

PRODUCT DATA SHEET

Sika® Waterbar PVC-P NB

Range of PVC-P based, Non-Bitumen compatible, flexible waterbars for internal and external cast in place, expansion (movement) and construction joint waterstopping in new watertight concrete structures.

PRODUCT- DESCRIPTION

A range of flexible waterbars made from PVC-P NB (not compatible with bitumen), which are used for internal and external cast in place, expansion (movement) and construction joint waterstopping and sealing in new watertight concrete structures. Sika® Waterbar PVC-P NB waterbars are available in a range of different types, shapes and sizes to suit different types of structures and their joint waterstopping and sealing demands.

DESIGNATION

Sika® Waterbar PVC-P, NB

PRODUCT CHARACTERISTICS

- High tensile strength and elongation
- Permanent flexibility
- Suitable for medium levels of hydrostatic pressure and stress
- Resistant to all natural mediums in soil and groundwater that are aggressive to concrete, plus they are:
 - resistant to a broad spectrum of chemicals (testing is recommended for specific situations and chemical combinations)
 - suitable for thermal welding in shop and on site

PRINCIPLES FOR USE

The design and installation principles of Sika® Waterbar PVC-P NB waterstops are in accordance with German Standard DIN 18197.

USES

Watertight joint sealing in new concrete structures, including solutions for both movement (expansion) and construction joints.

Typical structures include:

- residential building basements
- commercial building basements
- underground car parks

STANDARDS / REGULATIONS

German Standard DIN 18197

German WU Directive DafStb

Sika® Waterbar PVC-P NB Welding Instructions and Method Statements / Installation Manuals

TESTING & APPROVALS

Manufacturer's test certificates provided, other certificates by agreement. Approved type as above standards.

PRODUCT DATA

MATERIAL	Thermoplastic Plasticized Polyvinyl Chloride PVC-P NB Material type NB: not bitumen resistant
COLOURS	Black for internally and externally placed waterstops Grey for FA waterstops for capping joints
PACKAGING	Standard rolls of 20 or 25 m length, dependent on the profile of the specific section, packed on Euro-pallets or disposable pallets. Factory produced, prefabricated Sika® Waterbar PVC-P NB waterstopping systems can be produced for specific projects and these are also supplied in coils, on Euro-pallets or disposable pallets dependent on their size
STORAGE CONDITIONS	The waterbars must be stored on pallets as supplied, on a sound, flat base.

For long-term storage ≥ 6 months

In enclosed areas

The storage area should be covered, cool, dry, free from dust and moderately ventilated. The Sika® Waterbar PVC-P NB waterstops must be protected from heat sources and natural or strong artificial lighting with a high UV content.

For short-term storage > 6 weeks and < 6 months

In enclosed areas:

- As for long-term storage above.

On construction sites outdoors:

- In dry storage conditions, protected by suitable covers from direct sunlight, snow and ice, or any other form of contamination
- Store separately from any potentially harmful or damaging materials, plant or equipment such as structural steel, steel reinforcement, fuel or vehicles etc.
- Store away from trafficked areas and roads on site to avoid damage

For short-term site storage ≤ 6 weeks before installation

On construction sites, outdoors:

- Protected by suitable covers from contamination or mechanical damage, strong direct sunlight, snow or ice etc.

MECHANICAL

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Identification no.: E 4007

PROPERTIES

SHORE-A HARDNESS	75 ± 5	DIN 53505
TENSILE STRENGTH	≥ 8 MPa	EN ISO 527-2
ELONGATION AT BREAK	≥ 275 %	EN ISO 527-2
TEAR PROPAGATION RESISTANCE	≥ 12 N/mm	ISO34-1
REACTION TO COLD ELONGATION AT BREAK	At -20°C ≥ 150 %	EN ISO 527-2
REACTION AFTER	a) Storage in saturated lime water b) Heat ageing c) Impact of microorganisms d) Weathering Allowable average value change ^{a)} Tensile strength ≤ 20% Elongation at break ≤ 20% Elastic modulus ≤ 20% ^{a)} Relative to the initial value	DIN 53508 EN ISO 846 EN ISO 4892-2 EN ISO 527-2
WELDABILITY	(Division of the tensile strength with welded seams by the tensile strength without seams) ≥ 0.6	DIN 18541-2
REACTION IN FIRE	Class E	EN ISO 11925-1 EN 13501-1

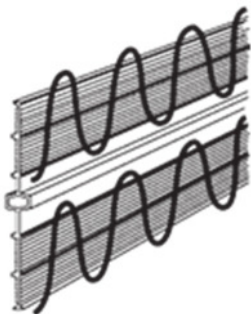
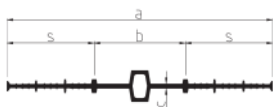
TYPES

The limits of water pressure and stress gives in the tables below apply to standard applications without any specific additional testing being required. Different values may be used when precise information on all of the relevant stresses and structural requirements is available.

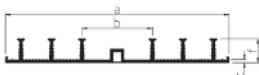
MOVEMENT (EXPANSION)

PVC- P NB type	Total width	Widt h of move	Thick ness	Widt h of roll	Roll lengt	Wa- ter Re- sultin
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JOINT WATERSTOPPING TYPES



D ... SF



Type	a	b	c	s		p	v
	[mm]	[mm]	[mm]	[mm]	[m]	[bar]	[mm]
D 19	190	75	3,5	58	25	0	10
D 24*	240	85	4	78	25	0,24	20
D 32*	320	110	5	105	25	0,8	25
D 50	500	155	6	173	25	0,96	30
D 25/6	250	120	6	65	25	0,29	20
D 32/6	320	170	6	75	25	0,96	25
D 32/9	320	120	9	100	25	1,2	25
SFD 24**	240	85	4	78	25	0,1	25
SFD 32**	320	100	4,5	105	25	0,3	25
OM 25	250	75	6	88	25	0,24	30
OM 35	350	95	6	128	25	0,8	35
OM 50	500	190	7	155	25	0,69	40
Sealing ribs N [1] x f [mm]							
DF 19	190	92	3,5	4 x 16	25	0	10
DF 24*	240	90	4,5	4 x 20	25	0 ¹⁾	25
DF 24/2	240	90	4,5	4 x 25	25	0,16	20
DF 24/3	240	104	5	4 x 35	20	0,16	20
DF 32*	330	104	4,5	6 x 20	25	0 ¹⁾	25
DF 32/2	330	104	4,5	6 x 25	25	0,24	20
DF 32/3	330	104	5	6 x 35	20	0,56	30
DF 50	500	124	4,5	8 x 20	25	0 ¹⁾	35
DF 50/2	500	124	4,5	8 x 25	25	0 ¹⁾	35
DF 50/3	500	124	5	8 x 35	20	0,8	20

* Stock product ** Waterstop according to DIN 18541-2

1) Specific project-related information

v Resulting movement = $(vx^2 + vy^2 + vz^2)^{1/2}$

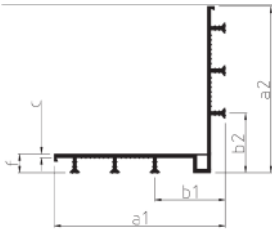
N Number of sealing ribs with DA and FA

f Height of profile (height of sealing ribs incl. baseplate)

**MOVEMENT (EXPANSION)
JOINT WATERSTOPPING
TYPES**

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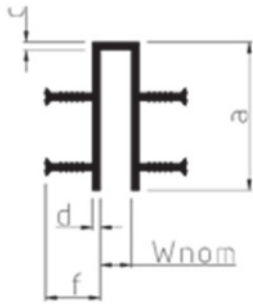
A = Sealing ribs, external
W = Sealing ribs, alternating

Type	PVC-NB type	Total width	Width of movement part	Thickness of movement part	No. of sealing ribs x Profile height	Roll length	Water pressure	Resulting movement
		a1/a2	b1/b2	c	N x f		P	vr
		[mm]	[mm]	[mm]	[1]x[mm]	[m]	[bar]	[mm]
External	DF 24 Angle A	146/131	71/55	4,5	4 x 20	25	0 ¹⁾	15 ¹⁾
	DF 24 Angle W	146/131	71/55	4,5	4 x 20	25	0 ¹⁾	15 ¹⁾
	DF 32 Angle A	192/176	79/63	4,5	6 x 20	25	0 ¹⁾	15 ¹⁾
	DF 32 Angle W	192/176	79/63	4,5	6 x 20	25	0 ¹⁾	15 ¹⁾

* Stock product ** Waterstop according to DIN 18541-2

- 1) Specific project-related information
 v resulting movement = $(vx^2 + vy^2 + vz^2)^{1/2}$
 N number of sealing ribs with DA und FA
 f Height of profile (height of sealing ribs incl. baseplate)

CAPPING JOINT WATERSTOPPING TYPES



Type	PVC-P NB type	Total width	Joint width	Thickness of cover plate or waterbar leg	No. of sealing ribs Profile height	Roll length	Water pressure	Resulting movement
		a	w nom	c / d	N x f		p	v _r
		[mm]	[mm]	[mm]	[1]x[mm]	[m]	[bar]	[mm]
	FF 5/2	50	10	5	2 x 25	25	0	20
	FF 5/2/3	50	10	5	2 x 35	25	0	20
	FF 5/3 *	50	20	5	2 x 25	25	0	20
	FF 5/3/3 *	50	20	5	2 x 35	25	0	20
	FF 7/2 P	70	10	10	2 x 25	25	0	40
	FF 7/3 *	70	20	5	2 x 45	25	0	40
	FF 7/5 *	70	40	5	2 x 45	25	0	40
	FF 10/3 *	95	20	5	4 x 25	25	0,1	20
	FF 10/3/3	95	20	5	4 x 35	25	0,1	20
	FF 14/4 **	140	30	5	4 x 35	25	0,1	30
	FF 14/6 **	140	50	5	4 x 35	25	0,1	30
	FF 14/3 *	140	20	5	6 x 25	25	0,3	20
	FF 14/3/3	140	20	5	6 x 35	25	0,3	20

* Stock product ** Waterstop according to DIN 18541-2 Installation of waterstops for capping joints with the trapezoidal strip TFL, see accessories.

- for joint width 10 mm: TFL 20
- for joint width 20 mm: TFL 30
- for joint width 30 mm: TFL 40
- for joint width 40 mm: TFL 50

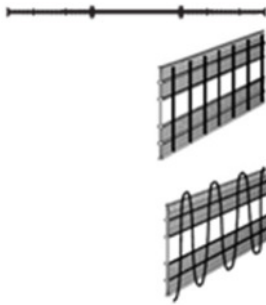
CONSTRUCTION JOINT

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WATERSTOPPING TYPES

A ... FIX

A ... SF

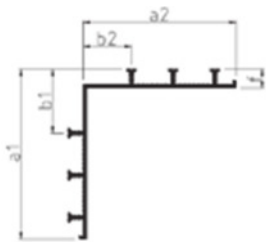
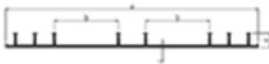


AF



AF 65/3

For construction joints with low centres of ca. 20 cm, e.g. on false ceilings



A = Sealing ribs, ext.

I = Sealing ribs, int.

W = Sealing ribs, alt.

Type	PVC-PNB Type	Total width	Width of movement part	Thickness of movement part	Width of sealing parts	Roll length	Water pressure	Resulting movement
		a	b	c	s		p	vr
	Type	[mm]	[mm]	[mm]	[mm]	[m]	[bar]	[mm]
internal	A 19	190	75	3	57,5	25	0	3
	A 24 *	240	85	3	77,5	25	0,24	
	A 32	320	110	4,5	105	25	0,8	
	A 50	500	155	6	172,5	25	0,96	
	FIX 20	200	70	3,5	65	25	0	
	FIX 24 *	240	80	3,5	80	25	0,24	
	FIX 32 *	320	100	4	110	25	0,8	
	SFA 20 **	190	75	3	62,5	25	0	
	SFA 24 * **	240	70	3,5	85	25	0,1	
	SFA 32 **	320	110	5	105	25	0,3	
External	Sealing ribs N x f [1] x [mm]							
	AF 19	190	92	3,5	4 x 16	25	0	3
	AF 24 *	240	90	4	4 x 20	25	0 ¹⁾	
	AF 24/2	240	85	4	4 x 25	25	0,16	
	AF 24/3	240	104	5	4 x 35	20	0,16	
	AF 32 *	330	104	4,5	6 x 20	25	0 ¹⁾	
	AF 32/2	330	104	4,5	6 x 25	25	0,24	
	AF 32/3	330	104	5	6 x 35	20	0,56	
	AF 50	500	124	4,5	8 x 20	25	0 ¹⁾	
	AF 50/2	500	124	4,5	8 x 25	25	0 ¹⁾	
	AF 50/3	500	124	5	8 x 35	20	0,8	
	AF 65/3	650	165	6	6 x 35	20	0,7	
		a1/a2	b1/b2					
	AF 24 Angle A	136/120	61/45	4,5	4 x 20	25	0 ¹⁾	
	AF 24 Angle W	136/120	61/45	4,5	4 x 20	25	0 ¹⁾	
	AF 24 Angle I	136/120	61/45	4,5	4 x 20	25	0 ¹⁾	
	AF 32 Angle A	181/165	68/52	4,5	6 x 20	25	0 ¹⁾	
	AF 32 Angle W	181/165	68/52	4,5	6 x 20	25	0 ¹⁾	
	AF 32 Angle I	165/165	52/52	4,5	6 x 20	25	0 ¹⁾	

* Stock product ** Waterstop according to DIN 18541-2

1) Specific project-related information

v resulting movement = $(vx^2 + vy^2 + vz^2)^{1/2}$

N number of sealing ribs with DA and FA

f Height of profile (height of sealing ribs incl. baseplate)

WATERBAR PVC-P NB WATERSTOPPING

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PRODUCT SELECTION

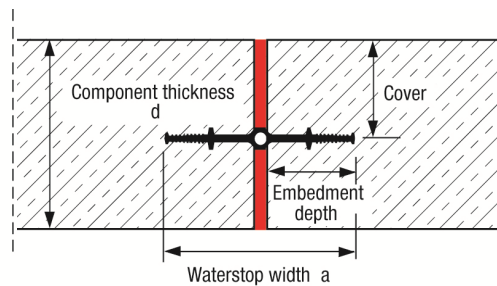
WATER PRESSURE / E / COVER DEPTH / STRESS

The data in the above tables on water pressure and the resulting stress provides the general application range in which the Sika® Waterbar PVC-P NB types can be used without additional testing. Shear strains in the 'y' direction (i.e. transverse to the waterstop) are limited to the dimensions of the nominal joint width w_{nom} without additional measures being taken.

If the water pressure and/or resulting strain value is to be exceeded, the values applicable to the waterstop should be specified on the basis of specific references, calculations or tests i.e. with suitable allowances for all of the actual influences and stresses anticipated on the specific project and application.

RULE OF COVER DEPTH

Internally placed Sika® Waterbar PVC-P NB waterstops:
Concrete cover \geq embedment depth or
Total waterbar width $a \approx$ Concrete component thickness

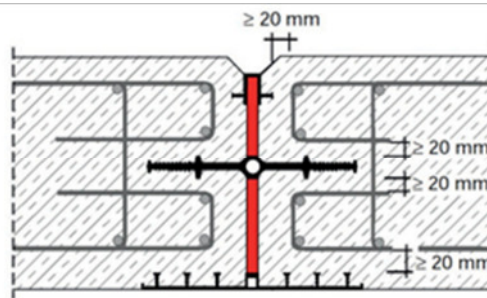


Externally placed Sika® Waterbar PVC-P NB and capping joint waterstops can be selected without considering the concrete cover and the component thickness.

ANCHORAGE DEPTH

The anchorage depth/concrete cover of the Sika® Waterbar PVC-P NB anchor ribs/sealing ribs must be 30 mm minimum.

REINFORCEMENT CLEARANCE



NOMINAL JOINT WIDTHS

The nominal joint width is:

Internal movement (expansion) joint waterbars $w_{nom} = 20$ or 30 mm

External movement (expansion) joint waterbars $w_{nom} = 20$ mm

For a greater nominal joint width or compression joints subject to shear stress, internal expansion waterbars with encased central bulbs must be used.

TEMPERATURE RANGE

The service temperature (Sika® Waterbar PVC-P NB temperature) is:
- For pressurised water: -20°C to $+40^{\circ}\text{C}$,

- For non-pressurised water: - 20°C to + 60°C.

ADDITIONAL STRESSES AND EXPOSURES

EXPOSURE TO DIFFERENT TEMPERATURES AND CHEMICAL AGENTS

For any additional stresses or exposure to different temperatures and/or chemicals outside of the substances or situations specifically defined in German Standard DIN 4033, then specific additional testing is always required.

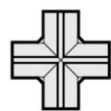
SYSTEM DATA

GENERAL

Only transverse butt joints should be formed by welding on site with Sika®® Waterbar PVC-P NB waterstops, all of the other junctions and joints should be produced with prefabricated sections. These are available from our factory in many different configurations and detailing sections, in order to reduce the number of joints requiring to be formed on each site to a minimum.

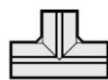
FACTORY PRODUCED JOINTING PIECES

The special factory produced sections and systems can be prefabricated for specific projects and the standard joint detailing sections for internal and external Sika®® Waterbar PVC-P NB systems include all of the following:



flache Kreuzung

Cross piece flat



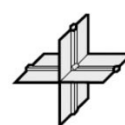
flaches T-Stück

T-piece flat



flache Ecke

L-piece flat



senkrechte Kreuzung

Cross-piece vertical



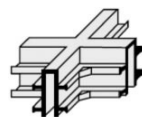
senkrechtes T-Stück

T-piece vertical



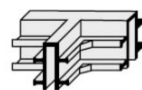
senkrechte Ecke

L-piece vertical



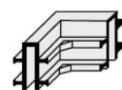
senkrechte Kreuzung

Cross-piece vertical



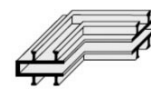
senkrechtes T-Stück

T-piece vertical



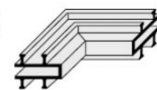
senkrechte Ecke

Angle vertical



flache Ecke, Kreuzung

Flat angle cross-piece



flache Ecke, Deckplatte innen

Flat angle internal cover plate

Production of these profiles is preferably made in 90° sections, or in standard internal or external angles of 60° - 175° as required on the project. Non-standard joints:

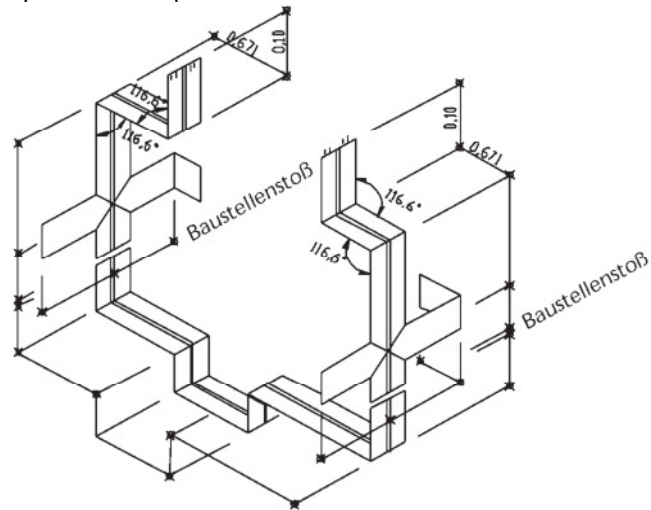
Several of these different prefabricated jointing pieces can be combined into specific prefabricated junctions for complex project requirements on request.

In the standard approach these preformed jointing pieces and junctions are supplied wherever possible and practical, already welded and built into larger sections of the complete water-stopping system. The sizes of the

various system components are dependent on the types of Sika® Waterbar PVC-P NB waterstop involved and the type and number of joints required.

The total recommended maximum length of Sika® Waterbar PVC-P NB systems is up to 25 m (including all the separate component lengths).

Example of a prefabricated Sika® Waterbar PVC-P NB joint waterstopping system build-up.



Site joint configuration

HANDLING

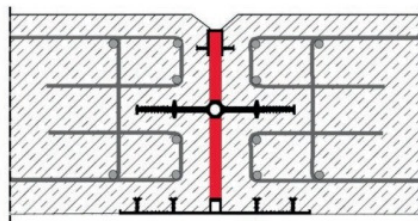
As detailed in German Standard DIN 18197, all waterbars require:

- careful transport and handling on site
- installation at ambient and waterbar material temperatures $\geq 0^{\circ}\text{C}$
- protection until the water-stopping system is fully cast in the concrete
- special care to be taken with the waterbar / waterstopping system ends
- that the waterbars are cleaned before being cast in concrete

INSTALLATION INSTRUCTIONS

INSTALLATION

As specified in German Standard DIN 18197.



- Internal Sika® Waterbar PVC-P NB waterstops are installed within the concrete sections and clearance from the edge of the concrete must be at least half the total width 'a' of the waterbar.
- External Sika® Waterbar PVC-P NB waterstops are installed flush with the external face of the concrete. Do not install this type of waterbar on the top surface of horizontal or only slightly sloping concrete.
- Sika® Waterbar PVC-P NB waterstops for capping joints are installed within the joint, set back by the dimension of the joint edge / arris chamfer.

If there are very high exposure stresses in service, or difficult concreting

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conditions during construction, then the Sika® Waterbar PVC-P NB waterstopping systems can also be supplied with integrated injection hoses, in order to allow future injection/grouting around the cast-in parts at a later date, if and when required.

**JOINTING ON SITE:
SITE BUTT JOINTS**

The thermoplastic Sika® Waterbar PVC-P NB waterbars and their detailing / jointing pieces are connected as butt-joints by hot air welding. The welding edges are melted in the process and fused permanently together whilst in the plastic state. Jointing the Sika® Waterbar PVC-P NB sections together with adhesives is not permitted.

All on-site welded joints must be formed as stated in the Sika® Waterbar PVC-P NB welding instructions.

Environmental Requirements: A minimum ambient temperature of + 5°C and dry weather conditions are required for welding on-site.

The welding equipment used must allow a weld over the full cross-section of the waterstop, be temperature controlled and allow controlled and measured pressure to be applied.

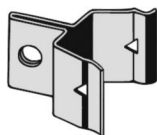
Site welded joints must only be formed by trained and qualified personnel. The key steps for this on-site jointing and complying with the Sika® Waterbar PVC-P NB welding instructions are:

- 1) Cut the Sika® Waterbar PVC-P NB ends, straight and square
- 2) Butt joint welding with a Sika splicing iron, semi-automatic welding equipment SG 320 L, or in special situations with an axe-shaped welding tool.
The welding process: Align
Heat/melt
Change around
Join together
Cool (in ambient temperature - Do not use coolant)
- 3) Inspect and protect the welded seams as necessary

After cooling for about half an hour the joint is normally finished and may be fixed / installed / stressed as required to continue with the installation. Further steps may be necessary dependent on the joint requirements and the type and dimensions of the Sika® Waterbar PVC-P NP waterstopping system. All welding work is subject to the relevant local Health and Safety regulations.

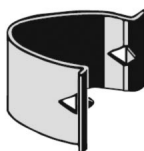
Please see the separate documents: Sika® Waterbar PVC-P NB Welding Instructions and the Sika Waterbar PVC-P NB Method Statement / Installation Manual for further information.

Waterbar fixing clips



Größe 1

Clip Type 1



Rundklammern

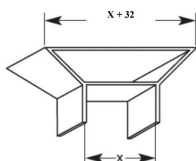
Circlips



The waterbar fixings should be installed at maximum 25 cm centres and fixed to the steel reinforcement.

TFL installation strip

for secure installation of waterstops on/at capping joints



Injection option

- Injection hose SikaFuko® VT 1, VT 2 or SikaFuko® Eco-1
- Circlip 16/18 (for SikaFuko® VT 1 and waterbar type D/A)
- Circlip 22 (for SikaFuko® VT 2 and waterbar type D/A)

These should be fixed approximately every 12.5 cm.

The requirements and installation guidelines for the specific type and size of hose and injection materials used, must always be followed when assembling, installing and grouting the injection hoses.

Stoppers

To plug the injection hose at the free waterstop ends (DIN 18197, section 5.2.1) use the profiled cord supplied in metre lengths.

Cut the cord on site into sections of about 10 cm as 'stoppers' and insert to a depth of about 5 cm by turning and pressing.

If the ends are to remain open, the overhang should be cut off.

If the ends remain temporarily free, the 'stoppers' must be removed before the butt jointed connection is formed.

Clamping brackets

To join internally placed construction joint waterstops together or join internally placed construction joint waterstops with a metal waterstop use:

Sika® Metal Waterbar KS 24: for joint waterstops a = 240 mm

Sika® Metal Waterbar KS 32: for joint waterstops a = 320 mm



IMPORTANT INFORMATION

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 the product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.
HEALTH AND SAFETY INFORMATION	For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.
LEGAL NOTES	This information and, in particular, the suggestions relating to the application and end-use of our products, are based on our knowledge and experience in normal use, providing the products have been properly stored and applied. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of results achieved or liability arising out of any legal relationship whatsoever, can be inferred either from this information or from any advice offered by spoken word, unless we have been deliberately at fault or guilty of gross negligence. The user shall be required to prove that he has duly and in full extent submitted to Sika in writing all information necessary for Sika to make a fair and proper assessment. The user must test the products` suitability for the intended application and purpose. Sika reserves the right to change the product specifications. The proprietary rights of third parties must be observed. Orders are accepted subject to our current terms and conditions of sale and delivery. The most recent edition of the Product Data Sheet shall apply, copies of which should be requested from us.

Sika Deutschland GmbH
Flooring / Waterproofing
Kornwestheimer Straße 103-107
70439 Stuttgart
Deutschland

Telefon: +49 711/8009-0
Telefax: +49 711/8009-321
E-Mail: info@de.sika.com
www.sika.de

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