Butadiene Rubber)
Packaging	<ul style="list-style-type: none">▪ Supplied as standard rolls of 20, 25 or 35 m dependent on profile, on euro or disposable pallets▪ Prefabricated formpieces supplied on euro or disposable pallets dependent on size
Appearance / Colour	Black
Shelf Life	The product does not expire if stored correctly
Storage Conditions	<p>Stored on the pallets as supplied on a flat base</p> <ul style="list-style-type: none">▪ For long-term storage > 6 months in enclosed areas: The recommendations of DIN 7716 apply. The storage area should be covered, cool, dry, free from dust and moderately ventilated. The Elastomer waterbars must be protected from heat sources and strong artificial lights with a high UV content▪ Short-term storage > 6 weeks and < 6 months in enclosed areas: The principles of DIN 7716 apply. On construction sites, outdoors: In dry storage, protected by suitable covers from direct sunlight, snow and ice, or any other form of contamination. Store separate from other potentially harmful materials, plant and equipment such as structural steel, reinforcements, fuels etc. Store away from traffic and site roads▪ Short-term storage < 6 weeks on construction sites, outdoors: Protected from contamination or damage. Protected by suitable covers from strong sunlight, snow or ice etc.▪ Vulcanizing materials should be covered and stored in a cool, dry area free from dust and contamination. It is recommended that the stock requirements be coordinated for a maximum storage period of about 6 weeks.

TECHNICAL INFORMATION

Shore A Hardness	62 ± 5 Shore-A	DIN 53505
Tensile Strength	≥ 10 MPa	EN ISO 527-2
Elongation	≥ 380 %	EN ISO 527-2
Tear Strength	≥ 8 N/mm	DIN ISO34-1: 2004-07
Chemical Resistance	Special stresses and exposures: For special stresses and exposures due to different temperatures and/or chemical mediums outside the substances or situations specifically defined in DIN 4033. Separate tests are always necessary. When required other materials are available in addition to the standard SBR.	
Service Temperature	For pressurised water	- 20°C to + 40°C
	For non pressurised water	- 20°C to + 60°C

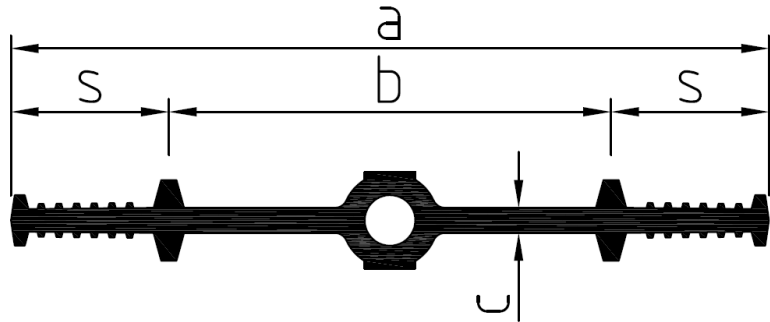
SYSTEM INFORMATION

System Structure

Forms

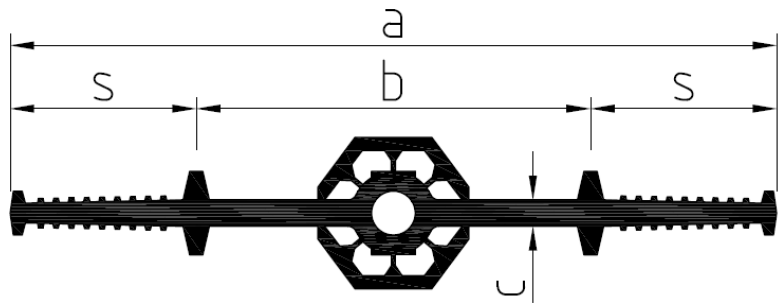
The limits of water pressure and stress given in the tables below apply to standard uses without specific additional testing.

Different values may be used when precise information on all of the relevant stresses and structural requirements are available.



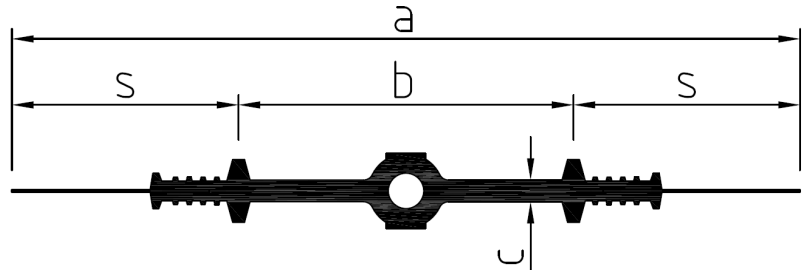
Total width (mm) a	Width of expansion part (mm) b	Thickness (mm) c	Width of sealing part (mm) s	Water pressure (bar)	Resulting movement Vr (mm)
FM 200					
200	110	9	45	0	25
FM 250					
250	125	9	62,5	0	25
				0,3	20
				0,5	10
FM 300					
300	175	10	62,5	0	35
				0,5	30
				1,2	20
FM 350					
350	180	12	85	0,5	45
				1,5	30
				2,0	20
FM 400					
400	230	12	85	0	45
				1,5	30
				2,0	20
FM 500					
500	300	13	100	0	50
				2,0	30
				2,5	20

Vr = Resulting movement $Vr = (v_x^2 + v_y^2 + v_z^2)^{1/2}$



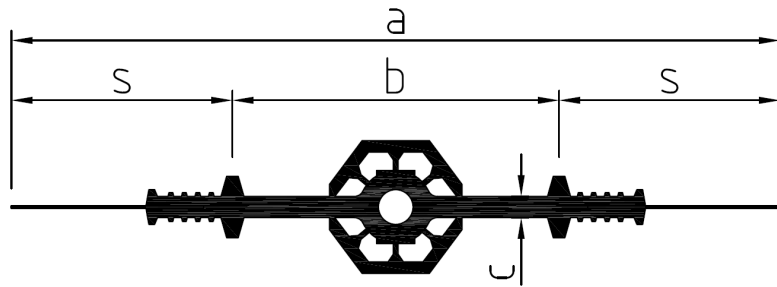
Total width (mm) a	Width of expansion part (mm) b	Thickness (mm) c	Width of sealing part (mm) s	Water pressure (bar)	Resulting movement Vr (mm)
FM 350 HS					
350	180	12	85	0	45
				1,5	30
				2,0	20

$$V_r = \text{Resulting movement } V_r = (v_x^2 + v_y + v_z^2)^{1/2}$$



Total width (mm) a	Width of expansion part (mm) b	Thickness (mm) c	Width of sealing part (mm) s	Water pressure (bar)	Resulting movement Vr (mm)
FMS 350 with lateral steel plates					
350	120	10	115	0	35
				0,5	30
				1,2	20
FMS 400 with lateral steel plates					
400	170	11	115	0	45
				1,5	30
				2,0	20
FMS 500 with lateral steel plates					
500	230	12	135	0	50
				2,0	30
				2,5	20

$$V_r = \text{Resulting movement } V_r = (v_x^2 + v_y^2 + v_z^2)^{1/2}$$



Total width (mm) a	Width of expansion part (mm) b	Thickness (mm) c	Width of sealing part (mm) s	Water pressure (bar)	Resulting movement Vr (mm)
FMS 400 with lateral steel plates					
HS					
400	170	11	115	0	45
				1,5	30
				2,0	20
FMS 500 with lateral steel plates					
HS					
500	230	12	135	0	50
				2,0	30
				2,5	20

Form FM / FMS ... HS with central hose sheathing are used for compression joints with shear stress or joints with a width $W_{nom} > 30\text{mm}$.

$V_r = \text{Resulting movement } V_r = (v_x^2 + v_y^2 + v_z^2)^{1/2}$

APPLICATION INSTRUCTIONS

APPLICATION METHOD / TOOLS

General:

As specified in DIN 18197 only butt joints can be done on site with Sika Waterbars Elastomer Type FM, FMS.

Prefabricated formpieces:

Standard formpieces (flat or vertical) for Sika Waterbars Elastomer Type FM, FMS include: Cross pieces, T-pieces, L-pieces.

Prefabricated formpieces help to reduce the required butt joints on site to a minimum.

Special formpieces:

Combined formpiece systems using combinations of different standard connections and profiles.

The standard maximum total length of formpiece systems is 20 m. Longer formpiece systems on request.

Handling

As specified in DIN 18197

- Careful transport and handling on site
- Installation only at waterbar material temperatures $\geq 0^\circ\text{C}$

- Protection is required until the waterbar system is fully cast in
- Special care must be taken of free waterbar ends
- Waterbars must be cleaned before casting in

Application

As specified in DIN 18197

- Internal waterbars are to be installed within the concrete section and clearance from the edge of the concrete being at least half the total width a of the waterstop

Detailed information on installation is given in the relevant Sika method statements and instructions for use. If there are very high stresses or difficult concreting conditions, the waterbars can be combined with injection hoses installed locally on the lateral anchoring ribs to additionally inject/grout the cast-in parts at a later date.

Jointing on site

The Sika Waterbars Elastomer Type FM, FMS are butt jointed together by vulcanization, i.e. with added rubber strips and the action of heat and pressure in a vulcanizing equipment with moulds dependent on the

waterbar profile used and longitudinal strain and specified vulcanizing parameters for the specific forms (temperature and time). Jointing with other vulcanizing agents without heat or using adhesives or adhesive tape is not permitted according to DIN 18197. Site joints must only be formed as stated in the vulcanizing instructions.

Requirement: Minimum ambient temperature + 5 °C and dry weather conditions. Site joints must be done only by trained and qualified personnel.

The key steps in the vulcanizing Sika Waterbars Elastomer Type FM,FMS are fully described in the detailed vulcanizing instructions.

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

ECOLOGY, HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data..

To select an appropriate protective equipment under www.sika.de our info datasheets are available: "General information on OSH" (Code 7510) and "General information on the wearing of protective gloves" (Code 7511).

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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Product Data Sheet

Sika Waterbar® - Elastomer Type FM, FMS
March 2020, Version 01.01
020703100500000111

SikaWaterbar-ElastomerTypeFMFMS-en-GB-(03-2020)-1-1.pdf