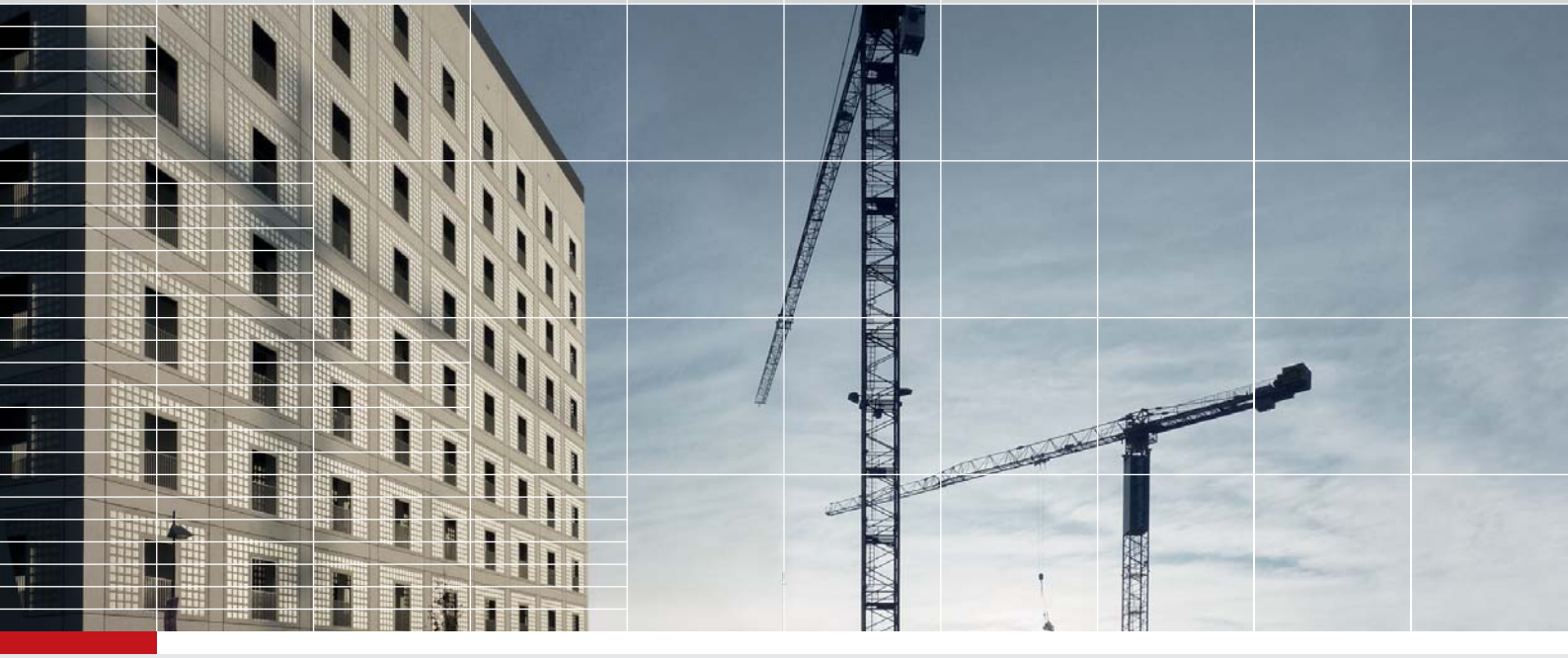
50 YEARS EXPERIENCE

FRANK | Technologies for the construction industry



Product List

valid as of April 1, 2012

FRANK®

TECHNOLOGIES FOR THE CONSTRUCTION INDUSTRY

For 50 years, the FRANK Group has been developing, producing and distributing new products for the construction industry. Our product portfolio is divided into five business units: spacers, formwork technology, reinforcement technology, sealing technology, and building acoustics. FRANK has two production facilities in Germany with a further four located outside Germany. FRANK is represented in 13 further countries with its own subsidiaries and daughter companies.
Basic principles such as fairness and integrity characterise the corporate culture of the family-managed FRANK Group.

On the internet at www.maxfrank.com, you will additionally find:

- Product information
- Test certificates and approvals
- Tender specifications
- CAD details
- Dimensioning software

FRANK peca EGCO

Title image: Stuttgart City Library | Title image: Peter Scheerer

www.maxfrank.com

Spacers

Formwork Technologies

Reinforcement Technologies

Sealing Technologies

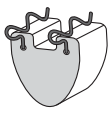
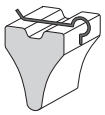
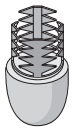
Building Acoustics

Spacers are used to ensure that the specified cover to the reinforcement in concrete structures and structural elements is maintained both before and during concreting.

Extruded fibre concrete – the optimum material combination with in-situ concrete

- High compressive strength, no deformation in heat or cold, concrete cover accurately maintained.
- Spacers remain in position during formwork erection and concreting.
- Ideal for impermeable concrete, no hairline cracks between the spacer and the concrete
- Tested according to DBV fact sheet “Spacer – version from January 2011” of the German Concrete Association
- KOMO certificate - our cement-bound spacers are certified according to the Dutch assessment directive BRL2817

We offer you the ideal spacer for every application:

	without wire	with wire	with steel clip	with cross-clip	with shuttlecock
Type series	**AO**	**AD**	**AK**	**AK-Q**	**AB**
Drawing					
Horizonal reinforcement	◯	⊕ [1]	⊖	⊖	⊕ ⊖
Vertical reinforcement	⊖	⊕ [1]	⊕ [1]	⊕ [1]	⊕ [1]
Exposed concrete [2]	⊖	⊕	⊕	⊕	⊕
Type group [3]	B1	B2	B2	B2	B2

⊕ suitable
◯ conditionally suitable
⊖ not suited

1) If tilting or displacement is not possible

2) Check the suitability of spacers for exposed concrete or self compacting concrete prior to use by testing at test surfaces.

3) Type group to DBV-instruction sheet “spacers”
B1 = point shaped, not fixed
C1 = linear shaped, not fixed
B2 = point shaped, fixed
C2 = linear shaped, fixed

You should consider the following when selecting spacers:

- Spacer selection information based on exposure classification in DIN EN 1992-1-1:2001-01 (Eurocode 2)
- Spacer selection information dependent on nature of structure and type of spacer used based on the DBV data sheet “spacers”.
- Required concrete cover according to EN206, paragraph 6.3 nominal measurement of concrete cover c_{nom}
- Spacer loading from the weight of reinforcement and additional loads e.g. foot traffic during concreting, fixing and erection work
- Diameter and location of the reinforcement – wall/slab
- Type of reinforcement – single bars or mats
- Simple, rapid and cost effective fixing
- Type of fixing – without tying wire, with tying wire, with steel or plastic clips
- External influences affecting the concrete, such as pressure, temperature, chemical attack, alternating moisture penetration, fire and corrosion
- Concrete surface finishing – stucco work
- Exposed concrete – the spacer imprint becomes visible on the concrete surface (kindly refer to DBV instructions sheet “exposed concrete”)

Spacer according to Eurocode 2

Spacers tested in accordance with the fact sheet “Spacers” 01/2011 of the German Concrete Association meet the requirements of DIN EN 1992-1-1:2011-01 (Eurocode 2) and are equipped with the following identification:

DBV – c – L2/F/T/A/D

These data mean:

General requirements

DBV This spacer fulfils the requirements of the present data sheet

c Laying dimension concrete cover c_v in mm

L Performance class L1 or L2

- **L1** = no requirements beyond norms with regard to load bearing capacity and toppling stability, e.g.: reinforcement not subject to foot traffic
- **L2** = Major requirements with regard to load bearing capacity and toppling stability – standard spacers for in-situ applications

Special requirements

F High resistance to freeze/thaw

T Suitable for construction elements exposed to extreme temperature conditions

A High resistance against water penetration and resistance against chemical attack and chlorides, see exposure classes XA, XD and XS

D Permissible steel diameter (only if applicable)

- Spacers with single cover, concrete cover 15 + 20 mm fulfils performance class L1:
  DBV – c – L1
- Spacers with single cover for concrete cover of 25 mm up fulfils performance class L2:
  DBV – c – L2
- Multiple cover spacers are certified based on the DBV data sheet but may not carry the DBV mark as they have two or three different concrete covers.

DBV-c-L/F/T/A certified products are marked in this product list.
Please ask for the corresponding test reports.

Required quantities and positioning

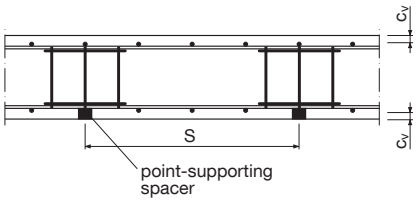
Thin rebar can bend during concreting!
If the reinforcement is very heavy, check the spacer loading capacity!

The fixing interval is based primarily on the accepted deflection at maximum loading, e.g. when the reinforcement is walked on, especially during concreting. When placing bar spacers in the tension zone of the component to be concreted, use spacers of reduced length and arrange them with overlaps.

Structural element: slabs

Spacer fixing distances S

Supported bars Ø	max. S	Pcs. required per m²			
		Single spacer	Bar spacers		
			L = 18 cm	L = 33 cm	L = 100 cm
up to 6.5 mm	0.50 m	4	3.0	2.5	1.33
from 6.5 mm	0.70 m	2	1.6	1.4	0.84



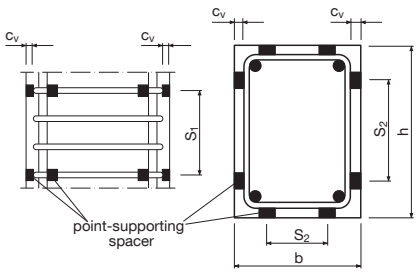
Structural component: beams and columns

Spacer fixing distances max. S_1 in longitudinal direction

longitudinal bars Ø	columns	beams
up to 10 mm	0.50 m	0.25 m
12 to 20 mm	1.00 m	0.50 m
over 20 mm	1.25 m	0.75 m

Spacer fixing distances max. S_2 in transverse direction

	Quantity, distances	
b or h	columns	beams
up to 1,000 mm	2 pcs.	2 pcs
over 1,000 mm	≥ 3 pcs.	≥ 3 pcs.
max. S_2	0.75 m	0.50 m

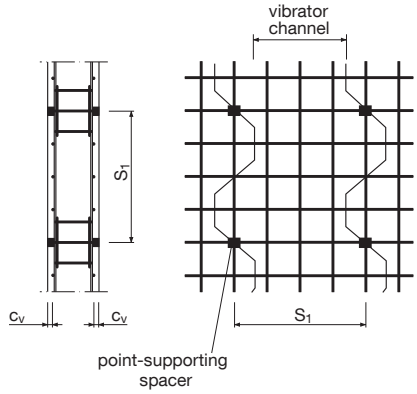


Structural element: walls

Spacer fixing distances S_1 and quantity

supporting bars Ø	max. S_1	Pcs. required per m² wall*		
		Single spacer	Bar spacers	
			L = 18 cm	L = 33 cm
up to 8 mm	0.70 m	4	1.6	1.4
over 10 mm	1.00 m	2	1.0	0.8

*and per wall side



Spacers without tying wire

made of fibre concrete for horizontal reinforcement

	Art. no.	Concrete cover mm	Cut width mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	BAO15*	15	24	2.00	1250	1020
	BAO20*	20	24	2.70	750	830
	BAO25*	25	24	3.30	600	812
	BAO30*	30	24	3.60	600	884
	BAO35*	35	24	4.50	500	920
	BAO40*	40	24	5.68	400	929
	BAO45*	45	24	6.70	250	690
	BAO50*	50	24	7.50	250	770
	AO2501*	25	20	3.60	500	740
	AO3001*	30	20	4.60	500	940
	AO3512*	35	24	6.20	400	1012
	AO4012*	40	24	8.10	250	830
	AO4512*	45	24	8.50	250	870
	AO5013*	50	28	11.60	200	948
	AO5513*	55	28	13.10	175	937
	AO6013*	60	28	14.30	175	1021
	AO1561	15/20	20	2.70	750	830
	AO2561	25/30	24	4.50	500	920
	AO3562	35/40	24	6.80	250	700
	AO4562	45/55	24	11.40	200	932
	AO5062	50/60	24	12.00	200	980
	AO2071	20/25/30	20	2.80	750	860
	AO3572	35/40/50	24	9.30	250	950
	AO4572	45/55/60	24	15.00	125	770

Packaging: 40 sacks per pallet.
* Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.
Further dimensions up to concrete cover 100 mm available upon request.

Spacers with tying wire

made of fibre concrete for horizontal and vertical reinforcement

	Art. no.	Concrete cover mm	Cut width mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	BAD15*	15	24	2.00	1250	1020
	BAD20*	20	24	2.80	750	860
	BAD25*	25	24	3.50	600	860
	BAD30*	30	24	3.80	600	932
	BAD35*	35	24	4.70	500	960
	BAD40*	40	24	5.95	400	972
	BAD45*	45	24	7.00	250	720
	BAD50*	50	24	7.80	250	800
	AD2501*	25	20	3.80	500	780
	AD3001*	30	20	4.40	500	900
	AD3512*	35	24	6.30	400	1028
	AD4012*	40	24	7.80	250	800
	AD4512*	45	24	8.80	250	900
	AD5013*	50	28	12.00	200	980
	AD5513*	55	28	13.40	175	958
	AD6013*	60	28	13.90	175	993
	AD1561	15/20	20	2.80	750	860
	AD2561	25/30	24	4.70	500	960
	AD3562	35/40	24	7.00	250	720
	AD4562	45/55	24	11.70	200	956
	AD5062	50/60	24	12.30	200	1004
	AD2071	20/25/30	20	2.90	750	890
	AD3572	35/40/50	24	9.60	250	980
	AD4572	45/55/60	24	15.30	125	785

Surcharge when supplied with galvanised or stainless tying wire – POA.
Packaging: 40 sacks per pallet.
* Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.
Further dimensions up to concrete cover 100 mm available upon request.

Spacers with steel clips

made of fibre reinforced concrete for vertical reinforcement

	Designation	Art. no.	Concrete cover mm	Cut width mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	bracket for steel up to Ø 8 mm	AK20RA	20	20	2.30	1000	940
		AK25RA	25	20	2.40	1000	980
		AK30RA	30	20	2.90	750	890
		AK35RA	35	20	3.50	500	720
	Fillet for steel Ø 10 + 12 mm, bracket for steel Ø 10 – 16 mm	AK30ZS	30	20	5.48	400	897
		AK35ZS	35	20	5.70	400	932
		AK40ZS	40	20	6.60	250	680
		AK45ZS	45	20	7.60	250	780
		AK50ZS	50	20	7.90	250	810
	Fillet for steel Ø 16 mm, bracket for steel Ø 10 – 16 mm	AK30ZSE16	30	20	6.57	250	677
		AK35ZSE16	30	20	8.41	250	861
		AK40ZSE16	40	20	8.90	250	910
		AK45ZSE16	45	20	7.30	250	750
		AK50ZSE16	50	20	9.20	250	756

Packaging: 40 sacks per pallet.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.

Spacers with cross-clips

made of fibre reinforced concrete for vertical reinforcement

	Designation	Art. no.	Concrete cover mm	Cut width mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	Groove for rebar from Ø 3 to 10 mm	AK30S5Q10	30	36	7.00	250	720
		AK35S5Q10	35	36	7.70	250	790
		AK40S6Q10	40	40	9.10	250	930
	Groove for rebar from Ø 12 to 16 mm	AK30S5Q16	30	36	7.00	250	720
		AK35S5Q16	35	36	8.10	250	830
		AK40S6Q16	40	40	9.00	250	920
		AK45S6Q16	45	40	10.70	200	876
		AK50S6Q16	50	40	11.20	200	916

Packaging: 40 sacks per pallet.
Tested according to DBV-data sheet “Spacers” (01/11) DBV-c-L/F/T/A.

Spacers with bevel cut for washed-out concrete

made of fibre reinforced concrete for vertical reinforcement

	Designation	Art. no.	Clamp for steel diameter mm	Concrete cover mm	Cut width mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	Groove for rebar from Ø 4 to 6 mm	AK25WZ	4-8	25	20	2.10	1000	860
		AK30WZ	4-8	30	20	2.40	1000	980
		AK35WZ	4-8	35	20	2.90	500	600

Non-stock item. Delivery time on request.
Packaging: 40 sacks per pallet.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.

“Rondo” spacer

round spacers made of fibre concrete for insertion of prefabricated reinforcement cages into formwork

	Art. no.	Concrete cover mm	Cut width mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	RONDO03002512	30	25	21.80	110	979
	RONDO03502512	35	25	25.50	100	1040
	RONDO04002512	40	25	34.20	60	841
	RONDO04502512	45	25	42.00	60	1028
	RONDO05002512	50	25	60.20	40	983

For steel diameters of up to 12 mm.
Non-stock items. Delivery time approx. 5 working days. Packaging: 40 bags/pallet.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.

Spacers for fire protection reinforcement

made of fibre concrete to guarantee concrete cover for load and fire protection reinforcement in tunnel construction

	Art. no.	Concrete cover mm	Cut width mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	AO5020BS	50/20	24	12.00	200	980
	AO6020BS	60/20	24	13.00	175	930
	AD5020BS*	50/20	24	12.30	200	1004
	AD6020BS*	60/20	24	13.30	175	951

Concrete cover of fire protection reinforcement for steel mesh N94 and/or steel Ø 3 mm.
Packaging: 40 bags/pallet. Delivery time: approx. 5 working days.
* with binding wire, black annealed, for attachment to the load-carrying reinforcement.

Tunnel spacers

for fixing of sealing film in tunnel constructions

	Designation	Art. no.	Concrete cover mm	Weight kg/pce.	Sack contents pcs.	Sack/pallet	Weight kg/pallet
	From fibre concrete, contact surface 80 x 100 mm, round-shaped corners	FBTA50	50	0.50	–	–	–
		FBTA60	60	0.63	–	–	–
	Made of synthetic material, contact surface 60 x 68 mm	KTA50	50	0.06	200	24	298
		KTA60	60	0.07	200	12	188

Non-stock item, delivery time on request.

Tying wire

	Designation	Art. no.	Wire thickness mm	Pack size kg	Packaging unit/pallet	Weight kg/pallet
	Tying wire roll BR 1.4 black annealed	HSBDRS14	1.4	20	36	740
	Tying wire roll BR 1.4 galvanised	HSBDRV14	1.4	20	36	740
	Tying wire coil black annealed	HSBD1440	1.4	25-40	25	1020

Spacers for concrete pipe production

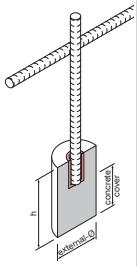
extruded fibre concrete

	Designation	Art. no.	Concrete cover mm	Cut width mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	transverse groove for rebar Ø 8 mm, clip for rebar Ø 6 mm	AK30Q3K*	30	28	8.80	250	900
		AK35Q3K*	35	28	9.50	250	970
		AK40Q3K*	40	28	11.10	200	908
		AK45Q3K*	45	28	12.60	175	902
		AK50Q3K*	50	28	13.20	175	944
	longitudinal groove for rebar Ø 6 mm, clip for rebar Ø 8 mm	AK30L10K*	30	55	7.50	250	770
		AK35L10K*	35	55	8.00	250	820
		AK40L10K*	40	55	9.00	250	920
		AK45L10K*	45	55	9.60	250	980
		AK50L10K*	50	55	10.10	250	1030

Transverse or longitudinal groove for steel Ø 8 – 10 mm can be supplied for all types.
Please state when ordering: e.g.: AK30Q3KE10 or AK30L10KE10.
Other dimensions upon request.
Packaging 40 bags per pallet or grid box.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.
* Non-stock items – delivery time upon request.

Reinforcement end supports

made of fibre concrete used as stands for vertical single rebars

	Designation	Art. no.	External Ø mm	Concrete cover mm	Height h mm	Weight kg/pce.	Sack contents pcs.	Weight kg/pallet
	suitable for rebar diameter: smooth: 5.0 – 8.0 mm; ribbed: 4.0 mm – 8.0 mm	FBSP5352506*	27	25	40	0.05	500	980
		FBSP5353006*	27	30	45	0.05	400	884
		FBSP5353506*	27	35	50	0.06	250	620
		FBSP5354006*	27	40	55	0.07	250	680
		FBSP5354506*	27	45	60	0.07	250	740
		FBSP5355006*	27	50	65	0.08	250	800
	suitable for rebar diameter: smooth: 6.0 – 10.0 mm; ribbed: 6.0 mm – 10.0 mm	FBSP53525	35	25	45	0.09	250	920
		FBSP53530	35	30	50	0.10	250	1020
		FBSP53535	35	35	55	0.11	200	900
		FBSP53540	35	40	60	0.12	200	980
		FBSP53545	35	45	65	0.13	200	1060
		FBSP53550	35	50	70	0.14	175	1000

Packaging: 40 bags per pallet.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.
* Delivery time: approx. 5 working days.

Kickers made of fibre concrete

acting as continuous stop spacers between shutters, square profiles 40 x 40 mm with 2 nail holes

	Art. no.	Length mm	Weight kg/pce.	Carton contents piece	Weight kg/pallet
	SAV400150	150	0.38	95	1303
	SAV400160	160	0.40	75	1100
	SAV400180	180	0.45	75	1235
	SAV400200	200	0.50	65	1190

36 boxes/pallet.
Further dimensions available upon request.
Delivery time approx. 5 working days.

Kickers made of fibre concrete

acting as stop spacers between shutters

	Designation	Art. no.	External Ø mm	Height h mm	Weight kg/pce.	Pack size piece
	without nail insert	SAR60	60	40	0.23	100
	with nail insert (without nail)	SAR60N	60	40	0.23	100
	Nail suitable for nail gun, shaft diameter 3.7 mm, shaft length 72 mm	SAFBRN72	–	–	0.01	100

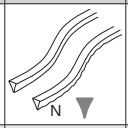
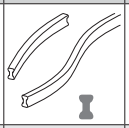
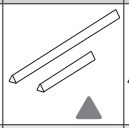
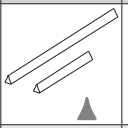
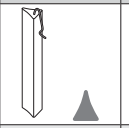
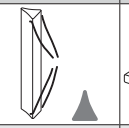
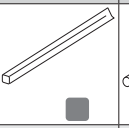
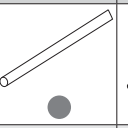
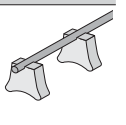
If nail guns are used, it is recommended that a trial installation is caried out to determine appropriate cartridge strength and tool settings on site in order to avoid damage to the kickers.

Bar spacers are used to ensure that the specified cover for concrete structures and structural elements is maintained, both before and during concreting.

Extruded fibre concrete – the optimum material combination with in-situ concrete

- High compressive strength, no deformation in heat or cold, concrete cover accurately maintained.
- Extremely suitable for impermeable concrete, no hairline cracks between the spacer and the concrete.
- Large support area – reduced pressure on the formwork
- Substantial labour cost savings due to rapid and simple laying
- Fire resistant to the highest requirements specified in DIN 4102 – Class 1A (non combustible).
- Tested according to DBV fact sheet “Spacer – version from January 2011” of the German Concrete Association
- KOMO certificate – our cement-bound spacers are certified according to the Dutch assessment directive BRL2817

We offer you the ideal spacer for every application:

	Snake, Snake N + Banana N	Rail + Rail B	Triangular	Triangular concave	Triangular concave with hook	Triangular concave with tying wire	Square	Round	Combined spacers
Type series	**FAHKS FAHKBN**	**FAHSS FAHSB**	**FAHD**	**FAHK**	**FAHDH**	**FAHKZD**	**FAHV**	**FAHR**	**KOMBI KOMBST**
Drawing									
Horizonal reinforcement	⊕ [1]	⊕ [1]	⊕ [1]	⊕ [1]	⊖	○	⊕ [1]	⊕ [1]	⊕
Vertical reinforcement	⊖	⊖	⊖	⊖	⊕	⊕ [1]	⊖	⊖	⊖
Exposed concrete [2]	○	⊖	⊖	⊖	○	○	⊖	○	⊕
Type group [3]	C1	C1	C1	C1	C2	C2	C1	C1	B1/C1

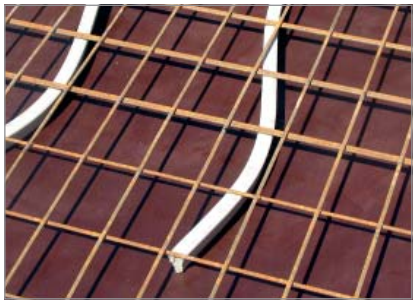
⊕ suitable
○ conditionally suitable
⊖ not suited

1) with longitudinal limitation when installed transversally to the main tension direction of the reinforcement (350 mm and/or ≤ 2 x h or ≤ 0.25 x b whereby h = component thickness and b = component width)

without length limitation:
- cement-bound spacers in the pressure zone
- when installing longitudinally to the main tension direction of the reinforcement
- within tension zone when the crack formation plays a tangential role and for components without any specific requirement regarding the appearance - see DBV fact sheet “Spacers” 01/2011

2) Check the suitability of spacers for exposed concrete or self compacting concrete prior to use by testing at test surfaces.

3) Type group to DBV-instruction sheet “spacers”
B1 = point shaped, not fixed
C1 = linear shaped, not fixed
B2 = point shaped, fixed
C2 = linear shaped, fixed



Suitable for rapid and cost effective fixing of mesh and loose reinforcement. Stable and non-tipping, simple laying.

"Snake" type bar spacers – Standard length: approx. 1000 mm

made from fibre concrete for support of horizontal mesh and loose bars

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHKS20100	20	0.57	1500	875
FAHKS25100	25	0.69	1000	710
FAHKS30100	30	0.85	1000	870
FAHKS35100	35	1.10	750	845
FAHKS40100	40	1.25	600	770
FAHKS45100	45	1.45	500	745
FAHKS50100	50	1.76	500	900
FAHKS55100	55	1.95	400	800
FAHKS60100	60	2.11	350	759

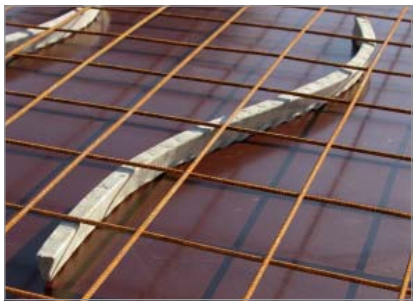
Other covers and lengths available upon request.
Tested according to DBV fact sheet "Spacers" (01/11) DBV-c-L/F/T/A for installation direction longitudinally to the main tension direction of the reinforcement.

"Snake" type bar spacers – Standard length: approx. 800 mm

made from fibre concrete for support of horizontal mesh and loose bars

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHKS20080	20	0.46	1500	710
FAHKS25080	25	0.55	1500	845
FAHKS30080	30	0.68	1500	1040
FAHKS35080	35	0.88	1000	900
FAHKS40080	40	1.00	750	770
FAHKS45080	45	1.16	600	716
FAHKS50080	50	1.41	600	866

Other covers and lengths available upon request.
Tested according to DBV fact sheet "Spacers" (01/11) DBV-c-L/F/T/A for installation direction longitudinally to the main tension direction of the reinforcement.



Contact with the formwork is reduced to a few points due to the notched contact surface. Designed for use with exposed concrete.

Suitable for supporting overlapping individual rebars

"Snake N" type bar spacers – Standard length: approx. 1000 mm

made from fibre concrete with notches for support of horizontal mesh and loose bars

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHKSN20100	20	0.50	1500	770
FAHKSN25100	25	0.70	1000	720
FAHKSN30100	30	0.86	1000	880
FAHKSN35100	35	1.20	750	920
FAHKSN40100	40	1.22	600	752
FAHKSN45100	45	1.44	500	740
FAHKSN50100	50	1.60	500	820
FAHKSN55100	55	1.95	400	800
FAHKSN60100	60	2.17	350	780

Other covers and lengths available upon request.
Tested according to DBV fact sheet "Spacers" (01/11) DBV-c-L/F/T/A for installation direction longitudinally to the main tension direction of the reinforcement.

"Snake N" type bar spacers – Standard length: approx. 800 mm

made from fibre concrete with notches for support of horizontal mesh and loose bars

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHKSN20080	20	0.40	1500	620
FAHKSN25080	25	0.56	1500	860
FAHKSN30080	30	0.69	1500	1055
FAHKSN35080	35	0.87	1000	890
FAHKSN40080	40	0.98	750	755
FAHKSN45080	45	1.15	600	710
FAHKSN50080	50	1.28	600	788

Other covers and lengths available upon request.
Tested according to DBV fact sheet "Spacers" (01/11) DBV-c-L/F/T/A for installation direction longitudinally to the main tension direction of the reinforcement.

Contact with the formwork is reduced to a few points due to the notched contact surface. Designed for use with exposed concrete.

Suitable for supporting overlapping individual rebars

"Banana N" type bar spacers – Standard length: approx. 330 mm, specially made for R mats

made from fibre concrete with notches for support of horizontal mesh

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHKBN2033	20	0.17	4050	709
FAHKBN2533	25	0.23	3375	796
FAHKBN3033	30	0.28	2700	776
FAHKBN3533	35	0.36	2160	798
FAHKBN4033	40	0.41	1890	795
FAHKBN4533	45	0.48	1350	668
FAHKBN5033	50	0.53	1080	592
FAHKBN5533	55	0.63	1080	700
FAHKBN6033	60	0.72	810	603

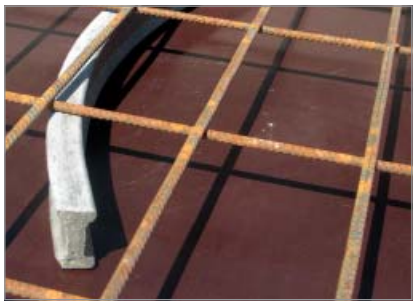
Packaging: loose on pallets, shrink-wrapped.
Other concrete covers available upon request. 10% surcharge for carton packaging.
Tested according to DBV data sheet "Spacers" (01/11) DBV-c-L/F/T/A.

"Banana N" type bar spacers – Standard length: approx. 250 mm, specially made for Q mats

made from fibre concrete with notches for support of horizontal mesh

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHKBN2025	20	0.13	5400	722
FAHKBN2525	25	0.18	4050	749
FAHKBN3025	30	0.22	3510	792
FAHKBN3525	35	0.27	2970	822
FAHKBN4025	40	0.31	2700	857
FAHKBN4525	45	0.36	2430	895
FAHKBN5025	50	0.40	2160	884

Packaging: loose on pallets, shrink-wrapped.
Other concrete covers available upon request. 10% surcharge for carton packaging.
Tested according to DBV data sheet "Spacers" (01/11) DBV-c-L/F/T/A.



- High load-bearing capacity
- Excellent bonding
- Protects formwork
- Rapid, efficient laying
- Secure application
- Technically accurate and cost effective

"Rail" type bar spacer – Standard length: approx. 1000 mm

made from fibre concrete for support of horizontal mesh and loose bars

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHSS30100	30	1.02	1000	1035
FAHSS35100	35	1.03	750	793
FAHSS40100	40	1.20	600	740
FAHSS45100	45	1.53	500	785
FAHSS50100	50	1.72	500	880
FAHSS55100	55	2.09	400	856
FAHSS60100	60	2.31	350	829

Packaging: pallet erected loosely, wrapped in film.
Delivery time: approx. 5 working days.
Tested according to DBV fact sheet "Spacers" (01/11) DBV-c-L/F/T/A for installation direction longitudinally to the main tension direction of the reinforcement.

"Rail B" type bar spacers – Standard length: approx. 330 mm, specially made for R mats

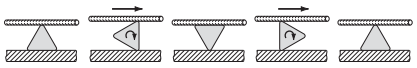
made from fibre concrete for support of horizontal mesh and loose bars

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHSB3033	30	0.29	3780	1116
FAHSB3533	35	0.34	2430	846
FAHSB4033	40	0.40	2160	884
FAHSB4533	45	0.51	1620	846
FAHSB5033	50	0.57	1080	640
FAHSB5533	55	0.69	1080	765
FAHSB6033	60	0.77	810	644

Packaging: loose on pallets, shrink-wrapped.
Delivery time: approx. 5 working days.
10% surcharge for carton packaging.
Tested according to DBV data sheet "Spacers" (01/11) DBV-c-L/F/T/A.
Other concrete covers available upon request.

Security in use

Triangular bar spacers always provide the same concrete cover in any position.



Triangular bar spacers – Standard length: approx. 1000 mm

made from fibre concrete with continuous reinforcing threads
for support of horizontal mesh and loose bars

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHD015100	15	0.37	2000	766
FAHD020100	20	0.61	1500	935
FAHD025100	25	0.99	1000	1010
FAHD030100	30	1.46	1000	1479
FAHD035100	35	1.77	750	1348
FAHD040100	40	2.85	500	1445
FAHD045100	45	2.77	400	1128
FAHD050100	50	3.68	350	1308
FAHD055100	55	4.20	300	1280
FAHD060100*	60	5.05	250	1283
FAHD070100*	70	6.88	200	1396

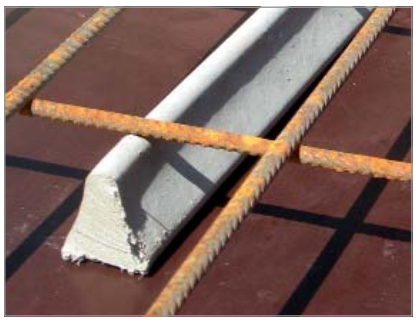
Other covers and lengths available upon request.
Tested according to DBV fact sheet “Spacers” (01/11) DBV-c-L/F/T/A for installation direction longitudinally to the main tension direction of the reinforcement.
* Non-stock items, delivery time upon request.

Triangular bar spacers – Standard length: approx. 330 mm

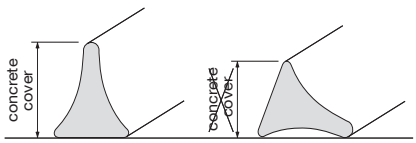
made from fibre concrete with continuous reinforcing threads
for support of horizontal mesh and loose bars

Art. no.	Concrete cover mm	Carton contents piece	Weight kg/carton	Cartons/pallet	Weight kg/pallet
FAHD015033	15	250	30.75	33	1035
FAHD020033	20	150	29.70	33	1000
FAHD025033	25	110	35.97	33	1207
FAHD030033	30	75	32.93	33	1107
FAHD035033	35	60	35.04	33	1176
FAHD040033	40	50	38.30	33	1284
FAHD045033	45	40	36.56	33	1226
FAHD050033	50	33	38.68	33	1296
FAHD055033	55	30	41.70	33	1396

Other covers and lengths available upon request.
Approved according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.



Always place flat side downwards when laying horizontally.



Triangular concave bar spacers are cost effective. If there is a likelihood that they will roll over, triangular bar spacers should be used.

Triangular concave bar spacers – Standard length: approx. 1000 mm

made from fibre concrete with continuous reinforcing threads
for support of horizontal mesh and loose bars – lightweight version

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHK025100	25	0.78	1000	800
FAHK030100	30	0.92	1000	940
FAHK035100	35	1.26	750	965
FAHK040100	40	1.55	600	950
FAHK045100	45	2.00	500	1020
FAHK050100	50	2.31	500	1175
FAHK055100	55	2.68	400	1092
FAHK060100*	60	3.05	350	1088
FAHK070100*	70	3.80	250	970
FAHK080100*	80	5.00	150	770

Other covers and lengths available upon request.
Tested according to DBV fact sheet „Spacers“ (01/11) DBV-c-L/F/T/A for installation direction longitudinally to the main tension direction of the reinforcement.
* Non-stock items, delivery time upon request.

- For vertical reinforcement
- Simply clip to reinforcement
- With continuous fibre reinforcement to prevent breakages

Fibre concrete triangular concave bar spacers with hook clips – Standard length: approx. 180 mm

made of fibre concrete for Q-mesh reinforcement and single bar reinforcement, mesh width up to 150 x 150 mm

Art. no.	Concrete cover mm	Carton contents piece	Weight kg/carton	Cartons/pallet	Weight kg/pallet
FAHDH20018	20	250	28.50	24	704
FAHDH25018	25	180	33.12	24	815
FAHDH30018	30	125	27.50	24	680
FAHDH35018	35	100	21.10	24	526
FAHDH40018	40	75	19.43	24	486
FAHDH45018	45	60	21.78	24	543
FAHDH50018	50	50	21.80	24	543
FAHDH55018	55	50	25.10	24	622
FAHDH60018	60	50	28.30	24	699

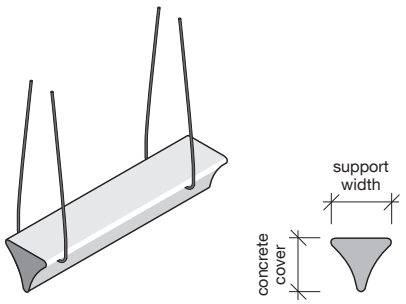
Standard length: approx. 330 mm

made of fibre concrete for vertical R mesh reinforcement and single bar reinforcement, mesh width 150 x 250 mm

Art. no.	Concrete cover mm	Carton contents piece	Weight kg/carton	Cartons/pallet	Weight kg/pallet
FAHDH20033	20	150	31.20	24	769
FAHDH25033	25	110	35.75	24	878
FAHDH30033	30	75	24.83	24	616
FAHDH35033	35	60	24.18	24	600
FAHDH40033	40	50	23.40	24	582
FAHDH45033	45	40	26.52	24	656
FAHDH50033	50	33	26.20	24	649
FAHDH55033	55	33	30.36	24	749
FAHDH60033	60	30	30.00	24	740

Clip type “PL” for steel Ø 10 – 16 mm.
Design with notches: 10% surcharge. Above prices include 1 steel hook clip.
Other covers and lengths available upon request.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.

- Secure fixing in any position, even with overhanging reinforcement (tunnel construction)
- Bar spacers for multiple rebars
- Non-tipping due to the large support width
- Equilateral shape and, thus, always the same concrete cover



Fibre concrete triangular concave bar spacers with two binding wires – standard length approx. 180 mm, equilateral shape

made of fibre concrete for secure fixing in any position

Art. no.	Concrete cover mm	Support width approx. mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHKZD300180	30	33	0.17	6000	1040
FAHKZD350180	35	39	0.23	4500	1055
FAHKZD400180	40	45	0.32	3400	1108
FAHKZD450180	45	50	0.40	2800	1140
FAHKZD500180	50	56	0.50	2400	1220
FAHKZD550180	55	61	0.57	2200	1274
FAHKZD600180	60	67	0.68	1850	1278
FAHKZD700180	70	79	0.91	1200	1112

Standard length approx. 330 mm, equilateral shape

made of fibre concrete for secure fixing in any position

Art. no.	Concrete cover mm	Support width approx. mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHKZD300330	30	33	0.31	3850	1214
FAHKZD350330	35	39	0.43	2800	1224
FAHKZD400330	40	45	0.58	2050	1209
FAHKZD450330	45	50	0.72	1750	1280
FAHKZD500330	50	56	0.90	1400	1280
FAHKZD550330	55	61	1.02	1200	1244
FAHKZD600330	60	67	1.22	1000	1240
FAHKZD700330	70	79	1.64	650	1086

Non-stock items. Delivery time upon request.
Packaging: loose in big bags.
Design with notches: 10% surcharge.
Other covers and lengths available upon request.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.

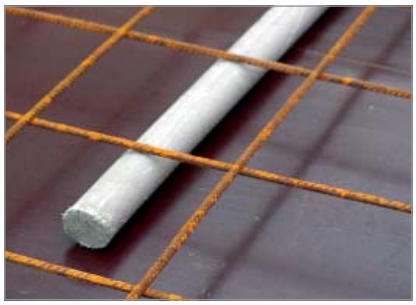
- For particularly heavy reinforcement
- Large support area spreads load
- Large support area prevents tipping

Square bar spacers – Standard length: approx. 1000 mm

made of fibre concrete for heavy, horizontal reinforcement with continuous reinforcing threads

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHV020020100	20 x 20	0.80	1500	1220
FAHV025025100	25 x 25	1.30	1000	1320
FAHV030030100	30 x 30	1.80	750	1370
FAHV035035100	35 x 35	2.50	500	1270
FAHV040040100	40 x 40	3.20	450	1460
FAHV050050100	50 x 50	5.00	250	1270
FAHV060060100*	60 x 60	7.20	150	1100
FAHV070070100*	70 x 70	9.40	100	960
FAHV080080100*	80 x 80	12.80	100	1300
FAHV090090100*	90 x 90	16.30	80	1324
FAHV100100100*	100 x 100	20.00	60	1220

Other dimensions available upon request. Rectangular profiles available upon request.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A when installation direction is longitudinal to main tension direction.
* Non-stock items, delivery time upon request.



- Suitable for many exposed concrete applications
- For use in both precast and construction site applications
- Almost invisible due to point contact area

Round bar spacers – Standard length: approx. 1000 mm

made of fibre concrete for horizontal reinforcement and exposed concrete with continuous reinforcing threads

Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
FAHR020100	20	0.65	1500	995
FAHR025100	25	1.00	1000	1020
FAHR030100	30	1.40	750	1070
FAHR035100	35	2.00	500	1020
FAHR040100	40	2.40	400	980
FAHR050100	50	3.90	300	1190

Other covers and lengths available upon request.
Tested according to DBV fact sheet “Spacers” (01/11) DBV-c-L/F/T/A for installation direction longitudinally to the main tension direction of the reinforcement.

Special made to order cut lengths

Surcharge on invoice price packaging included

Length	Cut	Squeezing
As of 20 cm	20%	15%
15 – 19.9 cm	30%	25%
10 – 14.9 cm	40%	35%

More information about the FRANK spacers can be found in our brochure at www.maxfrank.com

Combined spacer with plastic rail

Fibre concrete spacers with profiled plastic strip,
suitable for applications where the reinforcement is not walked on such as precasting plants.

Art. no.	Production length cm	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
KOMBI20100*	approx. 100 with 5 spacers	20	0.22	1500	350
KOMBI25100		25	0.22	1000	240
KOMBI30100		30	0.24	1000	260
KOMBI35100		35	0.28	1000	300
KOMBI40100		40	0.32	1000	340
KOMBI45100		45	0.35	1000	370
KOMBI50100		50	0.40	1000	420

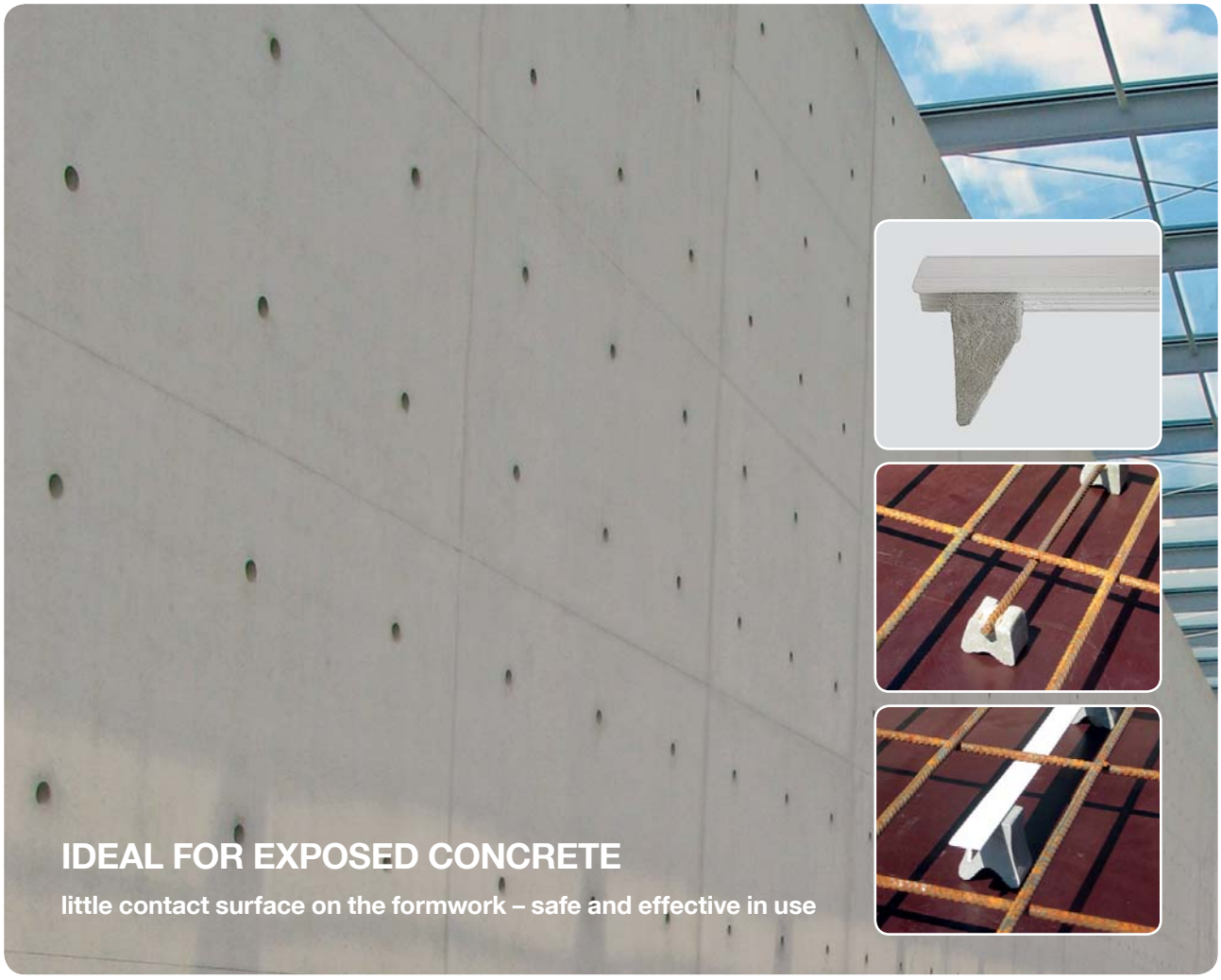
Non-stock items. Delivery time upon request.
Bevel cut spacers possible as of concrete cover of 30 mm, subject to a surcharge of 20 %. Delivery time approx. 5 working days.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.
* If the concrete cover is 20 mm, the spacers have a semicircular form.

Combined spacer with structural steel rail

Fibre concrete spacers with mild steel bar, suitable for applications where the reinforcement is not walked on such as precasting plants.

Art. no.	Production length cm	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
KOMBST20110	approx. 110 with 6 spacers	20	0.39	2000	800
KOMBST25110		25	0.40	1000	420
KOMBST30110		30	0.45	1000	470
KOMBST35110		35	0.51	1000	533
KOMBST40110		40	0.53	1000	550
KOMBST45110		45	0.56	1000	580
KOMBST50110		50	0.64	1000	660

Non-stock item. Delivery time on request.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.
Steel bar within concrete cover.



Special spacers available to order with short lead times.
From support profiles for internal formwork in bridge building to filigreed spacers, we can offer cost effective solutions to tight tolerances.

- Special dimensions and shapes can be produced quickly and efficiently to your design.
- Our extruded fibre concrete technology allows small production runs with low tool costs.
- Special mixes containing high sulfate resisting or specially coloured cements, such as Dyckerhoff white cement or red Terrament cement can be supplied.

Pile cage and diaphragm wall fibre concrete spacers

Used for bored pile foundation and in the construction of diaphragm walls to allow large reinforcement cages to be lowered into the correct position. The large contact surfaces ensure that concrete cover is maintained over the various geological layers.

Pile cage spacers – article no. AROLLE

If pile cage spacers are fixed to the horizontal reinforcement, the cages can be accurately lowered into the borehole. If Tubbox® column formers are used, pile cage spacers make the insertion of the reinforcement cage much easier.

Diaphragm wall spacers – article no. ASLIWA

The skid-shaped form allows the lowering of larger reinforcement elements without the risk of jamming.

Required information when ordering pile cage spacers:

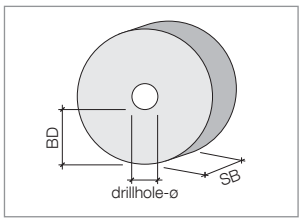
Pos.	Concrete cover BD mm	Drillhole Ø mm	Cut width SB mm	Quantity

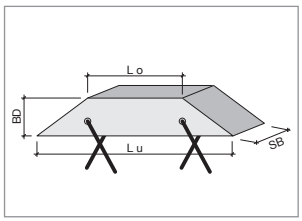
Price and delivery time on request.

Required information when ordering diaphragm wall spacers:

Pos.	Concrete cover BD mm	Lower length Lu mm	Upper length Lo mm	Cut width SB mm	Quantity

Price and delivery time on request.





Distance tubes are used to guarantee concrete wall thickness using reusable tie bars.

The perfect technical solution for shutter ties

- High compressive strength
- Large contact area, therefore reduced pressure on the formwork
- Conforms to DIN EN 1992-1-1:2011-01 (Eurocode 2) and DIN 18216 (formwork anchors for concrete formwork)
- Can be manufactured as impermeable shutter ties – tested according to DIN EN 12390-8 (3 days at 5 bar water pressure)
- Fire resistant to fire resistance classes F30 – F180, suitable for fire walls F90 according to DIN 4102
- Sound-proof due to glued stoppers

Distance tubes – uncut

extruded fibre concrete

Art. no.	Internal diameter mm	Wall thickness mm	Length m/pce.	Lin. m/pallet	Weight kg/m	Weight kg/pallet
MR221250	22	9	1.25	750	1.83	1393
MR271250	27	9	1.25	625	2.10	1333
MR321250	32	9	1.25	500	2.20	1120

For distance tubes Ø 22-32 larger wall thicknesses are available:

for 1.5-fold
wall thickness = approx. 12 mm
- 50% surcharge
- Art. no. MRE22 - MRE32

for 2-fold
wall thickness = approx. 15 mm
- 100% surcharge
- Art. no. MRZ22 - MRZ32

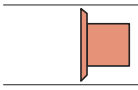
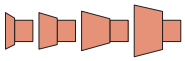
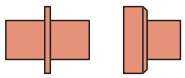
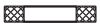
Distance tubes – fixed lengths

made of fibre concrete, internal diameter 22 mm

Art. no.	Cutting length cm	Thickness of wall to be built with two sealing caps	Thickness of wall to be built with two cones, dimension 1 cm each	Thickness of wall to be built with two cones, dimension 3 cm each	Thickness of wall to be built with two cones, dimension 5 cm each	Carton contents piece	Cartons/ pallet	Weight kg/carton	Weight kg/pallet
MR220100	10	10	12	16	20	200	24	37.60	922
MR220140	14	14	16	20	24	120	36	31.68	1160
MR220150*	15	15	17	21	25	120	36	33.96	1243
MR220180	18	18	20	24	28	100	24	33.90	834
MR220200*	20	20	22	26	30	80	36	30.32	1112
MR220220	22	22	24	28	32	100	24	41.30	1011
MR220230	23	23	25	29	33	70	36	30.52	1119
MR220240*	24	24	26	30	34	70	36	31.71	1162
MR220250*	25	25	27	31	35	70	36	32.97	1207
MR220280	28	28	30	34	38	60	36	31.68	1160
MR220300*	30	30	32	36	40	60	36	33.90	1240
MR220330	33	33	35	39	43	60	24	37.20	913
MR220350*	35	35	37	41	45	60	24	39.42	966
MR220365*	36.5	36.5	38.5	42.5	46.5	60	24	41.10	1006
MR220380	38	38	40	44	48	60	24	42.72	1045
MR220400*	40	40	42	46	50	60	24	44.88	1097
MR220450*	45	45	47	51	55	40	36	33.92	1241
MR220500*	50	50	52	56	60	40	36	37.60	1374

Any length up to 1.25 m can be produced – item number MRFIX.
All cut lengths below 10 cm are invoiced at the price of 10 cm.
Standard lengths for distance tubes Ø 27 and Ø 32 mm upon request.
* Adapted for fixing with sealing caps.

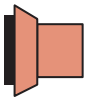
Plastic sealing cap, cone, coupling, rubber stoppers

	Art. no.	Designation	Internal diameter mm	Installed length mm	Sack contents pcs.
	MKAP22*	Sealing cap Ø 22	22	1.0	3750
	MKAP27	Sealing cap Ø 27	27	1.5	250
	MKAP32	Sealing cap Ø 32	32	1.0	250
	MKO22*	Cone Ø 22 - 1 cm deep	22	10.0	2500
	MKON22T*	Cone Ø 22 - 3 cm deep	22	30.0	1000
	MKON22T50	Cone Ø 22 - 5 cm deep	22	50.0	250
	MKON27	Cone Ø 27	27	10.0	2500
	MKON32	Cone Ø 32	32	10.0	250
	MKUP22*	Coupling Ø 22	22	3.0	2000
	MKUP27	Coupling Ø 27	27	3.0	250
	MKUP32	Coupling Ø 32	32	3.0	250
	MKUW22	Cast-steel water stop coupler	22	1.0	250
	MFD22	Flat jointing Ø 36 x Ø 20 x 2 mm; self-adhesive for cone MKO22	22	–	100
	MFD2208	Flat jointing Ø 36 x Ø 20 x 8 mm; self-adhesive for cone MKO22	22	–	100
	MFD22T	Flat jointing Ø 39 x Ø 25 x 2 mm; self-adhesive for cone MKON22T and MKON22T50	22	–	100
	MFD22T06	Flat jointing Ø 39 x Ø 25 x 6 mm; self-adhesive for cone MKON22T and MKON22T50	22	–	100
	MFD27	Flat jointing Ø 45 x Ø 24 x 2 mm; self-adhesive for cone MKON27	27	–	100

* in bags of 250 pcs.

Plastic sealing cones with glued flat jointings

as architectural means of design for exposed concrete surfaces

	Art. no.	Internal diameter mm	Installed length mm	Sack contents pcs.
	MKO22FD02	22	10	250
	MKO22FD08	22	10	250
	MKON22TFD02	22	30	250
	MKON22TFD06	22	30	250
	MKON22T50FD02	22	50	250
	MKON22T50FD06	22	50	250

Spare flat seal MFD22 and/or MFD2208.

Coverage of Repoxal and Repoxal TW

The consumption of Repoxal two-component glue for 1000 stoppers, 20 mm long, is:

- Ø 22 mm – approx. 3 kg
- Ø 27 mm – approx. 4 kg
- Ø 32 mm – approx. 5 kg
- Ø 40 mm – approx. 7 kg

Glue and accessories

Designation	Art. no.
Repoxal two-component glue (spec. for joints impermeable to water), in 1 kg tins – 10 kg/box	MREPOX
Extra hardener for Repoxal two-component glue	MREPOXH
Repoxal TW two-component glue (approved for joints in the drinking water sector), in 0.75 kg tins – 6 kg/box	MREPOXTW
Relafan glue (for frost-free internal use only), in 1 kg tins – 12 kg/box	MRELAF
Cone extractor	MZGKONEN
Cleaning brush for distance tubes dia. 22 mm	MRBUERSTE
Cleaning brush for distance tubes dia. 22 mm with drill adapter	MRBUERSTEAB
Cleaning brush for distance tubes dia. 27 mm with drill adapter	MRBUERSTEAB27
Stopper jig	MVLEHRE
Mounting tongs for fibre concrete sealing cones Ø 43 mm	MRMZK43
Mounting tongs for fibre concrete sealing cones Ø 59 mm	MRMZK59

Sealing stoppers

extruded fibre concrete

Art. no.	Diameter mm	Length cm	Sack contents pcs.	Weight kg/100 pcs.	Pieces/pallet	Weight kg/pallet
ST220020	22	2	1000	1.60	50000	820
ST270020	27	2	1000	2.40	50000	1220
ST320020	32	2	750	3.30	30000	1010
ST220050	22	5	500	4.00	25000	1020
ST270050	27	5	400	5.90	16000	964
ST320050	32	5	250	8.30	15000	1265

Sealing stoppers 125 cm long - uncut

extruded fibre concrete

Art. no.	Diameter mm	Weight kg/m	Pieces/pallet	Weight kg/pallet
ST221250	22	0.78	1250	1239
ST271250	27	1.17	1000	1483
ST321250	32	1.65	500	1052

For price and availability of bespoke stoppers please contact our hotline

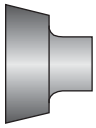
FB-Kombistop

Sealing plug made of fibre reinforced concrete with integrated seal

	Art. no.	Diameter mm	Length cm	Carton contents piece	Weight kg/carton
	ST2250FG	22	5	100	3.40

Exposed concrete sealing cones

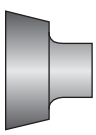
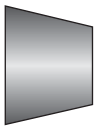
made of fibre reinforced concrete for sealing of conical anchor holes and as architectural means of design for exposed concrete surfaces

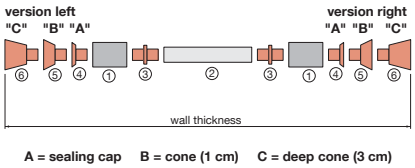
	Art. no.	Designation	Weight kg/pce.	Carton contents piece
	FBVKZ22	Fibre reinforced concrete cone with spigot, flush, suitable for cone Ø 22 - 1 cm (MKO22)	0.03	100
	FBVKZ22T	Fibre reinforced concrete cone with spigot, flush, suitable for cone Ø 22 - 3 cm (MKON22T)	0.06	100
	FBVKZ22T50*	Fibre reinforced concrete cone with spigot, flush, suitable for cone Ø 22 - 5 cm (MKON22T50)	0.12	100
	FBVKZ27*	Fibre reinforced concrete cone with spigot, flush, suitable for cone Ø 27 - 1 cm (MKON27)	0.05	100
	FBVK22T	Fibre reinforced concrete cone, flush, suitable for cone Ø 22 - 3 cm (MKON22T)	0.06	100
	FBVK22TZV05	Fibre reinforced concrete cone, set back by 5 mm, suitable for cone Ø 22 - 3 cm (MKON22T)	0.05	100
	FBVK22T50	Fibre reinforced concrete cone, flush, suitable for cone Ø 22 - 5 cm (MKON22T50)	0.11	100
	FBVKSKK	Fibre reinforced concrete cone, flush, suitable for steel-plastic cone (GEWSKO15)	0.19	100

Special designs and dimensions can be produced on request.
* Non-stock item, delivery time on request. Fibre concrete cone for lift anchor article number FBVKAHA on request.

Exposed concrete sealing cones

made of cast concrete for closing conical anchor holes and as design material for exposed concrete surfaces

	Art. no.	Designation	Weight kg/pce.	Carton contents piece
	GBVKZ22	Cast concrete cone with spigot, flush, suitable for cone Ø 22 - 1 cm (MKO22)	0.03	100
	GBVKZ22ZV05	Cast concrete cone with spigot, set back by 5 mm, suitable for cone Ø 22 - 1 cm (MKO22)	0.02	100
	GBVKZ27	Cast concrete cone with spigot, flush, suitable for cone Ø 27 - 1 cm (MKON27)	0.05	100
	GBVK22T	Cast concrete cone, flush, suitable for cone Ø 22 - 3 cm (MKON22T)	0.06	100
	GBVK22TZV05	Cast concrete cone, set back by 5 mm, suitable for cone Ø 22 - 3 cm (MKON22T)	0.05	100



A = sealing cap B = cone (1 cm) C = deep cone (3 cm)

Combined shutter tie art. no. V22VBS – V27VBS

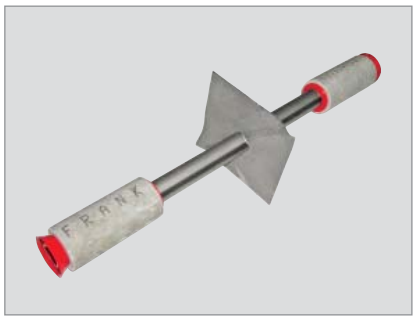
for shuttier ties as of approx. 60 cm

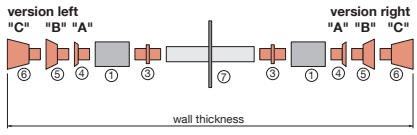
Pos.	Distance tube LW Ø mm	Wall thickness cm	Version left	Version right	Number of pcs.

Prices apply to the supply of unmounted component parts.
Any intermediate size can be produced.
For higher tensioning forces we recommend the use of a steel washer between steel tube and plastic coupling.

consisting of:

① 2 pieces distance tubes 10 cm long (1.5 times wall thickness)
② 1 piece steel tube with internal Ø 22 mm (suited to wall thickness)
③ 2 pieces couplings
④ 2 pieces sealing caps (= version A) or
⑤ 2 pieces cones (= version B) or
⑥ 2 pieces deep cones (= version C)





A = sealing cap B = cone (1 cm) C = deep cone (3 cm)

Combined shutter tie with steel plate water stop art. no. V22WSS - V27WSS

for shutter ties as of approx. 60 cm (continuous steel rebar)

Pos.	Distance tube LW Ø mm	Wall thickness cm	Version left	Version right	Number of pcs.

Prices apply to the supply of unmounted component parts.
Any intermediate size can be produced.
For higher tensioning forces we recommend the use of a steel washer between steel tube and plastic coupling.

consisting of:

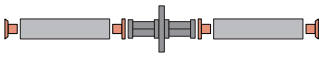
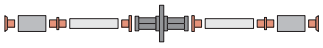
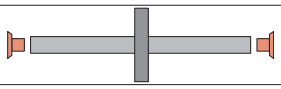
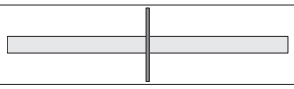
① 2 pieces distance tubes 10 cm long (1.5 times wall thickness)
③ 2 pieces couplings
④ 2 pieces sealing caps (= version A) or
⑤ 2 pieces cones (= version B) or
⑥ 2 pieces deep cones (= version C)
⑦ 1 piece steel tube with internal Ø 22 mm with steel plate water stop (suited to wall thickness)

Steel tubes for combined shutter tie

Art. no.	Type	Weight kg/m
MSR226000	Ø 22 x Ø 24 x 6000 mm	0.55
MSR223000	Ø 22 x Ø 24 x 3000 mm	0.55
MSR276000	Ø 27 x Ø 30 x 6000 mm	1.05

Any length up to 6 m can be supplied.
Cut lengths less than 500 mm = 40% surcharge;
Cut lengths from 500 mm to 1000 mm = 30% surcharge;
Cut lengths over 1000 mm = 20% surcharge

Shutter ties special versions

	Designation	Art. no.
	Combined shutter tie with cast-iron water stop and fibre concrete tubes	V22WSG
	Combined shutter tie with cast-iron water stop, fibre concrete end pieces and steel tubes	V22WSGST
	Distance tube with glued-on fibre concrete disk (continuous tie bars)	MR22FBS MR27FBS
	Distance tube in two parts with coupler (continuous tie bars)	MR22KUP MR27KUP
	Steel plate water stop 120 x 120 mm – interference-fitted to steel tube Ø 22 and sealed (continuous tie bars)	MWSS22
	Steel plate water stop 120 x 120 mm – welded to steel tie bar Ø 15 – type B (without steel/plastic cone)	GEWWSB15

Products are supplied as unassembled components. Delivery time on request.

Special mortar

Special mortar – non-shrinking cement based mortar for filling FRANK combined shutter ties and for filling of concrete openings of any types.

	Designation	Art. no.	Weight kg/bag	Sack/pallet
	3/25 special mortar	MQUELLM	25,00	40

Pot life:

The pot life is approx. 40 min depending on the temperature. Do not work the mortar at ambient, component and mortar temperatures below + 5° C.

Consumption:

You will need approx. 1 kg dry mortar per lin. m. of Ø 22 mm distance tube.

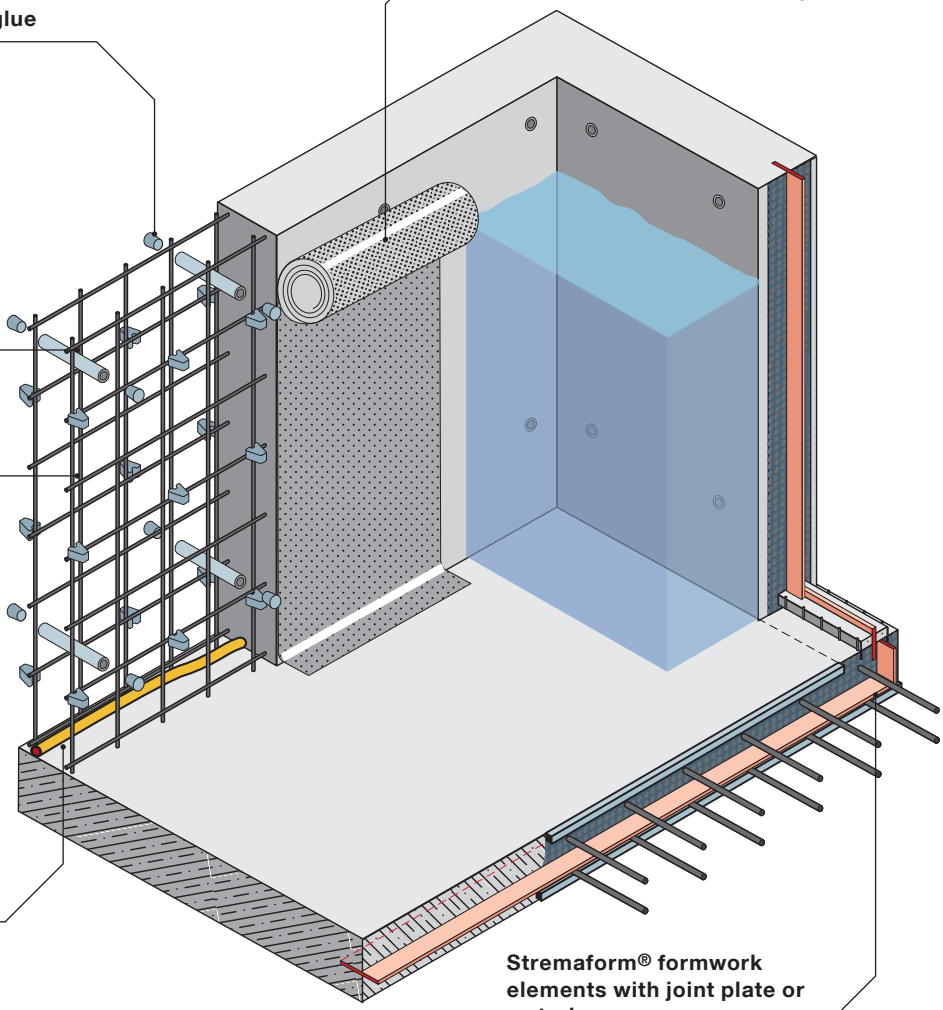
Hand pump and spare parts

	Art. no.	Designation
	MQUELLVS	Hand pump
	MQUELLDK	Spare part: nozzle cap (1)
	MQUELLMK	Spare part: piston plunger (2)
	MQUELLVSD	Spare part: nozzle (4)

Accessories for hand pump

	Designation	Art. no.
	Extension nozzle: 500 mm for filling greater wall depths	MQUELLVSV
	sealing stopper for internal Ø 22 mm, with air bleed hole	KVST22L
	Filling device for hand pump (without hand pump and bucket)	MQUELLBV

Meeting the high demands cited above FRANK products have been approved for drinking water applications and can be used without any restrictions.



In Germany drinking water reservoir structures are virtually exclusively made of concrete. The rules established by the DVGW e.V. (German Association for gas and water applications) contain the measures to be taken into account during the planning and construction phases of concrete drinking water reservoirs.

The DVGW instruction sheet W300 “Planning, construction and maintenance of water reservoirs” recommends a concrete impermeable to water and of low porosity, which does not require any additional measures in terms of surface treatment or lining. In order to avoid any drinking water pollution, the materials used in such applications have to be tested according to:

- **UBA-guideline epoxy resin coating:** for hygienic assessment of epoxy resin coating in contact with drinking water
- **DVGW instruction sheet W347:** “Hygienic requirements on cement-based materials in drinking water applications” – for cement-based materials such as fibre concrete – corresponds with the KTW test (migration test).
- **DVGW instruction sheet W270:** “Test on microbiological growth for materials used in drinking water applications”. Materials in contact with drinking water must not deteriorate the microbiological condition of the water, i.e. release particles which would lead to growth of micro organisms. In order to determine those materials suitable for drinking water applications, this test is indispensable.
- Due to a lack of basic information, testing of inside joint seals, such as Intec and Fradiflex to DVGW W270 could not be carried out so far.

Single spacers made of fibre concrete TW

tested according to DVGW-W270 and DVGW-W347

	Art. no.	Concrete cover mm	Cut width mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	AD3572TW	35/40/50	24	10.40	250	1060
	AD4572TW	45/55/60	24	15.30	125	785

Non-stock items – delivery time upon request.
Packaging: 40 bags per pallet.

Bar spacers made of fibre concrete TW – type “Snake”

Standard length: approx. 1000 mm

	Art. no.	Concrete cover mm	Weight kg/pce.	Pieces/pallet	Weight kg/pallet
	FAHKS40100TW	40	1.25	600	770
	FAHKS45100TW	45	1.45	500	745
	FAHKS50100TW	50	1.76	500	900

Non-stock items, delivery time upon request.
Tested according to DBV fact sheet “Spacer” (01/11) DBV-c-L/F/T/A for installation direction longitudinal to the main tension direction of the reinforcement.

Bar spacers made of fibre concrete TW – type triangular with hook

Standard length: approx. 180 mm

	Art. no.	Concrete cover mm	Carton contents piece	Weight kg/carton	Cartons/pallet	Weight kg/pallet
	FAHDH40018TW	40	75	19.43	24	486
	FAHDH45018TW	45	60	21.78	24	543
	FAHDH50018TW	50	50	21.80	24	543

Non-stock items, delivery time upon request.
Tested according to DBV fact sheet “Spacer” (01/11) DBV-c-L/F/T/A.

Distance tubes made of fibre concrete TW

Art. no.	Internal diameter mm	Wall thickness mm	Length m/pce.	Weight kg/m	Lin. m/pallet	Weight kg/pallet
MR221250TW	22	9	1.25	1.83	750	1393

Non-stock item, delivery time on request. Standard lengths for distance tubes are available on request.

Stoppers made of fibre concrete TW

Art. no.	Diameter mm	Length mm	Sack contents pcs.	Weight kg/100 pcs.	Pieces/pallet	Weight kg/pallet
ST220020TW	22	20	1000	1.60	50000	820

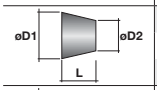
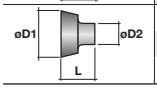
Non-stock item, delivery time on request.

Art. no.	Diameter mm	Length mm	Weight kg/m	Pieces/pallet	Weight kg/pallet
ST221250TW	22	1250	0.78	1250	1239

Non-stock item, delivery time on request.

Sealing cones made of fibre concrete TW

for the sealing of conical shutter tie holes

	Art. no.	Ø D1 mm	Ø D2 mm	Length mm	Weight kg/pce.	Carton contents piece	Suitable for KU cone
	FBVK22TTW	42.60	32.00	28	0.06	100	MKON22T
	FBVKSKKTW	59.00	50.00	40	0.19	100	GEWSKO15
	FBVKZ22TW	41.00	21.60	22	0.03	100	MKO22
	FBVKZ22TTW	42.60	21.60	40	0.06	100	MKON22T

Special designs and dimensions can be produced to order. Non-stock item, delivery time on request.

Repoxal TW two-component glue

Designation	Art. no.
Repoxal TW two-component glue (approved for joints in the drinking water sector), in 0.75 kg tins – 6 kg/box	MREPOXTW

For coverage please refer to page 20.

FRANK spacers made of cast concrete are used to ensure the specified cover for concrete structures and structural elements is maintained, both before and during concreting.

- No deformation in heat and cold, concrete cover is maintained.
- Extremely suitable for impermeable concrete, no hairline cracks between the spacer and the concrete.
- Fire resistant to the highest requirements specified in DIN 4102 – Class 1A (non combustible).
- FRANK spacers made of cast concrete satisfy regular requirements and specific requirements of the DBV data sheet “spacers”.

Spacers with shuttlecock clips

cast concrete

	Designation	Art. no.	Concrete cover mm	Weight kg/100 pcs.	Sack contents pcs.	Weight kg/pallet
	for vertical reinforcement rebar dia. 4 – 10 mm	AB20HRF	20	2.40	500	500
		AB25HRF	25	3.20	250	340
		AB30HRF	30	3.90	250	410
		AB35HRF	35	4.80	250	500
		AB40HRF	40	5.50	250	570
		AB45HRF	45	7.30	250	750
		AB50HRF	50	8.50	200	700
	for vertical and horizontal reinforcement rebar dia. 4 – 10 mm	AB25HVF	25	4.60	250	480
		AB30HVF	30	5.90	250	610
		AB35HVF	35	7.10	250	730
		AB40HVF	40	8.30	250	850
		AB45HVF	45	11.00	250	1120
		AB50HVF	50	12.80	200	1044

Packaging: 40 sacks per pallet.
Further types made of cast concrete available on request.
Tested according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.

Spacer with loop wire

cast concrete

	Art. no.	Concrete cover mm	Weight kg/100 pcs.	Sack contents pcs.	Sack/pallet	Weight kg/pallet
	AB20HFOED	20	5.70	400	50	1160
	AB25HFOED	25	7.30	300	50	1115
	AB30HFOED	30	8.80	250	50	1120
	AB35HFOED	35	10.50	250	40	1070
	AB40HFOED	40	11.10	250	40	1130
	AB45HFOED	45	12.70	200	40	1036
	AB50HFOED	50	14.50	150	40	1180

Additional concrete covers up to 100 mm available upon request.
Approved according to DBV data sheet “Spacers” (01/11) DBV-c-L/F/T/A.

Plastic ring spacer

Art. no.	Concrete cover mm	For iron-Ø mm	Sack contents pcs.	Pieces/pallet	Weight kg/100 pcs.
KRA15	15	10	1000	40000	0.28
KRA20	20	10	1000	30000	0.40
KRA25	25	10	500	30000	0.61
KRA30	30	10	500	20000	0.94
KRA35	35	10	200	12000	1.60
KRA40	40	10	125	10000	1.73
KRA50	50	10	100	5000	2.40

Plastic kickers

to use as stop spacers between shutters, for fixing by nail or nailgun

Designation	Art. no.	External Ø mm	Height h mm	Weight kg/pce.	Pack size piece
Kickers without nail	SAKURU	49	35	0.02	600
Kickers with nail	SAKRVN	49	35	0.02	100
Nail suitable for nail gun, shaft diameter 3.7 mm, shaft length 62 mm	SAKURN	–	–	0.01	100

The nails are suitable for most of the standard nail guns.
If necessary, please check suitability of nails with the nail gun manufacturer.

Bar spacers made of plastic

Designation	Art. no.	Concrete cover mm	Length m	Pcs./bundle	Lin. m/pallet	Weight kg/100 m
U-Pro – supporting profile, with lateral notches	KUM15	15	2.00	50	5400	11.00
	KUM20	20	2.00	50	6300	14.00
	KUM25	25	2.00	50	4900	17.50
	KUM30	30	2.00	50	4200	21.50
	KUM35	35	2.00	30	3240	24.00
	KUM40	40	2.00	30	2400	25.50
	KUM50	50	2.00	30	1440	42.00
U-Pro – supporting profile – without lateral notches for insulation	KUO15	15	2.00	50	5400	14.00
	KUO20	20	2.00	50	6300	17.00
	KUO25	25	2.00	50	4900	20.50
	KUO30	30	2.00	50	4200	24.00
	KUO35	35	2.00	30	3240	26.50
	KUO40	40	2.00	30	2400	28.50
	KUO50	50	2.00	30	1440	50.50

Millihax - plastic disk spacer

Designation	Art. no.	Concrete cover mm	Sack contents pcs.	Sack/pallet	Weight kg/bag	Weight kg/pallet
Max. disk Ø approx. 400 mm; min. disk Ø approx. 150 mm; packaging: 12 pcs/set	KMIH15	15	300	24	9.30	243
	KMIH20	20	300	16	9.90	178
	KMIH25	25	300	16	10.80	193
	KMIH30	30	300	16	11.40	202

Plastic pipes - for use as distance tubes

circular tube, with roughened surface

	Art. no.	Internal diameter mm	External diameter mm	Length m	Pcs./bundle	Lin. m/pallet	Weight kg/m
	KR2226	22	26	2.00	50	3000	0.23
	KR2228	22	28	2.00	50	3000	0.28

suitable for the use of KKO22 - cone grey

Accessories for plastic pipes

plastic

	Designation	Art. no.	Diameter mm	Construction length cm	Sack contents pcs.	Weight kg/100 pcs.
	Face cap for circular tube Ø 22 mm	KVK2240	22/40	2.50	500	0.76
	Sealing plug for circular tube & facing cap	KVST22	22	1.20	500	0.19
	Plug for internal sealing of circular tube	KIST22	22	2.50	500	1.00
	Grey cone for circular tube Ø 22 mm	KKO22	22	1.00	500	0.35

Plastic distance tubes

	Designation	Art. no.	Length cm	Pack size pieces/carton
	Double ended plastic distance tubes incl. 2 stoppers, internal diameter 22 mm, stronger version with wider contact area on formwork	KMS200	20	100
		KMS240	24	100
		KMS250	25	100
		KMS300	30	100
		KMS365	36.5	100
		KMS400	40	100
	Sealing plug for quick and reliable sealing of the brickwork thicknesses	KMSV22	–	200

Continuous high chairs are used as spacers between the lower and upper reinforcement layers in bases, slabs and walls. They fix the distance between both reinforcement layers and hold them in the correct structural position.

Peace of mind for concrete cover, structural calculations and formwork longevity

- Tested according to DBV fact sheet “Supports” according to Eurocode 2
- Saves time and material through fast laying and a support width of 20 cm
- Won‘t tip over due to a stable contact surface with the lower reinforcement
- No contact with the formwork, therefore no damage to the formwork skin and no rust stain formation on the concrete surface
- Strong – able to support foot traffic.
- Especially suitable for mesh and individual bar reinforcement
- The weight of the steel in the high chairs can calculated as part of the reinforcement based on VOB (German contract procedure for building works), part C DIN 18331, section 5.3.1.1.

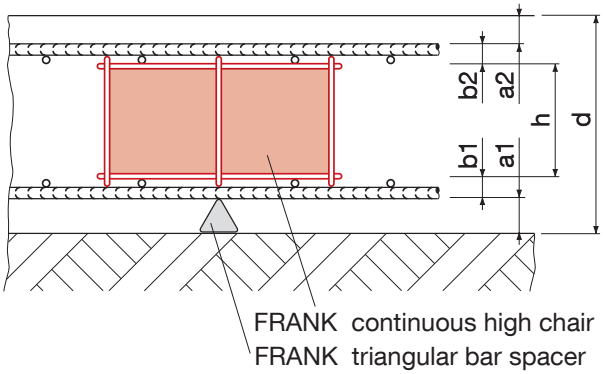
Required information when ordering continuous high chairs:

The following number of continuous high chairs are required for normal construction loadings:

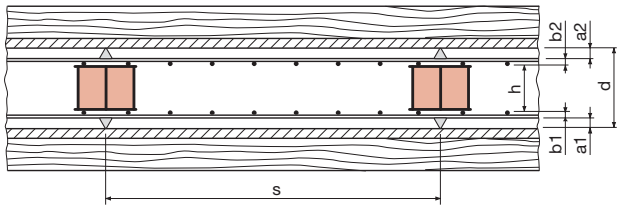
Diameters of supported bars	Laying interval	Approx usage/m²
Ø ≤ 6.5 mm	500 mm	1.0
Ø > 6.5 mm	700 mm	0.7

The table should only be used as a guideline for determining the number required. The assumed bearing capacity corresponds to that of loads of conventional types of reinforcement. Please note that in particular, transmission of heavy point loads is not possible.
The exact spacing must always match the requirements of the reinforcement and concrete cover and must be checked on site. The deciding factor is the acceptable level of deflection when the reinforcement is walked on (when concreting).
If the reinforcement is not subject to foot traffic, such as in precasting plants or when using continuous high chairs for wall constructions, the quantities above can be reduced by approx. 10 – 20 %.

System construction „slab“ + „base“
Support width 20 cm



System construction „wall“



U-Korb

Continuous high chairs are used as spacers between the upper and lower reinforcement layers in bases, slabs and walls.

Art. no.	Height h mm	Designation	Pieces/pallet	Weight kg/pallet
UKS02	20	2/200	2000	824
UKS03	30	3/200	2000	854
UKS04	40	4/200	2000	884
UKS05	50	5/200	1500	691
UKS06	60	6/200	1500	713
UKS07	70	7/200	1000	497
UKS08	80	8/200	1000	512
UKS09	90	9/200	1000	527
UKS10	100	10/200	900	490
UKS11	110	11/200	800	450
UKS12	120	12/200	700	406
UKS13	130	13/200	600	397
UKS14	140	14/200	600	406
UKS15	150	15/200	600	415
UKS16	160	16/200	500	357
UKS18	180	18/200	500	429
UKS20	200	20/200	400	362
UKS22	220	22/200	400	411
UKS24	240	24/200	300	324
UKS26	260	26/200	300	349
UKS28	280	28/200	300	360
UKS30	300	30/200	300	371
UKS32	320	32/200	300	434
UKS34	340	34/200	200	303
UKS36	360	36/200	200	311
UKS38	380	38/200	200	318

Packaging: Bundles of 25 pcs. on non-returnable pallet; DBV-h-B-L, certified according to DBV data sheet “Continuous high chairs”

Determination of required chair height:

Determination of the required chair height taking the required concrete cover and design slab thickness into account:

Example:

1. Lower reinforcement concrete cover	a1	30 mm
2. Upper reinforcement concrete cover	a2	20 mm
3. Lower reinforcement thickness*	b1	15 mm
4. Upper reinforcement thickness*	b2	15 mm
Total	x	80 mm

Required slab thickness “d” minus total „x“ gives the necessary chair height “h”.
In our example with a required slab thickness of 200 mm: 200 - 80 = 120 mm U-Korb continuous chair height corresponds with UKS12

* Please take mesh overlap into account

Designation according to DBV data sheet “Continuous high chairs”

DBV-h-B-L

DBV	*continuous high chairs are approved and meet the requirements of the DBV data sheet*
h	*supporting height (in mm)*
B	*standing on the reinforcement*
L	*linear design version*

for example when ordering DBV-100-B-L

FORMWORK TECHNOLOGIES

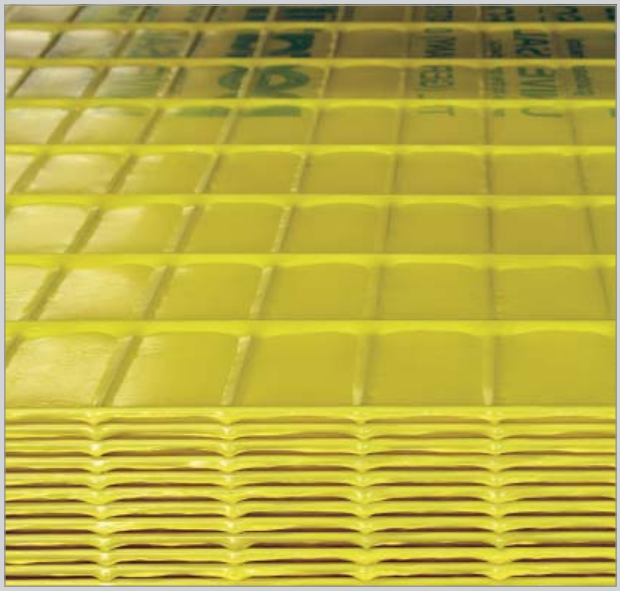
FRANK offers a varied range of specialized formwork products. The range includes liners to improve concrete aesthetics and durability, plus special foundation forms, formwork for construction joints and other forms for precast and insitu applications.

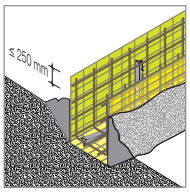
- Pecafil® universal formwork systems
- Stremaform® formwork elements
- Tubbox® column formers
- Fratec® shaping formwork
- Zemdrain® CPF formwork liner
- Formwork elements for balconies and slabs
- Box-out shutters and recess formers
- Accessories for formwork systems

Pecafil® is an easy to use formwork system for the fast and economical construction of ground beams, pile caps, other foundation formwork, box-outs and as facing formwork to sheet and bored pile walls.
Additionally, Pecafil® can be used for ribbed slabs as well as for weather and dust protection.

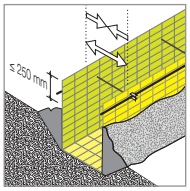
Pecafil® consists of a special steel mesh with varying bar diameters and a heat shrunk polyethylene film.
Pecafil® is mainly used as lost formwork, but can also be reused in certain applications.

- Short assembly times, because the material is cut to size to your specifications in our factory
- Bent or complicated foundation shuttering shapes can be produced simply – also at the construction site
- Environmentally friendly due to the use of polyethylene film and also suited for areas of groundwater preservation
- Absolutely no release agent required

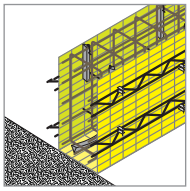




Shallow Foundation
Pecafil® can be used without any additional stiffening when there is earth support.

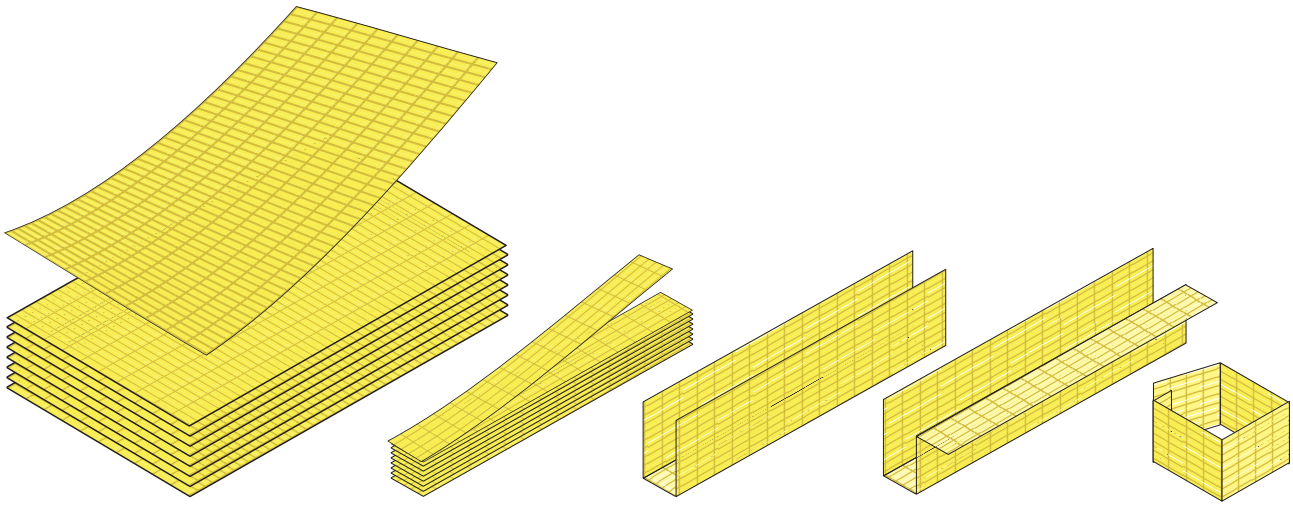


Medium Depth Foundations
For in-ground applications no additional stiffening is necessary. For partially in ground or fully above ground applications additional stiffening in the form of Pecafil® distance spacers must be used in order to prevent excess deflection due to pressure during the concrete pour.



Deep Foundations
For wholly in ground applications additional stiffening may not be required. For above ground applications additional horizontal stiffening in the form of Pecafil® distance spacers and reusable Pecafil® girders is required.

Standard versions



Flat material | *Strip formwork* | *Pre-bent U-shaped formwork* | *Pre-shaped U-formwork with transfer section to base slab* | *Vertically bent formwork*

Can be supplied as flat material or bent to your specifications. Additional bending possibilities upon request.
When bending, ensure that the supporting bar is always on the inside of the element!
Processing costs for bending and cutting on request. Off-cuts are included in supply and invoiced at regular cost.

Pecafil® universal formwork systems

Type	Element width cm		Length
	of	up to	cm
VR6	45	600	240
VR8	75	600	240
VR10	75	600	240
VR12	75	600	240
Strong	60	120	240

Pecafil® universal formwork systems

Type	Element width cm		Length
	of	up to	cm
AS	4	40	240

Pecafil® weather protection material

(2 year UV-stabilized, galvanised wires)

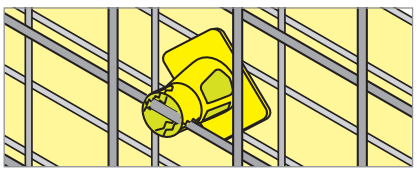
Type	Element width cm		Length
	of	up to	cm
FV 2.4	140	420	240
FV 2.4 ISO*	140	420	240

* bubble wrap

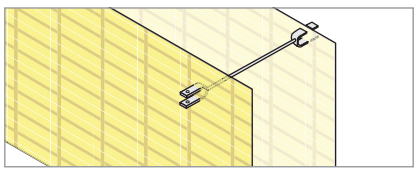
Pecafil® accessories

Designation	Art. no.
Pecafil® Spacer, plastic bar spacer, required quantity 8 pcs./m² (refer to installation instructions)	PVE0111
Pecafil® distance spacer, matching beam thickness	PV170000000
Pecafil® girder	PV81042
Pecafil® bubble wrap – extra strong, specially suited for construction, roll length 50 m, roll width 2.40 m	PV10300
Pecafil® PVC adhesive tape, yellow, extra strong, frost resisting, roll length 33 m, roll width 50 mm	PVE0036

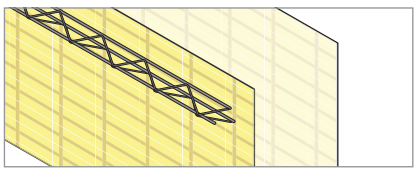
Pecafil® Spacer



Pecafil® distance spacer

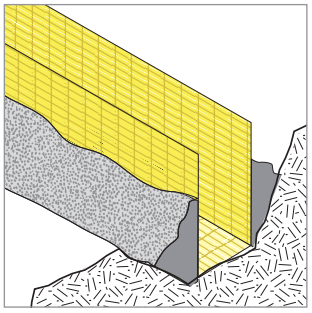


Pecafil® girder



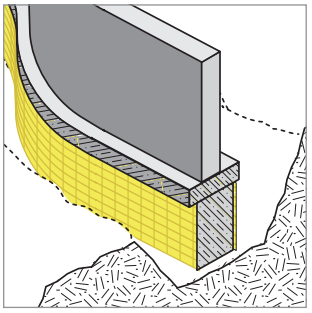
Pecafil® for strip foundation/ground beams

Pecafil® is mainly used as formwork for strip foundations and ground beams. These can be installed below or above ground level and additional support may not be necessary if supported by backfill.



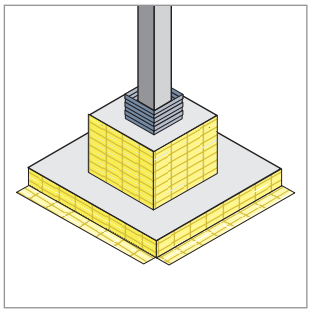
Pecafil® for circular formwork

For curved foundations Pecafil® elements are bent to the foundation shape on site.
For smaller radii the material can also be supplied prebent.



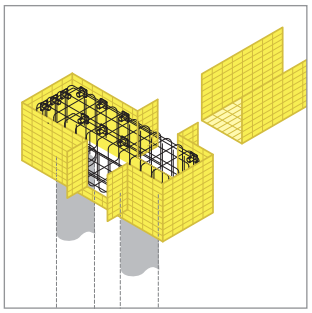
Pecafil® for box-outs

Pecafil® can be used as external formwork for foundations erected with box-out shutters.
Pecafil® is factory bent and supplied to the construction site in appropriate heights.
Circular elements can also be prebent in the factory.



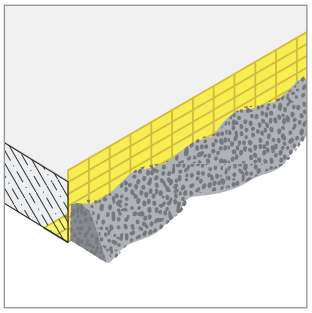
Pecafil® for pile caps

Single and multiple pile caps can be constructed using Pecafil®. These forms can accommodate various shapes and can be incorporated with ground beams. Minor bending and cutting on site enables integration with ground beams.



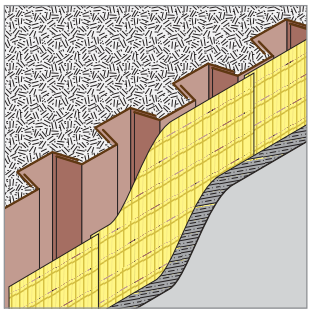
Pecafil® edge formwork

Pecafil® edge formwork is suited for use to form the edges of insitu base slabs and walls.
Pecafil® edge formwork can also be used to form semi-finished products.



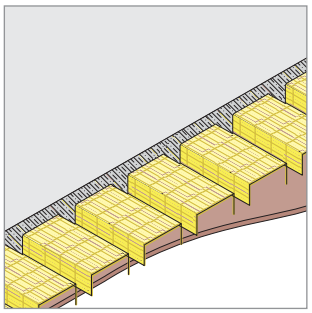
Pecafil® separation formwork

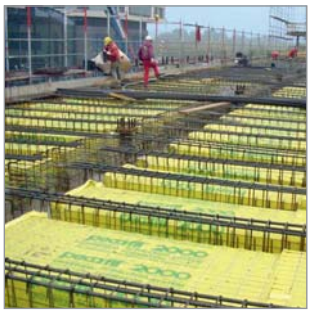
Pecafil® VR8 or VR10 is used as the separation layer between a sheet pile or bored pile wall and the concrete structure.
Pecafil® is fixed to bored piles using nails and spot welded to sheet piles.



Pecafil® ribbed slab

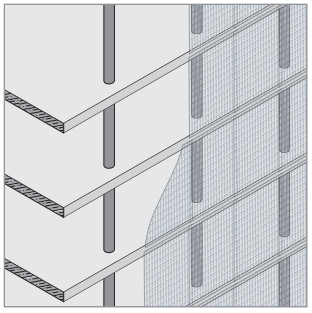
Depending on requirements, Pecafil® displacement elements for ribbed slabs are made of VR8 or VR10 universal formwork material and supplied to the construction site bent to shape. The two end caps are made of Pecafil® sealing strips or of wood.





Pecafil® weather protection

Pecafil® elements for weather protection are used as temporary weather, dust and view protection for structures.
Sheets can be made to suit any site requirement and can have integrated bubble wrap for increased insulation. The UV-stabilized plastic film guarantees a service life of at least two years.



Stremaform®

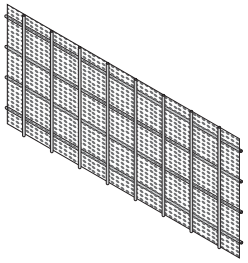
Stremaform® is a bespoke formwork element for the forming of construction joints. The product consists of a special expanded metal mesh which is welded in between longitudinal and transverse steel bars. The result is a deflection resistant element. Tests carried out by the Technical University of Brunswick show that the resistance of these construction joints to shear forces is identical to that for monolithic concrete. When using Stremaform® for bucket foundations the transferable shear forces are approximately 37 % higher than with traditional indented joints to DIN 1045-1 and according to Eurocode 2.

- Stremaform® is dimensionally stable and designed to withstand concrete pressure during the pour.
- Stremaform® formwork elements remain in the concrete and can be recycled together with steel mesh.
- Stremaform® mesh width can be adapted by our design department to your specific needs.

Product	Application:		Benefits:
	Slab widths	Wall thicknesses	
Stremaform®	≤ 500 mm	≤ 300 mm	■ Elements precisely delivered to your specifications for medium-sized components ■ Water stop can be integrated in our factory
Stremaform® strong	> 500 mm	> 300 mm	■ Suited for very thick components due to vertical bracing ■ Elements are exactly shaped to the required size ■ Water stop can be integrated in our factory
Stremaboard			■ Simple adjustment at the construction site

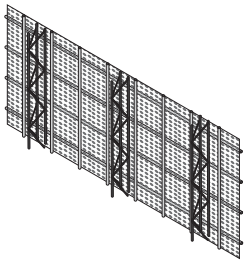
Stremaform®

Stremaform® is the formwork material for average component thicknesses.
Installation is implemented between the reinforcement layers.
With its rough surface Stremaform® already satisfies the requirements of an indented joint according to DIN 1045-1 and/or Eurocode 2.
A metal water stop or a pvc/rubber waterbar support cage can be installed in our factory if required.
The formwork is supplied precisely to your specifications.



Stremaform® strong

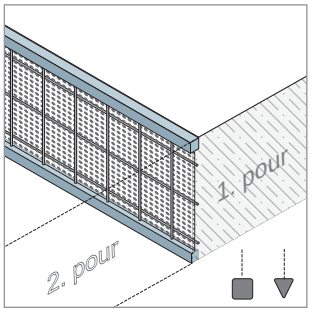
Stremaform® strong with factory made stiffening made of lattice girders is suited for any size of structural elements.
If required, a metal water stop or a pvc/rubber waterbar support cage can also be integrated.
The formwork is supplied precisely to your specifications.



Formwork elements for working joints

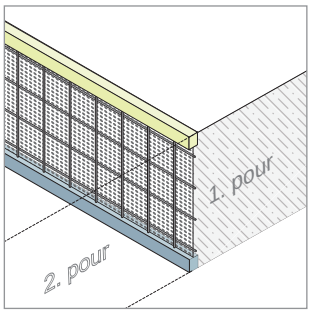
Stremaform® formwork element with concrete spacer bar, double-sided

Formwork elements with integrated extruded fibre concrete rails to ensure the correct cover, formwork suited for slabs ≤ 300 mm.



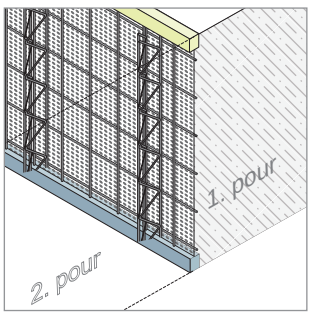
Stremaform® sheet material

Formwork elements for slab widths ≤ 500 mm and wall thicknesses ≤ 300 mm.
The material is installed between the reinforcement layers.



Stremaform® strong flat material

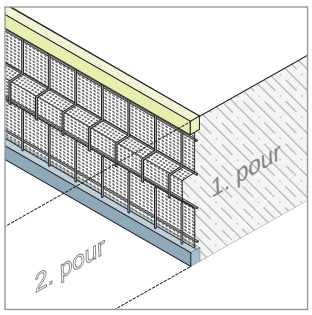
Formwork elements for any slab and wall thickness.
The material is installed between the reinforcement layers.

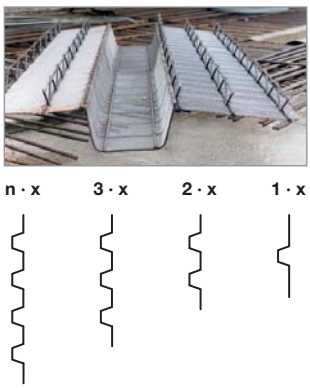


Formwork elements for indented working joints

Stremaform® with indented joint

All Stremaform® elements can be supplied with single or multiple indented joints.
The standard indented joint satisfies the requirements of DIN 1045-1 and/or Eurocode 2.

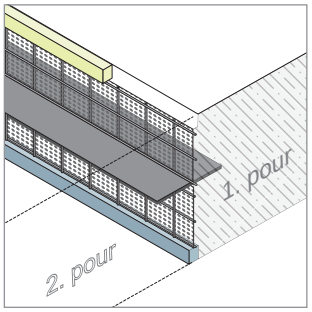




Formwork elements for working joints with metal water stop

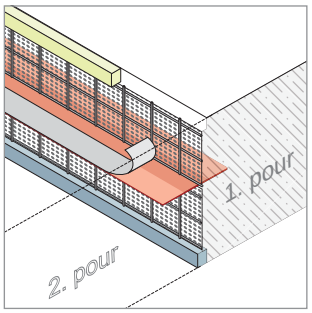
Stremaform® formwork element with metal water stop

All Stremaform® formwork elements can be supplied with a metal water stop. The metal water stop is supplied in standard widths of 250 mm and 300 mm or according to your specifications. For horizontal components, the metal water stop can be angled upwards by 15° on both sides to aid concrete placement.



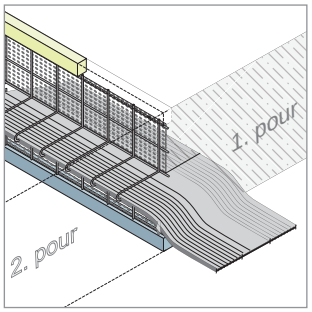
Stremaflex® formwork element with coated metal water stop

Stremaflex® formwork elements are supplied with an integrated coated metal water stop.
The metal water stop is 1.5 mm thick and 150 mm wide and is normally coated on one side, 2 x 50 mm pieces. Double sided coating available upon request.



Stremaform® formwork element with pvc/rubber water bar cage

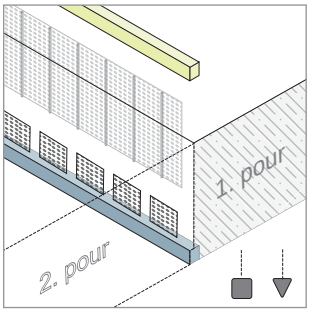
All Stremaform® elements can be supplied with a pvc/rubber water bar cage.
The cage is suited to accommodate 200, 250 or 300 mm wide water bars or made to order. For horizontal components, the cage can be angled upwards by 15° on both sides to aid concrete placement.

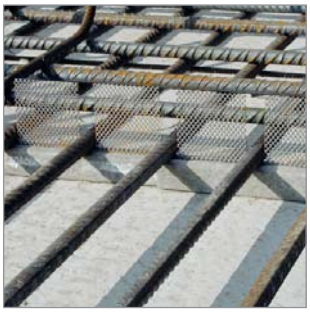


Stremaform® accessories

Stremaform® spacer

Stremaform® spacers fulfil the function of a spacer and a sealing strip at the same time. Different pitches and distances for different reinforcement diameters are already considered during production in our factory. Stremaform® spacers prevent the concrete from escaping between the reinforcement, thus avoiding time-consuming cleaning.

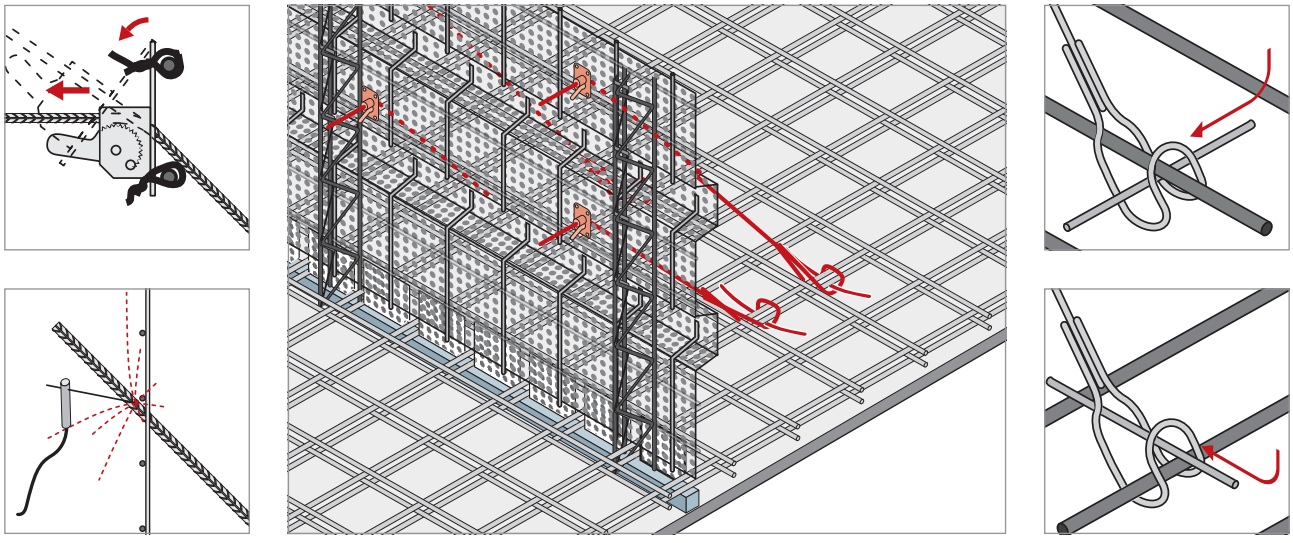




Stremafix® support anchor

Stremafix® support anchors are used to maintain the positioning of Stremaform® formwork elements in the construction joints of reinforced concrete. They provide tensile and pressure resistant anchoring of the formwork during the installation and concreting phases.
Stremafix® support anchors are used when welding of the reinforcement is not feasible or is prohibited. The use of these anchors is more straightforward than site welding thus speeding up the installation process. The eccentric clamps used with the Stremafix® support anchors can be re-used depending on the installation situation.

The Stremafix® support anchor consists of a specifically shaped hook loop hinged into the lower reinforcement layer. In order to guarantee the stability of the Stremaform® formwork elements during installation and the tensile-strength anchoring against the concreting pressure, the hook loop is fixed with a retaining rod at the bottom.
The tension member welded to the hook loop is pushed through the expanded metal of the Stremaform® formwork elements and secured during the second concreting phase by means of an eccentric clamp or optionally by welding it to a horizontal longitudinal rod to be provided by the customer (see table below).
On the basis of the different variants of the Stremafix® support anchor, different application options on the construction site can be implemented.

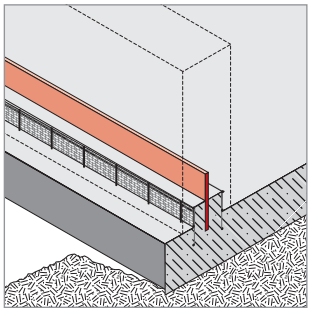


	Attachment to the reinforcement	Attachment to the Stremaform®	Resilience/individual suspension
Type 7/07	Secured by means of hooks, without welding work	Secured with eccentric clamp, without welding work	16.7 kN
Type 7/10			19.1 kN
Type 7/12		Welding	14.8 kN

Formwork elements for special shapes

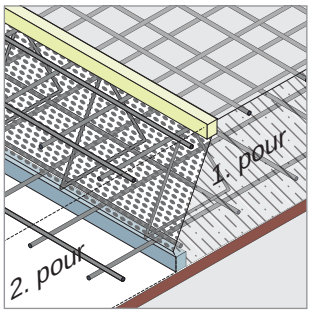
Stremaform® kickers

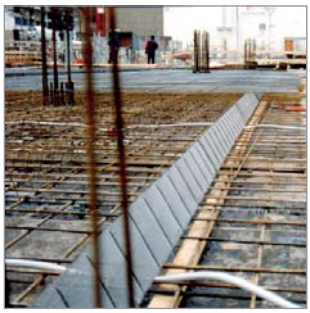
Kickers for use between base slab/wall and wall/roof slab can optionally be supplied with an integrated metal water stop (also coated) or alternatively with a pvc/ rubber water bar support cage.
Special designs (e.g. round, T-piece) are also available.



Stremaform® A bock self-supporting

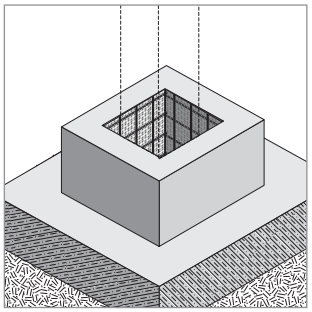
Upright Stremaform® formwork elements for slabs are available in different heights.

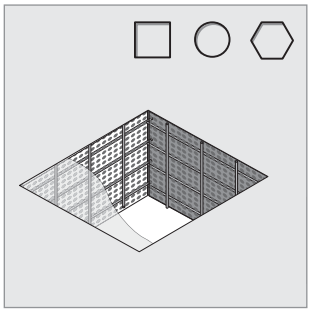




Stremaform® box-outs

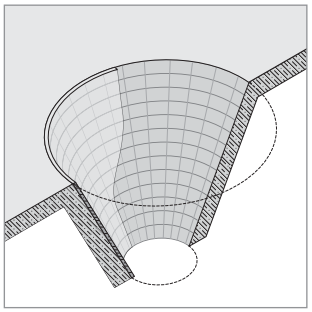
Stremaform® recess elements are available in various designs and sizes.
Optionally, recess elements are available with bracing and/or concrete cover rails.





Stremaform® hopper formwork elements

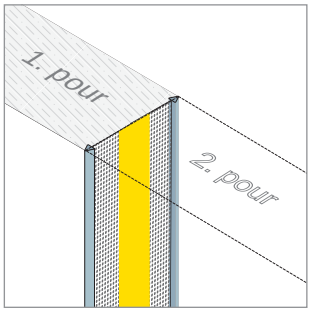
Secure fixing at the bottom via anchors and/or lift protectors prevents the risk of reinforcement uplift.
The surface is subsequently covered with screed to the required concrete cover.
The correct lower and upper dimensions and the vertical hopper height are necessary for orders.
These elements can also be supplied complete with bracing.



Formwork elements for controlled crack joints

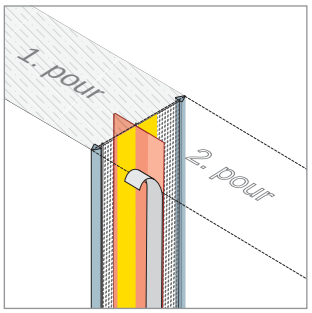
Stremaform® formwork element for controlled crack joints

Stremaform® formwork elements specially designed to prevent a positive connection between concrete sections over at least 1/3 of the structural element thickness, in order to produce a controlled crack.



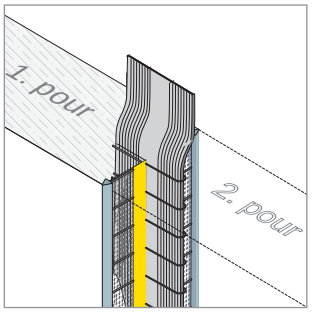
Stremaflex® formwork element with coated metal water stop for controlled crack joints

Stremaflex® formwork elements are supplied with an integrated coated metal water stop.
The metal water stop is 1.5 mm thick and 150 mm wide and is normally coated on one side, 2 x 50 mm pieces.
Double sided coating available upon request.



Stremaform® formwork element with pvc/rubber water bar cage for controlled crack joints

All Stremaform® elements can be supplied with a pvc/rubber water bar cage.
The cage is suited to accommodate 200, 250 or 300 mm wide water bars or made to order.
For horizontal components, the cage can be angled upwards by 15° on both sides to aid concrete placement.

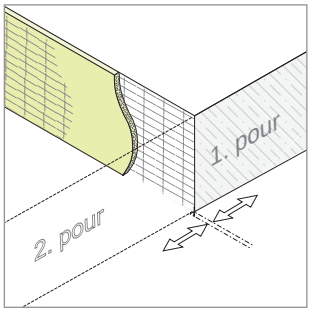


For additional information on our coated metal waterstops Fradiflex, refer to page 94.

Formwork elements for expansion joints

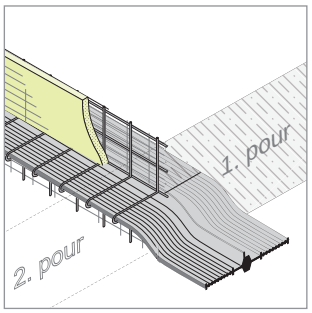
Stremaform® formwork element for expansion joints

Stremaform® formwork elements for expansion joints consist of supporting mats and an intermediate 20 mm thick expansion joint insert. This can optionally consist of polystyrene or heat-resistant mineral wool.



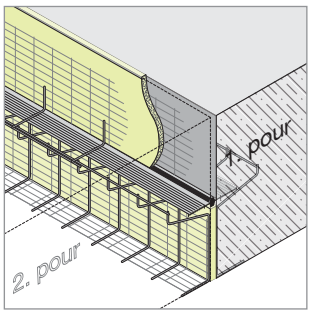
Stremaform® formwork element with pvc/rubber water bar cage for expansion joints

Stremaform® formwork elements can be supplied with an integrated cage to support the waterbar.
The Stremaform® fixing devices ensure that the central tube of the waterbar is maintained centrally in the joint before and after during the concrete pour.
For horizontal components, the cage can be angled upwards by 15° on both sides to aid concrete placement.



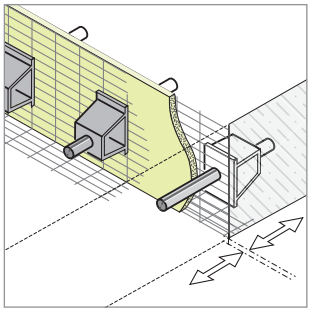
Stremaform® formwork element with 2-piece pvc/rubber water bar cage for expansion joints

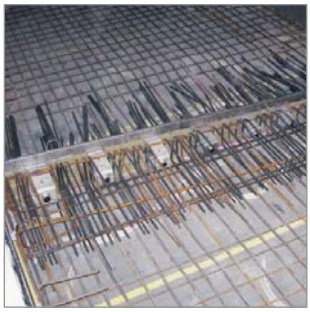
When installing large water stops we recommend the use of a 2-piece version of the supporting cage.
The pvc/rubber waterbar is rolled out onto the bottom section of the cage with the upper part of the cage being installed later.
For horizontal components, the cage can be angled upwards by 15° on both sides to aid concrete placement.



Stremaform® formwork element for expansion joints with integrated transverse force dowels.

All Stremaform® formwork elements for expansion joints can also be supplied with integrated transverse force dowels.





Stremaform® sound joint

Stremaform® sound joints create an acoustic separation between concrete components. The pre-assembled acoustic isolation element is installed between the individual units in semi-detached and terraced houses.
As these elements remain in place, subsequent stripping work is avoided and reinforcement erection can be continued without regard for the concreting work.

Stremaform® sound joints can be supplied as either simple formwork elements for concrete components or with an integrated waterbar cage for areas of potential water ingress (WU areas). Supply of the waterbar is the responsibility of the customer.
A sound-absorbing mineral fibre material of varying thickness to suit all joint widths is used in the Stremaform® sound joint.

Stremaform® sound joint with waterbar cage

In-situ concrete walls

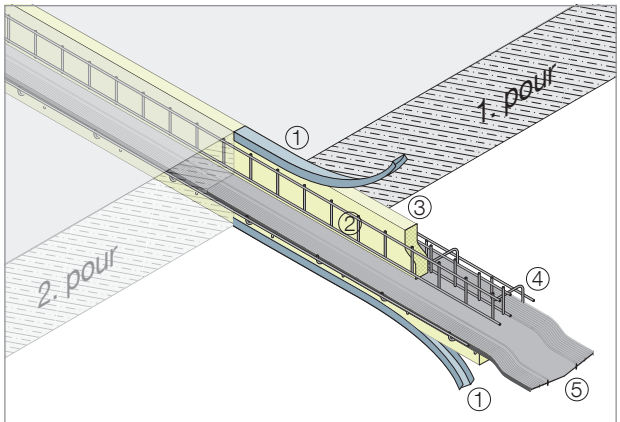
In constructing in-situ concrete walls the use of a Stremaform® sound joint with waterbar cage allows for concreting in one or more pours. The element design ensures that the correct position of the waterbar, to be provided by the customer, is always maintained.

Prefabricated element walls

For element walls, the design and installation of the Stremaform® sound joints with waterbar cage must be considered. Concreting can be executed in one continuous pour.

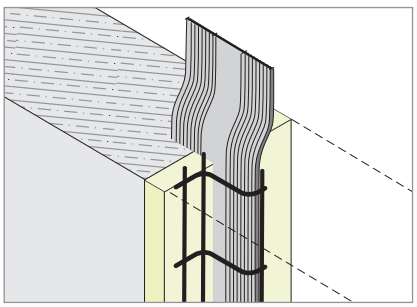
Floor and ceilings

For floor and/or ceiling joints, the waterbar cage is bent up by 15° to aid better concrete placement and to ensure a good bond between waterbar and concrete. Special transition and other elements are fabricated and delivered ex factory resulting in a fully integrated system for the entire building.

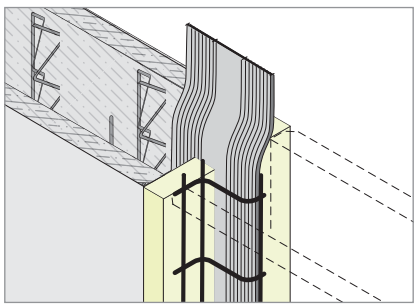


① *Transport protection*
② *Support mat*
③ *Joint insert made of mineral fibre*
④ *Waterbar cage*
⑤ *Waterbar (to be provided by the customer)*

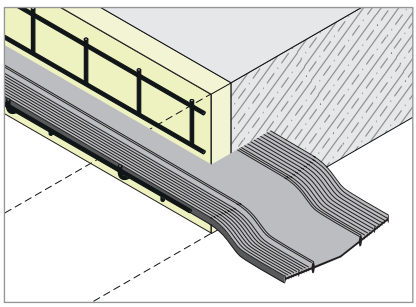
In-situ concrete walls



Prefabricated element walls



Floor and ceilings



Stremaboard

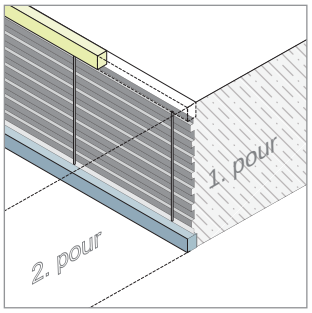
Stremaboard consists of a profiled, lightweight expanded metal. The profile satisfies the requirements of DIN 1045-1 and/or Eurocode 2 so that construction joints produced with Stremaboard must be classified indented joints.

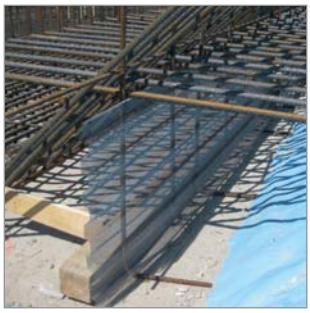
Stremaboard

Art. no.	Length mm	Width mm	Pieces/pallet	Weight kg/pallet
PV2020	2400	800	100	584

Other concrete covers available upon request.

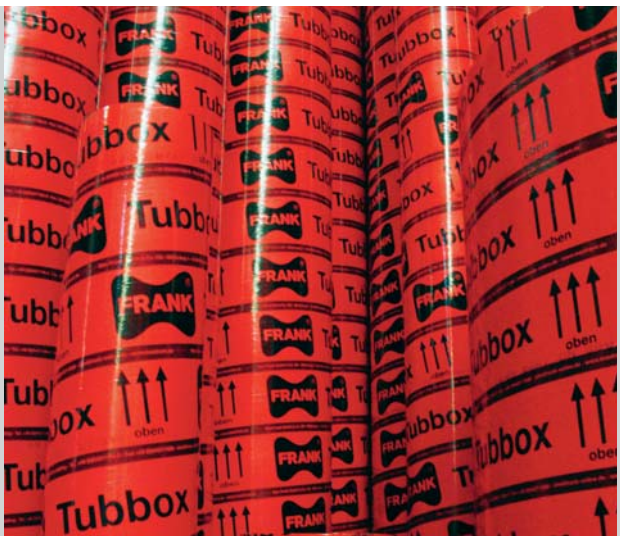
Stremaboard is ideal for shuttering smaller construction joints. It can be cut to size easily on site and, thus, is suitable for individual adaptation to construction joints. The corrugation provides the material with a good longitudinal bracing; vertical bracing is implemented by the customer.





Tubbox® column formers

- Faster progress on site: installation and stripping just cannot be done quicker
- Light and easy to handle during transport and erection
- Economical: cleaning and return of formwork not required
- Multiple columns formed in one concrete pour
- No release agent necessary
- Simple disposal as recyclable (cardboard) waste
- Formwork in accordance with the requirements of the instructions sheet for exposed concrete, exposed concrete class SB3

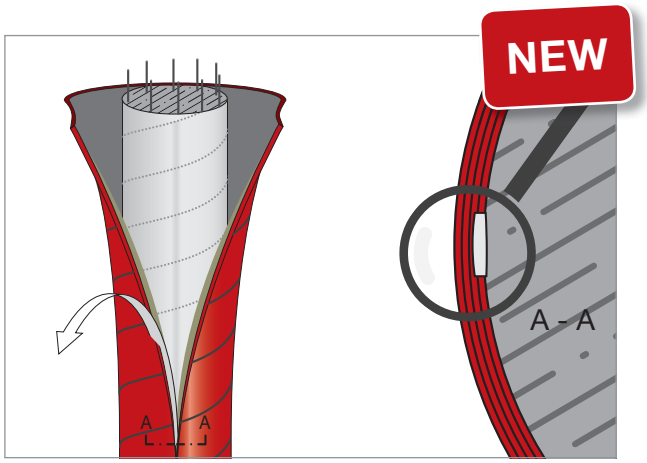


For Tubbox® column formwork, please select the surface finish in accordance with your requirements.

The new development of the wall-integrated ripping cord results in a nearly smooth concrete surface for **“Spiral Plus”**.

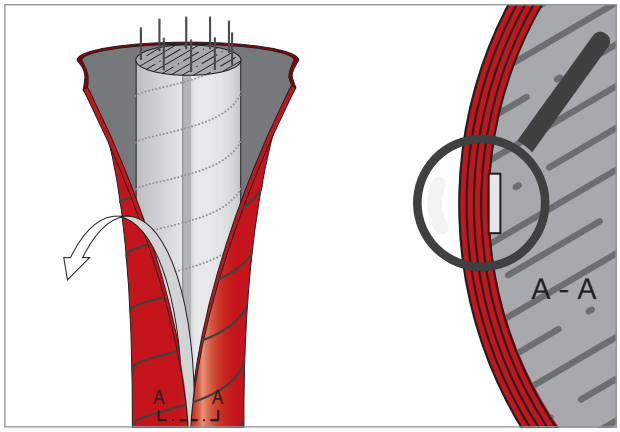
The vertical outline of the ripping cord unavoidable up to now and disturbing from a visual point of view is largely avoided.

The innermost layer of the construction core winding possibly remaining at the concrete surface can be removed in a quick and easy manner.



Spiral Plus

“Spiral” version: concrete surface quality with standard finish and slight imprinting of spiral former.



Spiral

Tubbox® formwork tube is supplied for columns of different geometrical designs:
round, square, rectangular, or as special shape (as a standard, all edges of square formwork systems are bevelled).
Fratec® formwork elements for capitals and column bases complement the range of Tubbox® column formers.
Tubbox® Multi circular column formers are especially suitable for the production of multiple new columns of the same diameter as well as for the redevelopment of old columns.

Tubbox® and Fratec® formwork is inspected before despatch and leaves our premises in perfect condition. Transport damages or any other defects have to be marked on the shipping documents upon receipt of the goods. Our guarantee only covers those defects which are marked on the shipping documents immediately upon receipt of the goods.

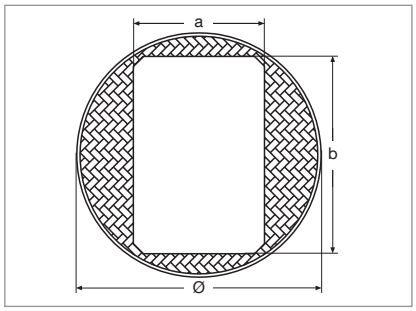
Tubbox® formwork for circular columns

	Designation	Art. no.	Internal pipe diameter mm	Concrete required m^3/m	Concreting rate metres/hour	Weight kg/m
	Spiral Plus: With wall-integrated ripping cord without disturbing vertical outline on the concrete surface. Familiar concrete surface quality with normal blowhole pattern and slight outline of the spiral-shaped winding structure of the casing pipe.	SRP150	150	0.019	6	1.54
		SRP200	200	0.033	6	1.90
		SRP240	240	0.048	6	2.20
		SRP250	250	0.052	6	2.30
		SRP300	300	0.074	6	2.60
		SRP350	350	0.101	6	3.40
		SRP400	400	0.132	5	4.87
		SRP450	450	0.167	4	5.60
		SRP500	500	0.206	3	6.88
		SRP550	550	0.249	3	7.90
	“Spiral” version: concrete surface quality with standard finish and slight imprinting of spiral former.	SRS600	600	0.297	3	9.20
		SRS650	650	0.348	3	11.00
		SRS700	700	0.404	3	12.60
		SRS750	750	0.463	3	14.25
		SRS800	800	0.528	3	15.90
		SRS900	900	0.668	2	17.20
		SRS1000	1000	0.825	2	26.60
		SRS1100	1100	0.998	2	30.80
		SRS1200	1200	1.188	2	35.00
	“Lined” version: Smooth concrete surface quality with minimal blowholes in the finished surface, but imprint of the insert joint. For former diameters exceeding 600 mm, two vertical butt-joints of the former inserts will be visible.	SRG150	150	0.019	6	1.80
		SRG200	200	0.033	6	2.25
		SRG240	240	0.048	6	2.62
		SRG250	250	0.052	6	2.74
		SRG300	300	0.074	6	3.12
		SRG350	350	0.101	6	4.01
		SRG400	400	0.132	5	5.75
		SRG450	450	0.167	4	6.58
		SRG500	500	0.206	3	7.97
		SRG550	550	0.249	3	9.10
		SRG600	600	0.297	3	10.51
		SRG650	650	0.348	3	12.13
		SRG700	700	0.404	3	13.82
		SRG750	750	0.463	3	15.74
		SRG800	800	0.528	3	17.66
		SRG900	900	0.668	2	19.16
		SRG1000	1000	0.825	2	28.78
		SRG1100	1100	0.998	2	33.20
		SRG1200	1200	1.188	2	37.62
	“Blowhole-free”: Highest surface hardness of concrete cover, largely free of blowholes. For more detailed information, please refer to the Zemdrain® section. Colour differences in the concrete, visible on stripping the formwork, will disappear in a few days.	SRL150	150	0.019	6	1.70
		SRL200	200	0.033	6	2.12
		SRL240	240	0.048	6	2.46
		SRL250	250	0.052	6	2.57
		SRL300	300	0.074	6	2.92
		SRL350	350	0.101	6	3.78
		SRL400	400	0.132	5	5.30
		SRL450	450	0.167	4	6.09
		SRL500	500	0.206	3	7.42
		SRL550	550	0.249	3	8.50
		SRL600	600	0.297	3	9.85
		SRL650	650	0.348	3	11.70
		SRL700	700	0.404	3	13.36
		SRL750	750	0.463	3	14.63
		SRL800	800	0.528	3	16.77
		SRL900	900	0.668	2	18.17
		SRL1000	1000	0.825	2	27.68
		SRL1100	1100	0.998	2	31.99
		SRL1200	1200	1.188	2	36.30

Tubbox® seamless

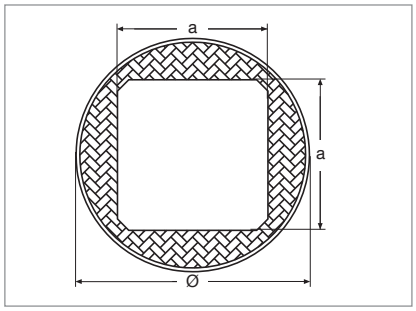
On the basis of the “Spiral Plus” design with wall-integrated ripping cord and additional interior coating Tubodur applied to the entire surface, you will obtain a largely seamless concrete surface quality without distinct horizontal and vertical seams.

Up to Ø 550 mm and any length – delivery time and price upon request.



Tubbox® formwork for rectangular columns

Art. no.	Dimension a x b mm	External tube diameter mm	Concrete required m³/m	Concreting rate metres/hour	Weight kg/m
SRR175240	175 x 240	306	0.044	6	3.49
SRR200240	200 x 240	306	0.050	6	3.34
SRR200250	200 x 250	357	0.053	6	4.75
SRR200300	200 x 300	408	0.063	6	6.74
SRR200350	200 x 350	408	0.074	5	6.49
SRR200400	200 x 400	510	0.084	3	10.08
SRR240300	240 x 300	408	0.076	5	6.44
SRR240350	240 x 350	459	0.088	4	7.73
SRR240360	240 x 360	459	0.091	4	7.67
SRR240365	240 x 365	459	0.092	4	7.64
SRR240400	240 x 400	459	0.101	4	7.43
SRR240450	240 x 450	561	0.113	3	11.48
SRR240500	240 x 500	612	0.126	3	13.65
SRR250300	250 x 300	408	0.079	5	6.36
SRR250350	250 x 350	459	0.092	5	7.65
SRR250400	250 x 400	510	0.105	3	9.58
SRR250500	250 x 500	612	0.131	3	13.53
SRR300350	300 x 350	459	0.110	4	7.21
SRR300400	300 x 400	510	0.126	3	9.08
SRR300450	300 x 450	561	0.142	3	10.80
SRR300500	300 x 500	612	0.158	3	12.90
SRR350400	350 x 400	561	0.147	3	10.68
SRR400500	400 x 500	663	0.210	3	14.73



Tubbox® formwork for square columns

Art. no.	Dimension a x a mm	External tube diameter mm	Concrete required m³/m	Concreting rate metres/hour	Weight kg/m
SRQ150150	150 x 150	206	0.024	6	2.27
SRQ200200	200 x 200	306	0.042	6	3.54
SRQ240240	240 x 240	356	0.060	6	4.55
SRQ250250	250 x 250	356	0.066	6	4.43
SRQ300300	300 x 300	408	0.095	5	5.99
SRQ350350	350 x 350	510	0.129	4	9.02
SRQ360360	360 x 360	510	0.136	4	8.84
SRQ400400	400 x 400	561	0.168	3	10.18
SRQ450450	450 x 450	663	0.213	3	14.66
SRQ500500	500 x 500	714	0.263	3	16.46

Other sizes and shapes to order. All versions are supplied with rip cord.

For Tubbox® formwork for square and rectangular columns, the sleeve liners are butt-jointed at lengths of more than 5.0 m. Slight imprinting of the butt-joint in the concrete cannot be avoided.

There is a 10 % surcharge for shorter lengths between 1.0 m and 2.0 m, and for lengths < 1.0 m a 20 % surcharge is applied. The minimum length is 0.4 m.

Oversize lengths: A surcharge of 10 % is applied for lengths of more than 6.0 m.

Please clarify production and transport details when placing the order. There are three versions of more than 6 meteres:
a) Formwork tube and/or jacket tube in one piece, delivery time 6 days.
b) Formwork tube and/or jacket tube butt-jointed ex factory, max. individual length 6.0 m.
For round supports, the butt-joining can be seen slightly on the concrete.
c) Formwork tube and/or jacket tube to be butt-jointed on site. Only recommended if butt-jointing ex factory is not possible for transport or other reasons. The butt joint can be seen on the concrete.

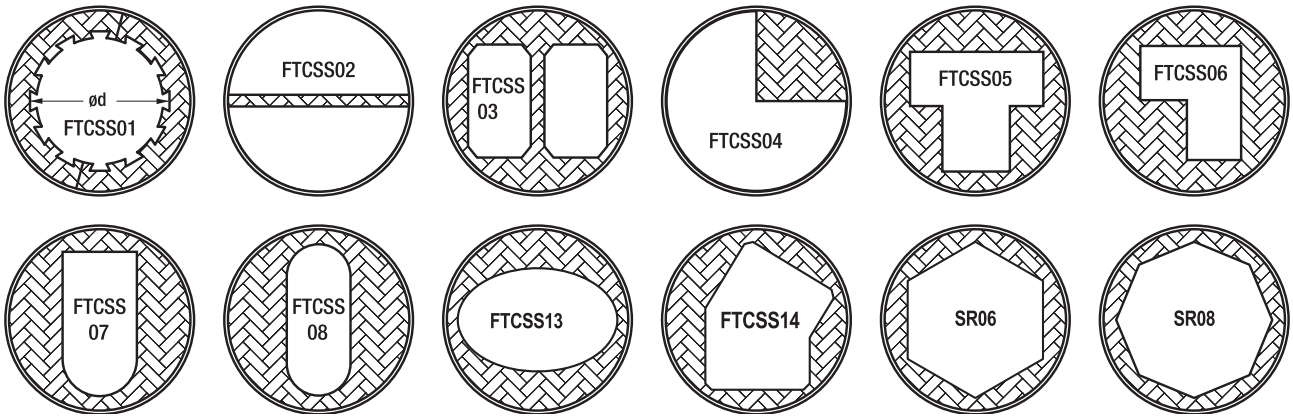
Length tolerance -0.0 + 2.5 cm

FRANK column formers allow for producing geometrical shapes with virtually no limits.

Column formwork for virtually any cross section, including conical shapes, can be produced to your drawings at short notice.

Please call us – we look forward to assisting you.

Examples for special designs:

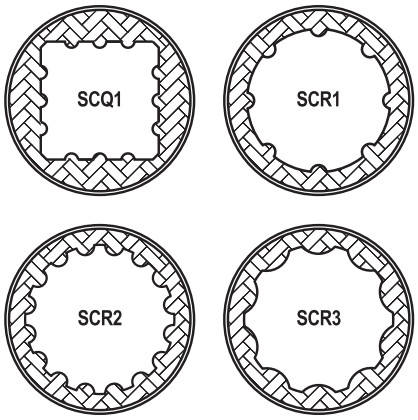


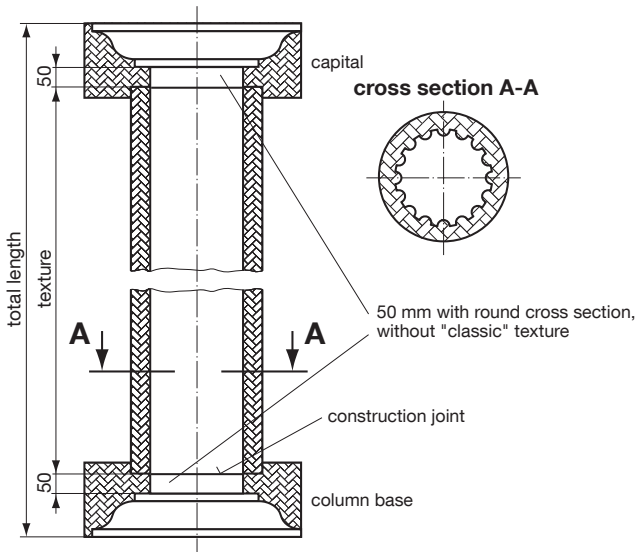
Full of character and versatile

Light and shadow effect of a structure surface makes a feature of the character of the component “Support”.

Use the “Board” relief replica or one of our “Classic” structures for the design of the columns.

„Classic“ structures:





Tubbox® supporting brace (without props)

Suitable for vertical alignment of column formers

Designation	Art. no.	Weight kg/pce.
Size I for column formers Ø 200 – 600 mm – type bracket, tension belt with ratchet and 3 forks	SRZS200	2.30
Size II for column formers Ø > 600 mm – type bracket, tension belt with ratchet and 3 forks	SRZS600	2.50
Additional thread nipple for connection of a fourth prop	SRZSGST	0.43
Size I for column formers Ø 200 - 600 mm – type bracket, tension belt with ratchet and 3 forks	SRZSGEW200	2.40
Size II for column formers Ø > 600 mm – type bracket, tension belt with ratchet and 3 threaded steel rods	SRZSGEW600	2.60
Additional thread nipple, for connection of a fourth prop	SRZSGEW	0.45
Fabric-reinforced adhesive tape 50 mm x 50 m, for sealing column former joints when butt-jointed on site and for repairing damaged column former surfaces	SRKBANDG	0.52

Instructions for using Tubbox® special circular column formers

Transport

- Always transport the cores on a level surface supported over their entire length to avoid pressure points.
- Protect cores from abrasive loading.
- Protect cores against heat, rain and moisture - do not place into puddles
- Protect accidentally damaged surfaces against moisture with an adhesive tape.
- Tubbox® is produced to ISO/DIN 9001, inspected and dispatched in perfect condition. Transport damages or other defects must be noted on the delivery note upon receipt of the goods. Our warranty only covers defects that are noted on the delivery note immediately after arrival of the goods.

Assembly

- Do not force the formwork tubes over reinforcement or spacers that are bent too far. Any protruding spacers and reinforcement will damage the formwork and will force the formwork into an oval shape.

Further information about Tubbox® and Fratec® can be found in our brochure at www.maxfrank.com

Tubbox® Multi special circular column formers for multiple use

Tubbox® Multi circular column formers are especially suitable for the production of multiple new columns of the same diameter as well as for the redevelopment of old columns.

Benefits:

- Repeat use saves money
- High surface quality, similar to Tubbox® "lined version"
- Only one lengthwise joint on the circumference
- Low freight and storage volume
- Light weight aids transport and handling on site
- One type of tightener suitable for all diameters
- Easy to shorten on site
- Easy stripping
- Little waste caused during shuttering works

Vertical fixing is achieved by means of props arranged at head pieces and tension belts specially designed for this purpose.

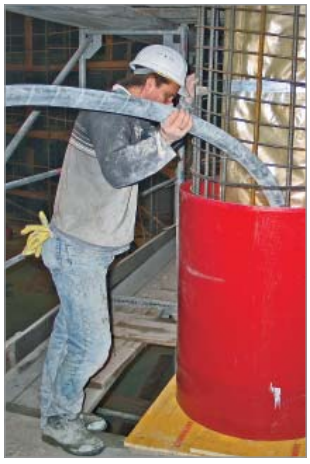
Column formers prepared for another application with head pieces and tension belts already mounted.

Tubbox® Multi special circular column formers for the repair of existing columns

Benefits in renovation applications:

- Tubbox® Multi solves the problem of encasing columns between slabs and capitals.
- Suitable for retrospective widening of existing columns in old buildings where the slab is in place
- Easy handling in closed buildings
- Suitable for encasing steel columns
- Visual improvement of existing columns is achievable
- Enhanced structural stability

Tubbox® Multi encasing an existing column attached to a girder being filled with concrete.



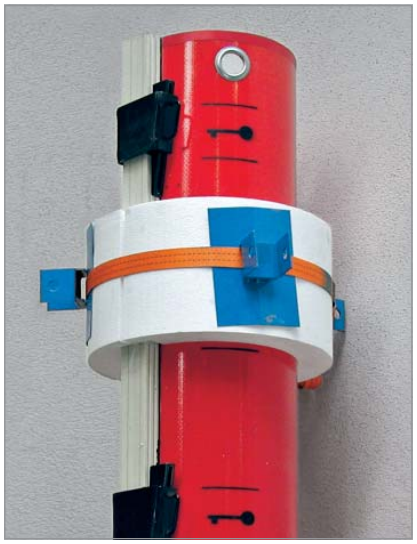
Tubbox® Multi for the encasement of existing columns. Concreted in two pours.

Tubbox® Multi special circular column formers

for multiple use

Art. no.	Internal pipe diameter mm	Delivery dimension width x tube length m	Concreting rate metres/hour	Weight kg/m
SRM250	250	0.79 x ...	5	4.32
SRM300	300	0.94 x ...	5	4.36
SRM350	350	1.10 x ...	5	4.41
SRM400	400	1.26 x ...	4	4.46
SRM450	450	1.41 x ...	4	4.50
SRM500	500	1.57 x ...	3	4.55
SRM550	550	1.73 x ...	3	4.60
SRM600	600	1.88 x ...	3	4.65
SRM650	650	2.04 x ...	2.5	4.69
SRM700	700	2.20 x ...	2	4.74
SRM800	800	2.51 x ...	2	4.83

Delivery time: 5 working days.
Other diameters can be supplied on request. Maximum length available is 8.0 m.
Surcharge for shorter lengths: 10 % from 0.5 to 1.0 m, 20 % from 0.3 to 0.5 m, lengths, < 0.3 m price on request.



Tubbox® Multi mounting aids

Art. no.	description
SRMMH	for column former Ø 250 – 500 mm
SRMMH550	for column former Ø 550 – 800 mm

3 installation eyes to facilitate vertical fixing by crane in a 100 mm extension of the former

Tubbox® Multi head pieces

for fixing the supporting brace, tension belt with ratchet, see page 49.

Art. no.	Internal pipe diameter mm	Weight kg/pce.
SRMKT250	250	0.67
SRMKT300	300	0.78
SRMKT350	350	0.89
SRMKT400	400	1.00
SRMKT450	450	1.11
SRMKT500	500	1.22
SRMKT550	550	1.32
SRMKT600	600	1.48
SRMKT650	650	1.58
SRMKT700	700	1.69
SRMKT800	800	2.12

Tubbox® Multi tighteners

Art. no.	Recommended usage pieces/metre	Weight kg/pce.
SRMSS1	3	1.65

3 tighteners per metre are required to close the column formers Tubbox® Multi Ø up to 500 mm, for Ø beyond 500 mm 3.5 tighteners per metre are required.

Tubbox® Multi fixing of column formers at foot point

Art. no.	Internal pipe diameter mm	Weight kg/pce.
SRMFP250	250	0.47
SRMFP300	300	0.61
SRMFP350	350	0.76
SRMFP400	400	0.92
SRMFP450	450	1.11
SRMFP500	500	1.22
SRMFP550	550	1.53
SRMFP600	600	1.76
SRMFP650	650	2.01
SRMFP700	700	2.28
SRMFP800	800	2.86

Fratec® – the formwork that matches your creativity

Fratec® gives you the ability to create and realise both variety and expression in formwork design. It enables architects and designers to put their creative ideas into practice. Using your dimensioned drawings our technical advisory staff will work with you in order to transform your vision into reality.

Our Fratec® formwork can be quickly produced to your drawings.

Fratec® special designs

- Profiled forms inserted into structural formwork
- Unlimited design options for visual impact in architecture
- More choice in cantilevered structural building elements
- Texture of concrete surface

Fratec® formwork for recesses

- Ready to use complete formwork
- Used in addition to the conventional formwork on site
- Free architectural design unrestricted by formwork limitations
- Quick and easy assembly of formwork
- Formwork systems conforming to the data sheet for Class SB2 exposed concrete

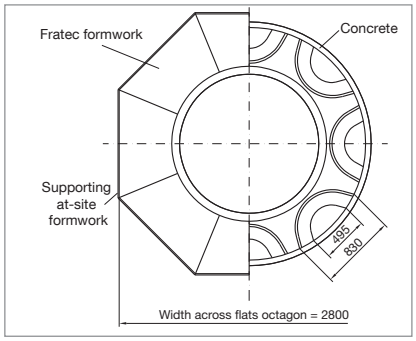
Fratec® formwork for cornices

- Formwork with your desired design, ready for installation
- Identical shape for circular column, formwork and cornices
- Identical shape with various dimensions possible
- Can be supplied as semi-precast balcony formwork
- Slab and cornices are produced in one concrete pour
- Formwork systems conforming to the data sheet for Class SB3 exposed concrete

Tubbox® and Fratec® formwork is inspected before despatch and leaves our premises in perfect condition. Transport damages or any other defects have to be marked on the shipping documents upon receipt of the goods. Our guarantee only covers those defects which are marked on the shipping documents immediately upon receipt of the goods.

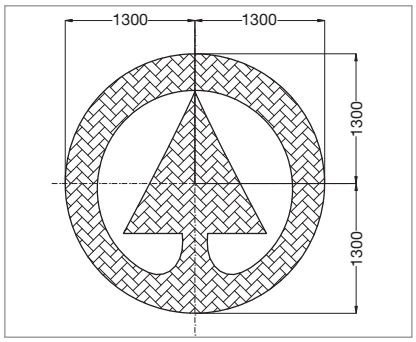
Fratec® special designs

Formwork for all special designs



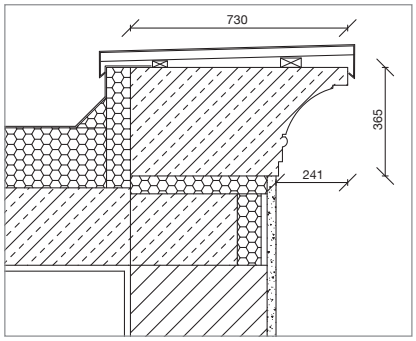
Fratec® formwork for recesses

Special formwork elements with recesses for individual designs and signs



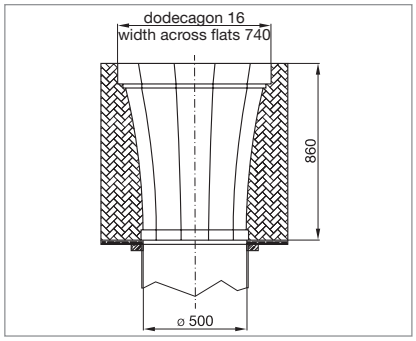
Fratec® formwork for cornices

Cornices with special profiles, also in connection with capitals



Fratec® formwork for column capitals and bases

Column capitals and bases in various round or polygonal shapes

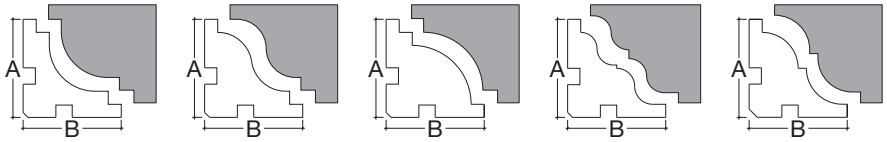


Fratec® – the profile formwork for cornices

Whether roof or circumferential wall cornices for internal or external use – use the Fratec® special formwork for a unique face of the facade.

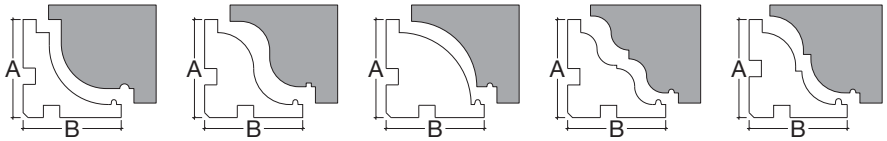
Fratec® cornice formwork for internal applications

(without weather drip)

Shape	Art. no.	A x B mm
 Shape 1 Shape 3 Shape 4 Shape 7 Shape 8	FTCGSO1	270 x 270
	FTCGSO2	270 x 165
	FTCGSO3	120 x 120

Fratec® cornice formwork for external applications

(with weather drip)

Shape	Art. no.	A x B mm
 Shape 1 Shape 3 Shape 4 Shape 7 Shape 8	FTCGSM1	270 x 270
	FTCGSM2	270 x 200
	FTCGSM3	120 x 120

Other designs are available on request.
Standard length 2.0 m
Surcharge for cut lengths.
Delivery time:
Cornice formwork 120 x 120 mm is available immediately.
For any other sizes the delivery time is 5 working days.

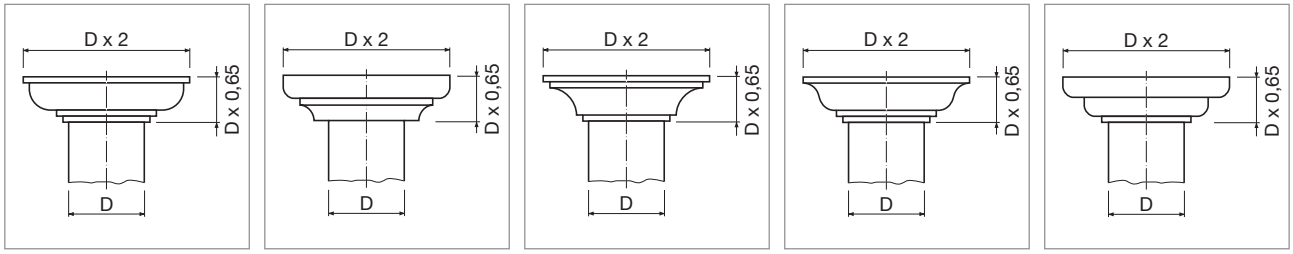
Fratec® formwork for cornices – prices for cut lengths

art. no.	designation
FTCSCHZK	Cut length < 2.0 m
FTCSCHZL	Cut length > 2.0 m
FTCSCHZSG	Cutting price per corner (2 cuts necessary)

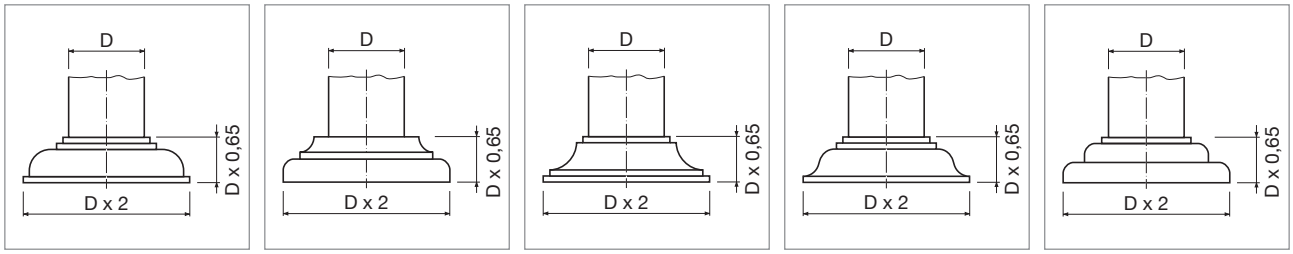
Fratec® dimensional letters of the relevant year

	designation	art. no.	Dimensions mm	Weight kg/pce.
	Year numbering for multiple use made of permanently flexible polyurethane according to recommended marking BMVBW “year 1”	FTCJAHR12	255 x 455	1.10

Fratec® formworks for capitals and column bases



Shape 10 | Shape 16 | Shape 17 | Shape 18 | Shape 20



Fratec® formwork for capitals – Art. no. FTCKP

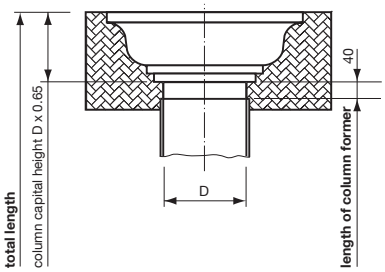
Diameter	Price €/pce.				
mm	Square	Hexagonal	Octagonal	round, one-piece	round, two-piece
200					
250					
300					
350					

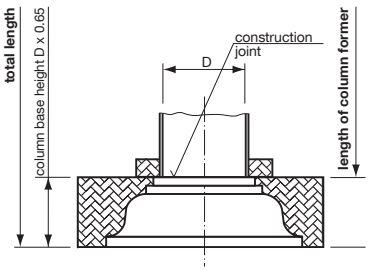
Fratec® formwork for column bases – Art. no. FTCSF

Diameter	Price €/pce.				
mm	Square	Hexagonal	Octagonal	round, one-piece	round, two-piece
200					
250					
300					
350					

Prices applicable to shapes shown above.
Delivery time is 5 working days
Other shapes and sizes can be supplied on request.
“Round” base / capital formwork versions can be supplied as single or two part components.
The one piece component is for single use only and leaves no vertical joint mark.
After stripping, cleaning and application of concrete release agent using the cloth provided, the two-component version may be used twice - provided that it is handled with care on site.
A construction joint is to be formed at the upper edge of the column base.
Column and capital are produced in one concrete pour.
The surface finish types for “round” and “angled” base versions differ slightly from each other.
The surface finish produced with Tubbox® column former differs slightly from the surface finish obtained with Fratec® column base or capital formwork.

Determination of column former length





Data required with the order

Pos.	Column base/ column capital	Shape	Design versions square, hexagonal, octagonal, round one-piece, round two-piece	Column Ø

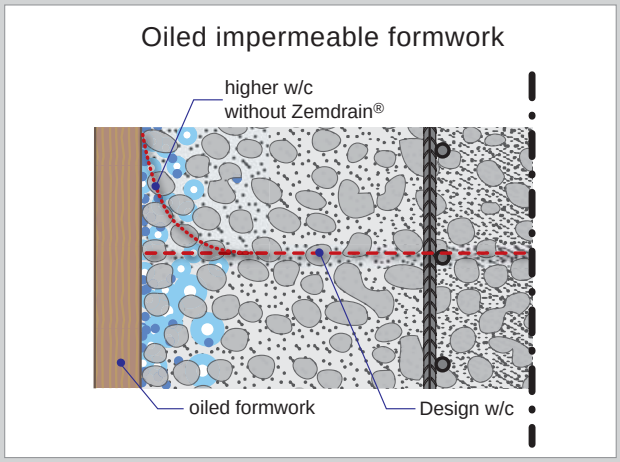
Zemdrain® – the CPF liner supplied in rolls for improvement of the surface quality of concrete.

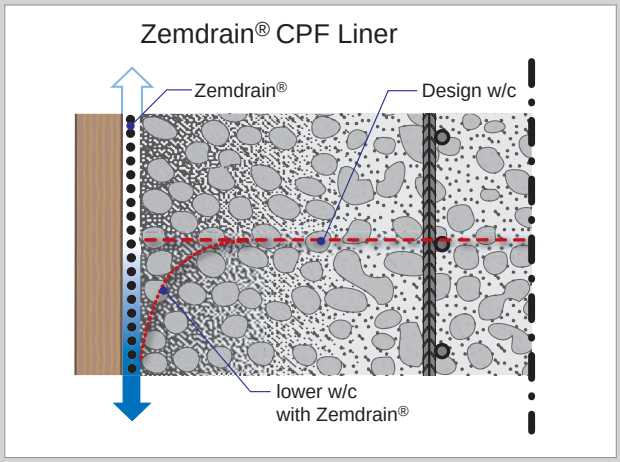
Preventing future durability problems now.

Zemdrain® use improves the quality and design life of any type of concrete structural element.

The benefits of Zemdrain® at a glance

- Reduced surface water/cement ratio
- Virtually blowhole free, smooth surface
- Release agents not used
- High surface durability
- Reduced surface abrasion
- Improved resistance to freeze/thaw action
- Reduced microbiological growth and improved hygiene
- Reduced carbonation
- Reduced depth of ingress of water and chlorides
- Proven cost savings during total useful life (Institute for Domestic Water Supplies Hanover)



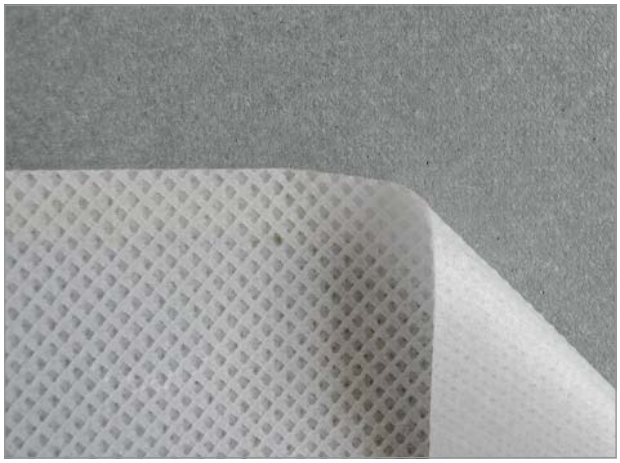


The problem

During compaction oiled impermeable faced formwork traps excess air and water at the concrete/formwork interface. This results in an increased surface w/c ratio with increased porosity and permeability reducing the durability of the concrete.

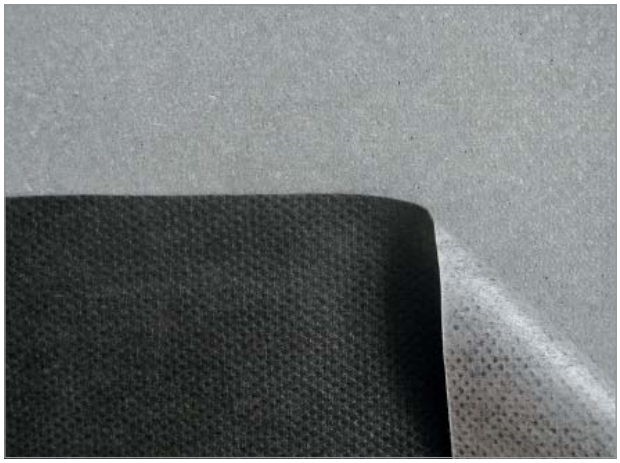
The solution

Zemdrain® CPF liners drain excess air and water from the surface of the concrete. This reduces the w/c ratio in the outer 20 mm of the surface to nearly optimum values and virtually eliminates blowholes. The resulting concrete has increased resistance to all aggressive elements.



Zemdrain® MD and MD self-adhesive

- Smooth to slightly textured, white surface (concrete side)
- Rear side (formwork side) with special draining grid
- Roll dimensions: Width 2.5 m and length 35 m
- Very economic because of the possibility of repeated use (2 - 3 times), simple and quick assembly
- High water storage capacity, therefore also suited for inclined or horizontal surfaces
- Also available in self-adhesive version for easy application to steel or plastic forms



Zemdrain® Classic

- Smooth or slightly textured, grey upper surface (concrete side)
- Rear side (formwork side) black and rhomb shaped recesses
- Roll size: 1.6 m - 5.2 m width and 50 m length
- For covering large surfaces
- For single use
- For special applications, e.g. when round steel formwork is used in monolithic construction

Steel frame formwork completely covered with Zemdrain® MD

Prefabricated lengths of Zemdrain® Classic for lining of circular steel formwork.

We offer you a varied range of accessories for simple covering of formwork elements with Zemdrain®.

For more information on Zemdrain® formliners please consult our brochure and the relevant application guidelines – ask for a free-of-charge copy or download free-of-charge from our website www.maxfrank.com.

For questions regarding the surface cover of special formwork systems kindly get in contact with our technical advisory service.

Zemdrain® Classic

Controlled permeability formliner

	Art. no.	Roll width m	Roll length m	m²/roll	Weight kg/roll
	ZEM1600	1.60	50	80.00	27.75
	ZEM1900	1.90	50	95.00	33.00
	ZEM2250	2.25	50	112.50	39.00
	ZEM2600	2.60	50	130.00	45.00
	ZEM2900	2.90	50	145.00	50.00
	ZEM3200	3.20	50	160.00	55.00
	ZEM4000	4.00	50	200.00	70.00
	ZEM4500	4.50	50	225.00	78.00
	ZEM5200	5.20	50	260.00	89.00

Special widths on request, please note minimum quantities and delivery times.

Zemdrain® MD

Controlled permeability formliner

	Art. no.	Roll width m	Roll length m	m²/roll	Weight kg/roll
	ZEMMD2	2.50	35	87.50	59.00

Can be used twice, saving more than 50% of the costs,
Width tolerance ± 1 cm

Zemdrain® MD self-adhesive

Controlled permeability formliner

	Art. no.	Roll width m	Roll length m	m²/roll	Weight kg/roll
	ZEMMD2	2.50	35	87.50	63.00

Can be used twice, saving more than 50% of the costs,
Width tolerance ± 1 cm

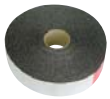
Zemdrain® cuts

Designation	Art. no.
Cutting to length rolls to reduce the roll lengths, individual delivery – minimum length 3 m, specify delivery as a whole when ordering. Cutting tolerance ± 5 cm.	ZEMSCHNITTQ
Cutting of the complete rolls to reduce the roll widths. Rest of roll width is invoiced and can be supplied, if required. Cutting tolerance ± 2 cm.	ZEMSCHNITTL
Finishing of the Zemdrain® formwork liners for round containers (consisting of ZEMSONDER, ZEMKONFEKT and ZEMRUEST)	ZEMSONDER

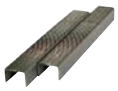
Zemdrain® Kleberex

	Designation	Art. no.
	Cleaning agent for removing adhesive residues on formwork when using Zemdrain® MD self-adhesive	ZKLEX

Zemdrain® accessories

	Designation	Art. no.
	Special double-sided adhesive tape 50 mm x 0.5 mm – 50 lin.m. adhesive on both sides for fixing Zemdrain® formwork liners. Not suitable for use in drinking water applications.	ZDSSKB
	MD-fixing tape 50 mm x 1.0 mm – 10 lin.m/roll; double-sided adhesive tape, white, for fixing and sealing of Zemdrain® MD to formwork (it is possible that some isolated small blowholes will occur in the vicinity of the adhesive tape due to the impermeability of the adhesive film). Not suitable for use in drinking water applications.	ZBBAND
	Zemdrain® cover tape 50 mm x 0.5 mm – 10 lin.m.; Zemdrain® laminated self-adhesive tape for covering formwork joints, stapled Zemdrain® joints, for repair of any damaged Zemdrain® or for edge coverage of lined used formwork elements (it is possible that some isolated small blowholes will occur in the vicinity of the adhesive tape due to the impermeability of the adhesive film). Prior to use in drinking water applications kindly contact our application techniques department first.	ZABAND
	Zemdrain® cover tape 50 mm – 30 lin.m. For covering formwork joints in the drinking water area, attachment with staples.	ZEBAND
	Zemdrain® pre-fixing tape 50 mm x 2 mm – 30 lin.m. For sealing formwork joints and formwork element joints. Not suitable for use in drinking water applications	ZVBAND
	Foamed plastic joint tape 19 mm x 6 mm – 10 lin.m. For covering formwork joints. Not suitable for drinking/potable water and reservoir applications.	FKBANDS

Tools for working with Zemdrain®

	Designation	Art. no.
	Tensioning clamp, wide-area clamping and tensioning of Zemdrain® Classic across smaller formwork areas. Fix subsequently using staples.	ZSZKAZ
	Tensioning clamp MD 2.5 m, two-piece tensioning clamp for Zemdrain® MD	ZSZMD2500
	Adjustable stapler, manually operated, for fixing Zemdrain® MD to formwork surfaces. Uses 8 & 10 mm staples	ZTAKMD1
	Spare staples Monel 053-10 mm long, 1200 pcs./pack for plywood softwood	ZTEK10
	Pressure roller for Zemdrain® MD self-adhesive formwork liner	ZGROLL

Zemdrain® Classic tensioning tool

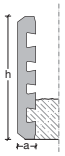
	Designation	Art. no.	Weight kg/pce.
	Tensioning device for fixing of Zemdrain®	ZSL0810	7.00

Also for rent – please ask us.

Permanent edging formwork made of extruded fibre concrete

- Permanent edging formwork as lost formwork in semi-finished concrete elements
- For use with wall and slab elements
- Reusable plastic weather drip former
- The weather drip former gives a smooth line
- Only suitable for being used in the field of exposed concrete upon previous consultation

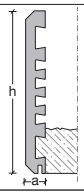
Permanent edging formwork standard element type “S”



Art. no.	Dimensions h x a mm	Length m	Weight kg/m	Pieces/pallet	Weight kg/pallet
AKF1602700	160 x 25	2.70	6.48	56	1040
AKF1802700	180 x 25	2.70	7.04	56	1124
AKF2002700	200 x 25	2.70	7.78	56	1236
AKF2202700	220 x 25	2.70	8.52	56	1348
AKF2402700	240 x 25	2.70	9.52	56	1499
AKF2502700	250 x 25	2.70	10.00	56	1572
AKF3002700	300 x 25	2.70	12.22	28	984
AKF3652700*	365 x 25	2.70	13.17	28	1056

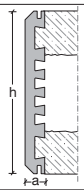
Also available in standard length 2.0 m.
Other lengths and dimensions upon request.
*Delivery time upon request.

Upstand ceiling type “D” with one sealing rail



Art. no.	Dimensions h x a mm	Length m	Weight kg/m	Pieces/pallet	Weight kg/pallet
AKF1602700D	160 x 25	2.70	7.22	50	1035
AKF1802700D	180 x 25	2.70	8.15	50	1160
AKF2002700D	200 x 25	2.70	9.26	50	1310
AKF2202700D	220 x 25	2.70	9.63	50	1360
AKF2402700D	240 x 25	2.70	11.00	50	1545
AKF2502700D	250 x 25	2.70	11.30	50	1585
AKF3002700D	300 x 25	2.70	13.52	25	973

Upstand wall type “W” with two sealing rails



Art. no.	Dimensions h x a mm	Length m	Weight kg/m	Pieces/pallet	Weight kg/pallet
AKF2002700W	200 x 25	2.70	8.89	50	1260
AKF2202700W	220 x 25	2.70	9.26	50	1310
AKF2402700W	240 x 25	2.70	10.75	50	1510
AKF2502700W	250 x 25	2.70	11.05	50	1550
AKF3002700W	300 x 25	2.70	13.52	25	973

Accessories for permanent edging formwork

	Designation	Art. no.
	Plastic weather drip former for upstand, length 2.5 m, dimensions 10 x 31 x 10 mm.	AKFAP2500

Extra cut charge to be added up to price per metre

Cutting length	for 90° cut	for 89° – 45° cut
As of 20 cm	10%	30%
15 – 19.9 cm	20%	30%
10 – 14.9 cm	30%	30%

Extra charge for longitudinal cut: 15 % on price per metre

Shutter panels made of fibre concrete

- Economy - no formwork erection and stripping
- No escape of the concrete laitance at sloppy formwork joints
- Ideal connection to the in-situ concrete
- Dimensionally stable

Shutter panels made of fibre concrete

used as floor-edge formwork and for covering formwork joints in concrete constructions

Art. no.	Dimensions h x a mm	For wall thickness cm	Weight kg/m	Pieces/pallet	Weight kg/pallet
FBSB2001200	200 x 20	13	7.20	175	1532
FBSB2501200	250 x 20	18	9.60	150	1748
FBSB3001200	300 x 20	20	10.00	100	1220
FBSB3501200	350 x 23	25	14.00	80	1364
FBSB4001200	400 x 23	30	15.30	80	1489
FBSB4501200	450 x 23	34	18.80	50	1148
FBSB5001200	500 x 23	36	21.80	50	1328

Standard length is 1.20 m. Other dimensions upon request.
Not suitable for use in exposed concrete construction and/or only upon previous consultation.

Designation	Art. no.
Surcharge for drill holes up to Ø 6 mm	FBBOHR06
Surcharge for drill holes Ø 7 – 25 mm	FBBOHR25
Surcharge for drill holes Ø 25 mm	FBBOHR40

Extra cut charge to be added up to price per metre

Cutting length	for 90° cut	for 89° – 45° cut
As of 20 cm	20%	40%
15 – 19.9 cm	30%	40%
10 – 14.9 cm	40%	40%

Extra charge for longitudinal cut: 20 % on price per metre

Formwork element

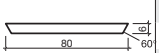
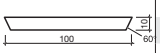
with bevel for the shuttering of edge beams of bridges

	Art. no.	Dimensions h x a mm	Length m	Weight kg/m	Pieces/pallet	Weight kg/pallet
	FBAP060	60 x 15	1.15	1.33	500	785
	FBAP080	80 x 15	1.15	2.11	500	1235
	FBAP100	100 x 15	1.15	2.31	400	1084
	FBAP120	120 x 15	1.15	2.66	300	938

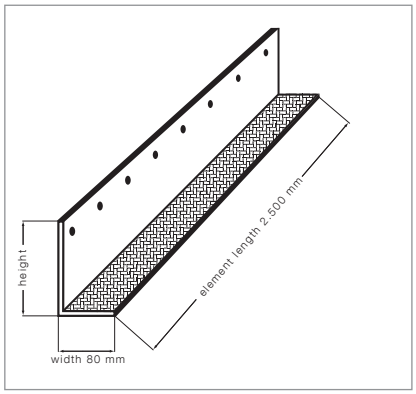
For cutting and drilling surcharges see shutter panel.

Joint sealing strips

made of fibre concrete with chamfered edges

	Art. no.	Thickness approx. mm	Length mm	Weight kg/m	Pallet unit m	Weight kg/pallet
	FSS060	6	1200	0.65	1500	995
	FSS100	10	1200	1.81	480	888

- Good bonding with concrete
- Chamfered edges
- For covering formwork joints
- Concrete coloured - light grey

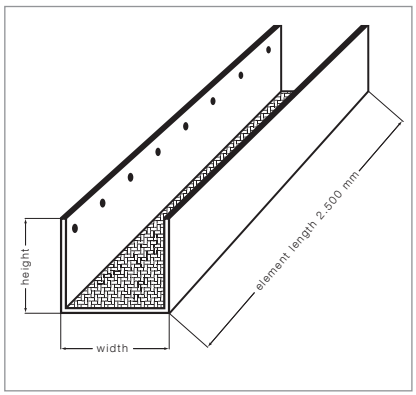


Floor-edge forms

made from high pressure, cement-bonded chipboard to DIN EN 13986

Art. no.	Width mm	Height h mm	Element length m	Pallet unit m	Pieces/ pallet	Weight kg/pallet
DEABHF80160	80	160	2.50	250	100	1070
DEABHF80180	80	180	2.50	250	100	1145
DEABHF80200*	80	200	2.50	250	100	1220
DEABHF80220*	80	220	2.50	200	80	1040
DEABHF80240*	80	240	2.50	180	72	992
DEABHF80250*	80	250	2.50	180	72	1028
DEABHF80300*	80	300	2.50	150	60	950

Special dimensions upon request.
* For heights over 200 mm, secure the floor-edge forms at the grouted anchor holes using binding wire.



Lintel shuttering

made from high pressure, cement-bonded chipboard to DIN EN 13986

Art. no.	Width mm	Height h mm	Element length m	Weight kg/pce.
STUKAHF175240	175	240	2.50	26.20
STUKAHF175300	175	300	2.50	30.70
STUKAHF200240	200	240	2.50	27.50
STUKAHF200300	200	300	2.50	32.00
STUKAHF240240	240	240	2.50	29.60
STUKAHF240300	240	300	2.50	34.10

Special sizes upon request – item no. STUKAHFSR.
Intermediate sizes are supplied at the price of the standard element of the next size up.
The number of re-usable anchor clamps required per element length is 5 pieces

Designation	Art. no.
Extra charge if supplied as formwork for ring beam shuttering for covering several joints in the floor slab	STUKARING

Material thickness

- Lateral pieces 10 mm
- Bottom piece 14 mm

Material category B1 – flame resistant (DIN4102-B1)

Material properties:

Drying and wetting on one side may result in bulging.
This is dependent on the material.

Formwork elements for lintel construction and floor-edge forms are produced with grouted anchor holes on the inside surface in order to ensure a good bond with the in-situ concrete.

Using lintel formwork reduces the cross section of the lintel and must be taken into account in calculating any structural requirements.

- Cost-efficient, permanent floor-edge components (No thermal insulation)
- Easy displacement with 2 component adhesive foam - concreting possible after approx. 2 hours

Anchor clamp

Art. no.	Anchor clamp for wall thickness mm	Carton contents piece	Weight kg/carton
RISVB175	175	30	8.90
RISVB200	200	30	9.20
RISVB240	240	30	10.00

Element connector

for jointing two faces

Art. no.	Length mm	Pack size piece	Weight kg/packaging
DEABFC1060	60	50	0.12

Adhesive foam

Designation	Art. no.	Pack size	Weight kg/pce.
Fast-hardening 2-component PU-foam, extended storage stability up to 2 years; can sufficient for approx. 10 m	DIS2KMS	12 cans/box	0.50

Fibre cement boards

Lost formwork - rotproof

- As complete boards
- Fibre cement panels cut to size as lost formwork between steel girders
- As a pre-assembled recess box

As building board

- For cladding of structural members

As a backing board

- For prefabricated building

Fibre cement boards

Art. no.	Size m	Thickness mm	Pieces/pallet	Weight kg/m²	Weight kg/pallet
FZP092500	2,5 x 1,2	9	50	16.60	2510
FZP122500	2,5 x 1,2	12	40	19.90	2408
FZP152500	2,5 x 1,2	15	32	24.90	2410
FZP182500	2,5 x 1,2	18	26	30.00	2360
FZP212500	2,5 x 1,2	21	22	34.90	2323

Tolerances:

- Panel dimensions ± 4 mm,
- Panel thickness + 20 % – 10 %

Packing:

Transport safe on single-use pallets, wrapped into foil

Cutting:

Panels can be cut to length based on the dimensions and thicknesses shown in the table. Price on application.

Panel material:

All panels are asbestos-free and cement-based. As with all cement-based materials, the panels can shrink or swell by up to 0.2 %, even when cured. Drying and wetting on one side only may result in distortion and is an inherent property of the material.

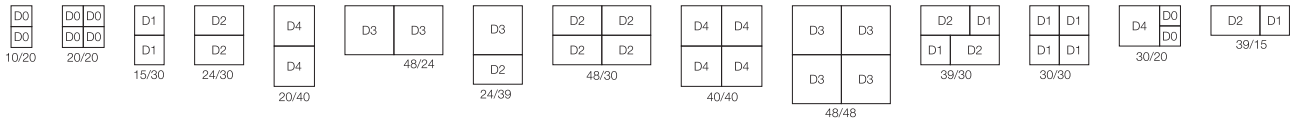
Storage and transport:

Always store and transport the panels on a level and dry surface supported over their whole length. In order to protect the panels against humidity, weathering and soiling they are completely wrapped into protective film. When taking out single panels, please make sure to re-cover and re-seal the pallet. The panels should always be carried in an upright position.

Box-out forms for slab apertures – economical, efficient, cost-saving

- High-quality coated cardboard, pressed and perforated in one sheet
- Strong due to internal stiffening
- Concrete cannot enter the void
- All types are 240 mm high
- Can be site-cut to reduce height, as required
- Easy stripping by pulling the hand holds on the cover
- For larger recesses, we recommend using our steel box-out shutters (see page 65)
- The opening becomes bigger by combining several box-out forms

Possible combinations:



Box-out forms for slab apertures

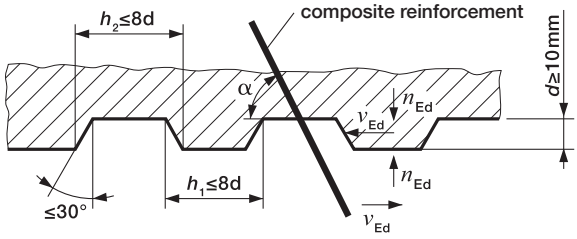
Art. no.	Type	Size (bottom part) cm	Carton contents piece	Weight kg/carton	Cartons/pallet	Weight kg/pallet
SBOXD0	D 0	10 x 10	50	9.00	20	200
SBOXD1	D 1	15 x 15	50	14.00	15	230
SBOXD2	D 2	15 x 24	50	19.00	15	305
SBOXD4	D 4	20 x 20	50	21.00	10	230
SBOXD3	D 3	24 x 24	50	26.00	10	280

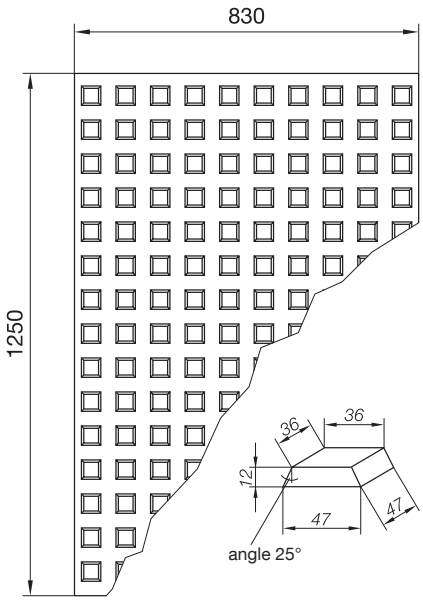
Joint profile former

made from plastic, 2 mm thick

Art. no.	Dimensions cm	Profile height mm
FFP12083	125 x 83	12

- Creates the optimum concrete surface for the absorption of shear forces in construction joints
- Replaces trapezoidal strips
- Can be used repeatedly
- Can be cut to size on-site
- The joint profile fulfils the requirements of the highest category “indented” according to DIN EN 1992-1-1 assuming a joint indented by 50%





Box-out shutters

Box-out shutter height cm		20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	Steel grille base
a x b cm	Wound-off length cm																			
20/20	80																			
25/25	100																			
30/30	120																			
35/35	140																			
40/40	160																			
45/45	180																			
50/50	200																			
55/55	220																			
60/60	240																			
65/65	260																			
70/70	280																			
75/75	300																			
80/80	320																			
85/85	340																			
90/90	360																			
95/95	380																			
100/100	400																			

Calculate prices for intermediate heights.
Box-out shutters unmounted including sheet metal screws.

Box-out shutter mounted, article number KSMONT
Box-out shutter unmounted, article number KSUMON

Benefits of the unassembled version:

- No freight and storage problems
- Easy transport to site
- Easy and quick assembly with the included self tapping screws using pre-drilled holes
- Due to shutter corners being pre-punched in the works, folding the shutter together is extremely simple

Self tapping screw

Art. no.	Pack size
SBKBSS	50 pcs./pack

Fixing angle (nailing angle four-sided)

Art. no.
SBKNW

Pre-assembled Box-out shutters

Pre-assembled Box-out shutter with bracing

Instead of bracing on site, we can supply the pre-assembled box-out shutter complete with bracing.

Price on application.

Joint category “indented” – the shutter profile fulfils the requirement for the highest category “indented” according to DIN 1045-1 and/or DIN EN 1992-1-1.

L-shaped box-out

Box-out shutter height cm		150	160	170	180	190	200	210	220	230	240	250
a x b cm	Wound-off length cm											
70/70	280											
75/75	300											
80/80	320											
85/85	340											
90/90	360											
95/95	380											
100/100	400											
110/110	440											
120/120	480											
130/130	520											
140/140	560											
150/150	600											
160/160	640											
170/170	680											
180/180	720											

Calculate prices for intermediate heights.
These box-out shutters must in general be stiffened at site.

Box-out shutter L-angle, article number KSLWINKEL

Advantages of L-shaped box-out:

- Very large sizes are possible
- Items are supplied to site as two separate L-angles
- Quick and easy assembly without additional fixings
- No freight and storage problems

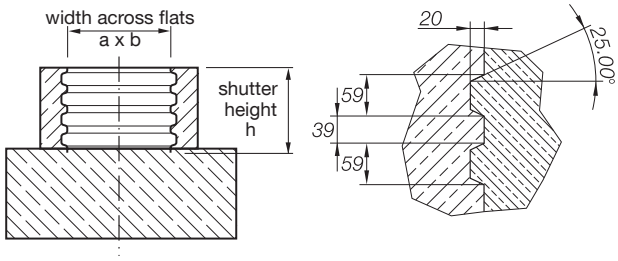
Stiffening chart

Values given in the chart are approximate values only and depend on the actual at-site conditions and on the concreting speed

Box-out shutter width cm	Box-out shutter height cm																	
	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
45/45												■	■	■	■	■	■
50/50											■	■	■	■	■	■	■
55/55										■	■	■	■	■	■	■	■
60/60									■	■	■	■	■	■	■	■	■
65/65								■	■	■	■	■	■	■	■	■	■
70/70							■	■	■	■	■	■	■	■	■	■	■
75/75						■	■	■	■	■	■	■	■	■	■	■	■
80/80					■	■	■	■	■	■	■	■	■	■	■	■	■
85/85				■	■	■	■	■	■	■	■	■	■	■	■	■	■
90/90			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
95/95		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
100/100	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Box-out shutter self-supporting Stiffen box-out shutter at site

All measures are internal dimensions
(when ordering always indicate internal dimensions).
Assume a section depth of 20 mm when designing reinforcement.
Manufacturing tolerances: ± 20 mm
Shutter heights can be selected in increments of 50 mm.
Any rectangular shapes is available; prices depend on size.
Stable trapezoidal section – there is usually no need for bracing.



Joint category "indented" – the shutter profile fulfils the requirement for the highest category "indented" according to DIN 1045-1 and/or DIN EN 1992-1-1.

Trennfit concrete release agents

Trennfit concrete release agents are suitable for all types of formwork (plywood, coated plywood, plastic and steel).

- Outstanding release action
- Adhesion between concrete and the formwork is reduced by up to 95% (for steel forms)
- Plaster bonding capability unaffected
- Reduced labour costs for formwork preparation and cleaning
- Increased service-life of the formwork
- No residues left on the concrete surface
- Concrete hardness unafffected
- No flouring of the concrete surface

Safe and environmentally friendly

- Frost resistant
- Not subject to labelling under hazardous materials Ordinances and EU-guidelines
- Not dangerous goods according to UN, IMO, ADR/RID and IATA/ICAO
- Water hazard class 1, i.e. slightly hazardous to water
- Flash point PM > 100 °C
- Giscode: BTM10
- Trennfit B2 is biologically degradable
- Disposal code:

Trennfit concrete release agents	130205
Trennfit B2 concrete release agent:	130207
empty steel containers:	150104

Steel drums can be completely emptied

Drums containing Trennfit release agent can, if placed horizontally, be completely emptied.
With conventional drums the last 1800 ml cannot be removed.

Coverage per litre of Trennfit release agent when using special sprayer:

Shuttering type	Trennfit B2	Trennfit Super	Trennfit
Steel forms	60 – 70 m^2	80 – 100 m^2	60 – 70 m^2
Concrete form smoothened	5 – 15 m^2	10 – 20 m^2	5 – 15 m^2
Planed wood	25 – 35 m^2	30 – 40 m^2	25 – 35 m^2
Coated formwork panels	50 – 60 m^2	70 – 90 m^2	50 – 60 m^2
Rough wood	15 – 25 m^2	20 – 30 m^2	15 – 25 m^2

Trennfit B2

The biologically degradable release agent

Art. no.	Designation
TBK030	30 litre – steel can
TBF200	200 litre – steel drum

- Biologically degradable
- Good plaster bonding combined with optimum stripping properties
- No discolouration of the concrete
- Workability at temperatures as low as -12 °C
- Patent protected.

Application:

- All concrete constructions
- Suitable for exposed concrete
- For when the concrete is subsequently coated
- Suitable for use in groundwater preservation areas
- Less suitable for steel formwork

Trennfit Super

The mechanical-chemical release agent for highest demands

Art. no.	Designation
TSK030	30 litre – steel can
TSF200	200 litre – steel drum

- No mottling
- Very good plaster bonding
- Workability at temperatures of down to -15 °C
- Outstanding rust-protection properties - prolongs equipment life

Application:

- All concrete constructions
- For architectural and white concrete
- For when the concrete is subsequently coated
- For subsequent plaster and stucco works
- For precasting using either heated or unheated formwork
- Helps conserve steel formwork and construction equipment

Trennfit

The cost-effective release agent for all conventional types of concrete

Art. no.	Designation
TNK030	30 litre – steel can
TNF200	200 litre – steel drum

- Good release action
- Cost-effective
- Easy stripping
- Good plaster bonding

Application:

- Recommended for general concrete construction except for exposed and white concrete

Special sprayer

Designation	Art. no.
Special sprayer made of high-grade steel, 5 litres capacity, incl. spraying hose 1.15 m, spraying tube 0.5 m	TSPRUEH

- Specially developed and manufactured for the application of concrete release agents
- Special nozzle to give a very fine spray
- More than double the spray coverage compared to normal spraying devices
- Made from corrosion- and chemical resistant material to ensure long life
- All spares are stock items for quick delivery
- Release agent can be applied with the special sprayer 3-4 times faster than with any other method

Accessories for Trennfit drums

Designation	Art. no.
Special pump adapted to the 200 litre Trennfit drum	TPUMPE
Drum cradle and spill tray, TÜV-tested, Tray > 200 litres	TAWANNE
Drain cock for Trennfit drums	TFHAEN

- The special pump ensures precision on the construction site
- The Overflow tray prevents soil and ground water contamination and simplifies filling the sprayer with release agent.

Special filler

Art. no.	Colour	Weight kg/pce.	Packaging pieces/carton
TSPACHG	grey	1.00	12
TSPACHC	caramel	1.00	12

Application:

- For filling of crevices and cracks on shutter boards and panels
- For giving a smooth finish to concrete surfaces
- For plugging prior to injection
- For use as a glue for concrete, stone, boards etc.

Preservation of machinery and formwork

Designation	Art. no.	Pack size
Trennfit Deactivator for conservation of machinery, tools and steel formwork	TAF030	30 Ltr.

Threaded steel bar accessories

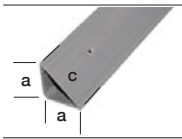
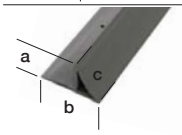
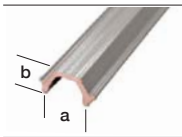
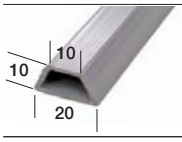
	Designation	Art. no.	Weight	Pack size	Recommended Load-bearing capacity for calculation purposes kN
	Anchor rod Ø 15 mm, St 900/1100 Ø 15 mm, Lengths according to specifications, up to max. 6 m cut deliverable, ends bevelled	GEW15SONL	1.40 kg/m	–	90
	Tie bar Ø 15 mm, type B, weldable and bendable steel, incl. thread over the complete circumference, cut to length according to customer's request, up to max. 6 m, ends bevelled	GEWB15SONL	1.50 kg/m	–	90
	Water stop, 120 x 120 x 2 mm, welded onto tie bar type B	GEWWSB15	0.22 kg/pce.	–	–
	Tie plate beaded and galvanised, size 120 x 120 x 10 mm	GEWAP10	1.10 kg/pce.	20 pce./bundle	90
	Two-wing nut, galvanised, for anchor rod Ø 15 mm	GEWFMUT	0.30 kg/pce.	50 pce./bag	90
	Disc nut galvanised for anchor rod Ø 15 mm, dimension Ø 70 mm, dimension Ø 110 mm	GEWTMZ070 GEWTMZ110	0.46 kg/pce. 0.64 kg/pce.	50 pce./bag 50 pce./bag	90 90
	Welding-compatible hexagon nut for anchor rod Ø 15 mm, dimensions SW 30 mm, length 30 mm, dimensions SW 30 mm, length 50 mm	GEWSKM30 GEWSKM50	0.13 kg/pce. 0.22 kg/pce.	50 pce./bag 50 pce./bag	50 90
	Connecting sleeve, suitable for welding, hexagonal with stop pin for anchor rod Ø 15 mm, dimension SW 30 mm, length 100 mm	GEWVMUF	0.46 kg/pce.	50 pce./bag	90
	Welding flange for anchor rod Ø 15 mm, dimensions 130 x 30 x 50 mm	GEWAFL	0.38 kg/pce.	50 pce./bag	90
	Steel plate water stop for combined shutter tie, interference fitted to steel tube Ø 22 mm and sealed with special glue, size: 120 x 120 mm	MWSS22	0.23 kg/pce.	–	–
	Cast-iron water barrier for anchor rod Ø 15 mm, dimension length 110 mm, Ø 65 mm	MWSG22	0.62 kg/pce.	50 pce./bag	90
	FRANK coupler (plastic) for cast-iron water stop	MKUW22	0.01 kg/pce.	250 pce./bag	–
	Steel/plastic cone for anchor rod Ø 15 mm, total length 100 mm, fitting length 50 mm	GEWSKO15	0.45 kg/pce.	50 pce./bag	90
	Fibre reinforced concrete cone, flush, suitable for steel/plastic cone (GEWSKO15)	FBVKSKK	0.19 kg/pce.	100 pce./carton	–

Threaded steel bar accessories

	Designation	Art. no.	Weight	Pack size	Recommended Load-bearing capacity for calculation purposes kN
	Pigtail anchor – anchor rod Ø 15 mm – type B, length 550 mm	GEWWANK	0.85 kg/pce.	–	90
	Loop anchor – anchor rod Ø 15 mm, type B, dimensions length 550 mm	GEWSANK	1.96 kg/pce.	–	90
	Rock anchor (expansion plug) for anchor rod Ø 15 mm, drill hole 35 – 37 mm	GEWFANK	0.36 kg/pce.	50 pce./carton	–
	Fixing anchor for anchor rod Ø 15 mm, plate dimensions 100 x 70 mm, depth of imbedding in concrete 95 mm	GEWFIXA	0.45 kg/pce.	50 pce./bag	–
	Plastic foot for anchor with sealing stopper and nail for fixing	GEWFIXAK	0.10 kg/pce.	50 pce./bag	–
	Fixing anchor glued to fibre-concrete distance sleeve, incl. nail plug	GEWFIXAB	0.63 kg/pce.	40 pce./carton	–
	Nail plug Ø 27 mm for fixing anchor, with fibre-concrete spacer sleeve	GEWFIXANS	0.01 kg/pce.	500 pce./bag	–
	Plastic sealing stopper Ø 27 mm for fixing anchor with fibre-concrete distance sleeve	GEWFIXAV	0.01 kg/pce.	500 pce./bag	–
	DW 15 key for unscrewing of jammed anchor rods Ø 15 mm	GEWSCHL	1.12 kg/pce.	–	–
	Formwork sleeve red incl. nail plug for anchor rod Ø 15 mm, depth of imbedding in concrete 70 mm	GEWASH	0.06 kg/pce.	100 pce./bag	16 for C20/25
	Formwork sleeve D-15, grey (fibre-glass reinforced), incl. nail plug for anchor rod Ø 15 mm, depth of imbedding 105 mm	GEWASHVB	0.04 kg/pce.	100 pce./bag	23 for C20/25
	Sealing plug for formwork sleeve red and grey	GEWASHVST	0.02 kg/pce.	100 pce./bag	–

More information about lost formwork, recesses and formwork accessories can be found in our brochure at www.maxfrank.com

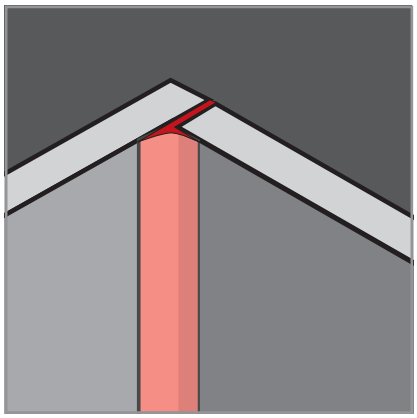
Plastic profiles

	Designation	Art. no.	Dimensions mm	Length m	Pcs./bundle	Lin. m/ pallet	Weight kg/100 m
	Dreika – triangular profile, size a x c	KDR10	10 x 14	2.5	40	10000	6.0
		KDR15	15 x 21	2.5	40	10000	7.0
		KDR20	20 x 28	2.5	40	10000	10.0
		KDR25	25 x 35	2.5	40	4900	14.0
		KDR30	30 x 42	2.5	40	4900	24.0
	Dreikafa – triangular profile with flange, size a x b x c	KDF10	10 x 24 x 14	2.5	40	10000	8.0
		KDF15	15 x 30 x 21	2.5	40	9900	10.0
		KDF20	20 x 38 x 28	2.5	40	4900	15.0
	Wana – weather drip profile, size a x b	KWANA15	A 15 15 x 8	2.5	40	5000	5.6
		KWANA20	A 20 20 x 10	2.5	40	5000	5.8
		KWANA30	A 30 30 x 14	2.5	40	2000	15.8
	Trapezoidal profile 10/20	KTP201010	20 x 10	2.5	40	2000	14.0

Round edge

Designation	Art. no.	Dimensions mm	Roll length m	Carton contents piece
Corner rail made of exposed concrete, for slightly rounded corners (r = 4 mm)	KSBLEISTESK	20 x 3.5 x 3.5	20	6

- The FRANK corner rail for exposed concrete produces a slightly rounded edge.
- This geometry corresponds with the accident prevention regulation (UVV) “schools” GUV-VS1.
- The soft rubber ensures additional sealing of the formwork joint
- Self-adhesive for precise and quick assembly



Adhesive joint tape

	Designation	Art. no.
	Adhesive joint tape Special PVC adhesive tape with outstanding bonding properties (pressure sensitive adhesive) for the sealing of formwork joints, etc., also suitable for pre-oiled, clean surfaces. Roll length: 33 m, roll width: 50 mm, tape thickness: 0.15 mm, can be stretched over 100%, colour: yellow, packaging: 18 rolls/box	FKBANDG
	Foamed plastic joint tape for application in areas where adhesive joint tape cannot be used because of access. Roll length: 10 m, tape thickness: 6 mm, roll width: 19 mm, packaging: 15 rolls/box	FKBANDS

REINFORCEMENT TECHNOLOGIES

FRANK offers an extensive range of reinforcement connection systems for use in construction and expansion joints. Products include a versatile rebar connection system, dowels to take static and dynamic loads and a full range of insulated balcony connectors.

- Stabox® rebar connection system
- Coupler threaded steel coupler system
- Egcodorn dowel systems
- Egcobox® cantilever connection system

Stabox® rebar connection system

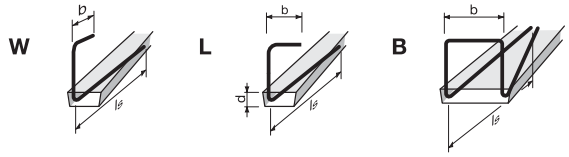
Prefabricated rebar connection systems are a must for modern reinforced concrete construction. Stabox® rebar connection system defines the current state of the art.

The market proven combination of a micro-profiled sheet steel with a dovetail profile or trapezoidal box shape and roughened surface ensures a strong anchorage in the concrete. Due to the optimum geometrical shape of the profile Stabox® satisfies the highest requirements for transverse and longitudinal force transmission in the joint. Further benefits include:

- Steel insert: B500B according to DIN 488, guaranteeing rebendability
- Designed and dimensioned according to DIN 1045-1 and/or DIN EN 1992-1-1 and DBV fact sheet “Bending back concrete steel...”
- Load bearing and force calculations are available for all systems
- Highest category “indented” according to DIN 1045-1 and/or DIN EN 1992-1-1 for transverse force transmission and Stabox® T for shear force transmission

Dimensions of standard types

Standard stirrup versions



Possible hook/ stirrup spacing s cm	Number of stirrups and hooks for standard element length
10	12
15	8
20	6

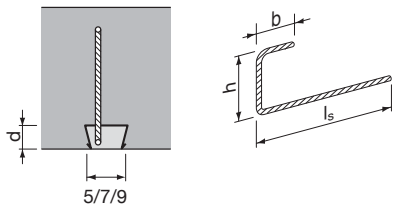
Standard dimensions

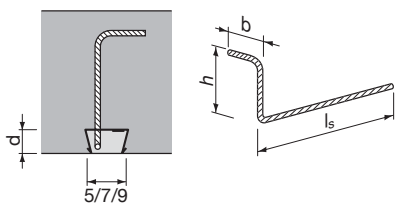
Steel-Ø mm	Possible hook/ stirrup shaping	Possible hook/ stirrup spacing s cm	Stirrup height h cm	Hook length b cm	Lap length l_s cm	Element length l m
8	W / L / B	10 / 15 / 20	17	6.4	30	1.25
10	W / L / B	10 / 15 / 20	17	8.0	38	1.25
12	W / L / B	10 / 15 / 20	17	9.6	46	1.25

Lap length l_s: according to DIN 1045-1 and/or DIN EN 1992-1-1, unless otherwise noted. Bracket width b = box width - 20 mm

Stabox®

Standard single-row versions



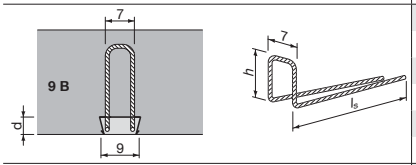
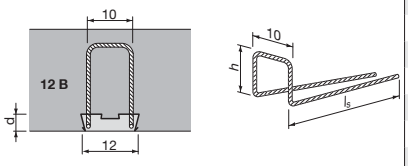
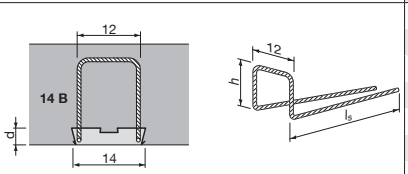
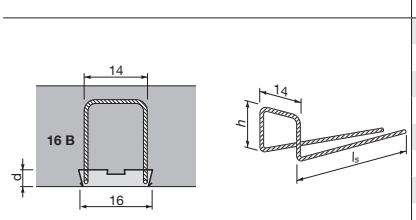
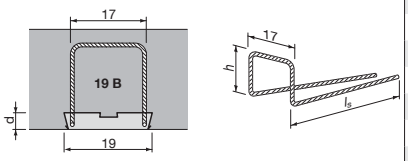
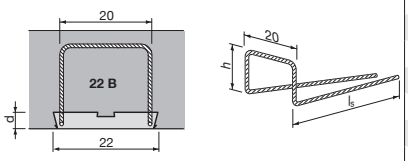
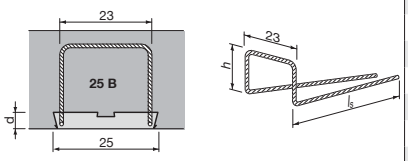


Art. no.	For wall thickness from cm	Type	Steel Ø mm	Stirrup spacing cm	Element length m	Pieces/ pallet	Weight kg/pce.	Weight kg/pallet
STA05W0810	9	5 W	8	10	1.25	120	3.75	470
STA05W0815	9	5 W	8	15	1.25	120	2.88	365
STA05W0820	9	5 W	8	20	1.25	120	2.43	312
STA09W1010	13	9 W	10	10	1.25	120	5.64	697
STA05W1015	9	5 W	10	15	1.25	120	4.31	537
STA05W1020	9	5 W	10	20	1.25	120	3.51	441
STA09W1210	13	9 W	12	10	1.25	120	8.25	1010
STA07W1215	11	7 W	12	15	1.25	120	5.81	718
STA05W1220	9	5 W	12	20	1.25	120	4.40	548
STA05L0810	9	5 L	8	10	1.25	120	3.75	470
STA05L0815	9	5 L	8	15	1.25	120	2.88	365
STA05L0820	9	5 L	8	20	1.25	120	2.43	312
STA09L1010	13	9 L	10	10	1.25	120	5.64	697
STA05L1015	9	5 L	10	15	1.25	120	4.31	537
STA05L1020	9	5 L	10	20	1.25	120	3.51	441
STA09L1210	13	9 L	12	10	1.25	120	8.25	1010
STA07L1215	11	7 L	12	15	1.25	120	5.81	718
STA05L1220	9	5 L	12	20	1.25	120	4.40	548

Please refer to the table “Dimensions of the standard designs”.
Depending on the steel Ø and the clearance, the element thickness “d” is between 30 and 50 mm.
Contingent upon production and installation, there may be deviations of 10 to 20 mm regarding the binder height.
The protective box length without polystyrene end caps is 1.20 m. Standard short elements and connections for precast elements upon request.

Stabox® S

Standard twin-row types, steel case profile “interlocked” where transverse force bearing resistance V_{Rd} is calculationed

	Art. no.	For wall thickness from cm	Type	Steel Ø mm	Stirrup spacing cm	Element length m	Pieces/ pallet	Weight kg/pce.	Weight kg/pallet
	STA09B0815	13	9 B	8	15	1.25	120	4.68	581
	STA09B0820	13	9 B	8	20	1.25	120	3.93	491
	STA09B1015	13	9 B	10	15	1.25	120	6.78	834
	STA09B1020	13	9 B	10	20	1.25	120	5.72	706
	STA12B0810	16-18	12 B	8	10	1.25	120	6.67	820
	STA12B0815	16-18	12 B	8	15	1.25	120	5.12	634
	STA12B0820	16-18	12 B	8	20	1.25	120	4.35	542
	STA12B1015	16-18	12 B	10	15	1.25	120	7.18	882
	STA12B1020	16-18	12 B	10	20	1.25	120	5.80	716
	STA12B1215	16-18	12 B	12	15	1.25	120	10.89	1327
	STA12B1220	16-18	12 B	12	20	1.25	120	8.58	1050
	STA14B0810	18-20	14 B	8	10	1.25	120	6.73	828
	STA14B0815	18-20	14 B	8	15	1.25	120	5.16	639
	STA14B0820	18-20	14 B	8	20	1.25	120	4.37	544
	STA14B1015	18-20	14 B	10	15	1.25	120	7.70	944
	STA14B1020	18-20	14 B	10	20	1.25	120	6.27	773
	STA14B1215	18-20	14 B	12	15	1.25	120	11.55	1406
	STA14B1220	18-20	14 B	12	20	1.25	120	7.08	870
	STA16B0810	20-23	16 B	8	10	1.25	120	6.89	847
	STA16B0815	20-23	16 B	8	15	1.25	120	5.28	654
	STA16B0820	20-23	16 B	8	20	1.25	120	4.47	556
	STA16B1010	20-23	16 B	10	10	1.25	120	10.64	1297
	STA16B1015	20-23	16 B	10	15	1.25	120	7.78	954
	STA16B1020	20-23	16 B	10	20	1.25	120	6.35	782
	STA16B1210	20-23	16 B	12	10	1.25	120	13.60	1652
	STA16B1215	20-23	16 B	12	15	1.25	120	11.57	1408
	STA16B1220	20-23	16 B	12	20	1.25	120	9.19	1123
	STA19B0810	23-26	19 B	8	10	1.25	60	7.00	440
	STA19B0815	23-26	19 B	8	15	1.25	60	5.34	340
	STA19B0820	23-26	19 B	8	20	1.25	60	4.51	291
	STA19B1010	23-26	19 B	10	10	1.25	60	10.82	669
	STA19B1015	23-26	19 B	10	15	1.25	60	7.89	493
	STA19B1020	23-26	19 B	10	20	1.25	60	6.42	405
	STA19B1210	23-26	19 B	12	10	1.25	60	17.48	1069
	STA19B1215	23-26	19 B	12	15	1.25	60	12.52	771
	STA19B1220	23-26	19 B	12	20	1.25	60	10.09	625
	STA22B0810	26-29	22 B	8	10	1.25	60	7.91	495
	STA22B0815	26-29	22 B	8	15	1.25	60	6.21	393
	STA22B0820	26-29	22 B	8	20	1.25	60	5.36	341
	STA22B1010	26-29	22 B	10	10	1.25	60	12.03	742
	STA22B1015	26-29	22 B	10	15	1.25	60	8.89	553
	STA22B1020	26-29	22 B	10	20	1.25	60	7.37	462
	STA22B1210	26-29	22 B	12	10	1.25	60	18.02	1101
	STA22B1215	26-29	22 B	12	15	1.25	60	12.95	797
	STA22B1220	26-29	22 B	12	20	1.25	60	10.41	645
	STA25B0810	29	25 B	8	10	1.25	60	8.33	520
	STA25B0815	29	25 B	8	15	1.25	60	6.58	415
	STA25B0820	29	25 B	8	20	1.25	60	5.71	362
	STA25B1010	29	25 B	10	10	1.25	60	12.54	772
	STA25B1015	29	25 B	10	15	1.25	60	9.32	579
	STA25B1020	29	25 B	10	20	1.25	60	7.76	486
	STA25B1210	29	25 B	12	10	1.25	60	18.72	1143
	STA25B1215	29	25 B	12	15	1.25	60	13.54	832
	STA25B1220	29	25 B	12	20	1.25	60	10.85	671

Please refer to table “Dimensions of standard designs”.
Depending on the steel diameter and clearance, the element thickness varies between 30 mm and 50 mm.
The bracket height may vary by 10 to 20 mm because of manufacturing and installation tolerances.
The storage box length without polystyrene end caps is 1.20 m.

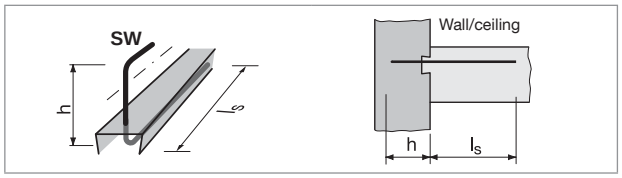
Rebending tools

Art. no.	For steel diameter mm	Identification colour
STARBW08	8	yellow
STARBW10	10	green
STARBW12	12	red

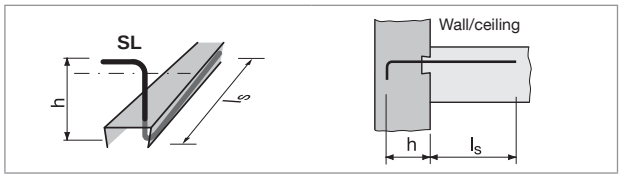
Please ensure that only suitable tools are used for rebending.

Special Stabox® designs can be produced within short notice to your specifications. Kindly get in contact with our technical advisory service or use our order forms – available for free-of-charge download under www.maxfrank.com.

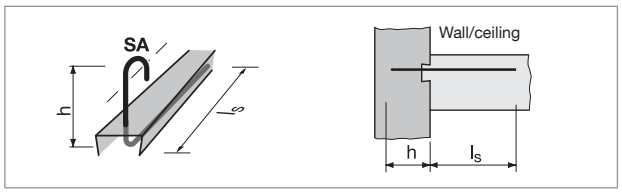
Type SW
Article number STASW



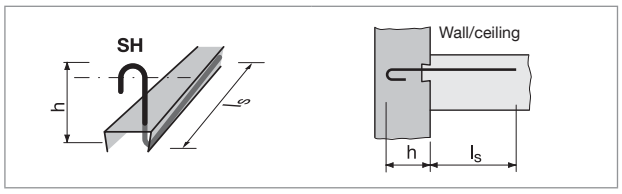
Type SL
Article number STASL



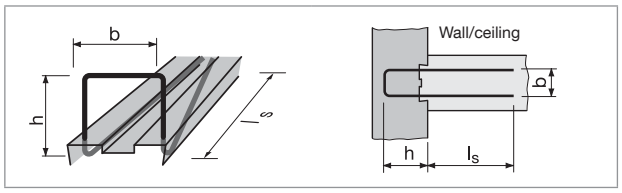
Type SA
Article number STASA



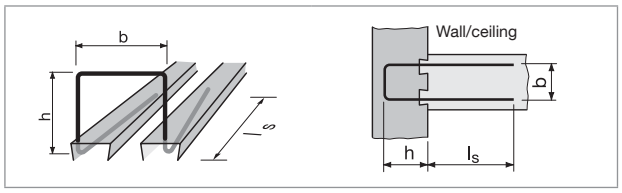
Type SH
Article number STASH



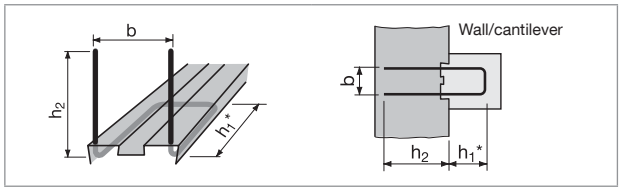
Type SB
Article number STASB



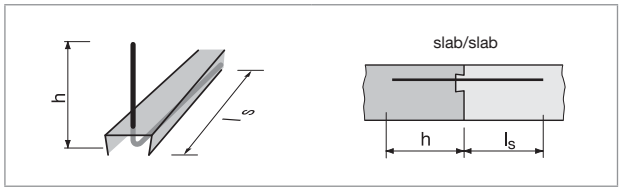
Type SD
often used in connection with injection hose (water stop)
Article number STASD



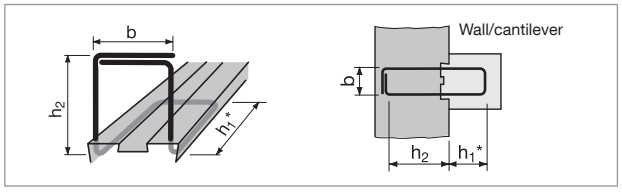
Type SU for consoles
Article number STASU



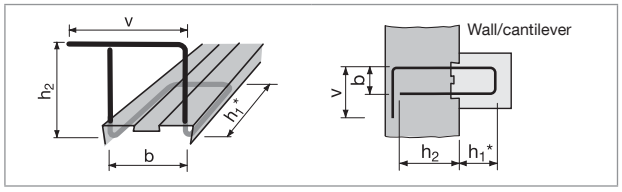
Type SG with lap joint on both sides
Article number STASG



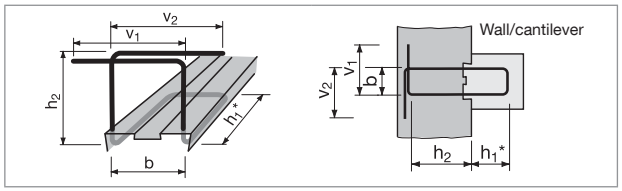
Type SK for consoles
Article number STASK



Type SK1 for consoles
Article number STASK1



Type SK2 for consoles
Article number STASK2

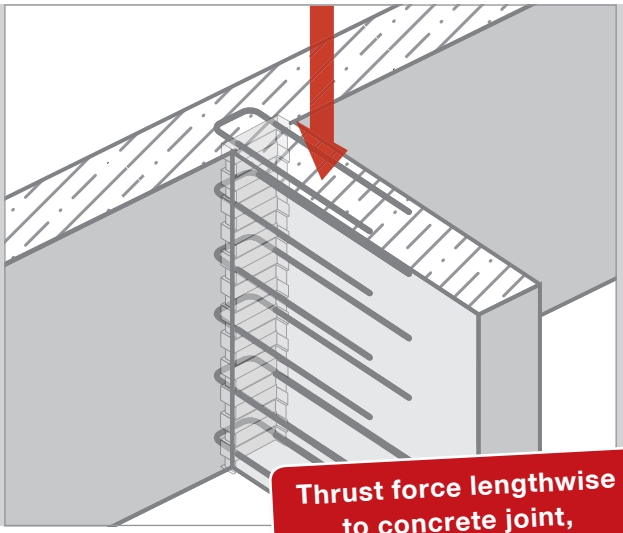


** Due to reasons of production and installation, h_1 may vary by 10 to 20 mm for cantilever Stabox® types.*

Stabox® T special rebar connection system for high shearing forces

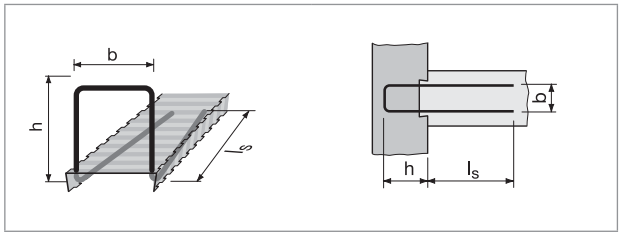
As a result of the further development of the Stabox® S, Stabox® T was developed especially for construction joints exposed to shearing forces parallel to the construction joint. The special very solid trapezoidal sheet steel plate of the Stabox® T fulfils maximum requirements according to DIN 1045-1 and/or DIN EN 1992-1-1 “indented” parallel to joint direction.

Prices and design versions on request.



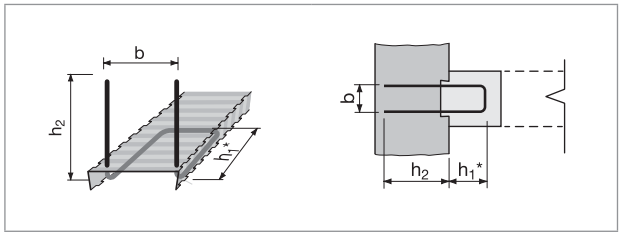
Type TB

Article number STATB



Type TU for consoles

Article number STATU



** Due to reasons of production and installation, h_1 may vary by 10 to 20 mm for cantilever Stabox® types.*

Stabox® T

Type	For wall thickness from cm	Steel diameter mm	Stirrup spacing cm	Stirrup width b cm	Element length m	Pieces/pallet	Weight kg/pce.	Weight kg/pallet
STATB12B	16-18	8	15	10	1.25	60	5.54	352
STATB12B	16-18	8	20	10	1.25	60	4.77	306
STATB12B	16-18	10	15	10	1.25	60	7.60	476
STATB12B	16-18	10	20	10	1.25	60	6.22	393
STATB16B	20-23	8	10	14	1.25	60	7.48	469
STATB16B	20-23	8	15	14	1.25	60	5.87	372
STATB16B	20-23	8	20	14	1.25	60	5.06	324
STATB16B	20-23	10	15	14	1.25	60	8.37	522
STATB16B	20-23	10	20	14	1.25	60	6.94	436
STATB16B	20-23	12	15	14	1.25	60	12.16	750
STATB16B	20-23	12	20	14	1.25	60	9.78	607
STATB19B	23-26	8	10	17	1.25	60	7.76	486
STATB19B	23-26	8	15	17	1.25	60	6.01	381
STATB19B	23-26	8	20	17	1.25	60	5.18	331
STATB19B	23-26	10	10	17	1.25	60	11.49	709
STATB19B	23-26	10	15	17	1.25	60	8.56	534
STATB19B	23-26	10	20	17	1.25	60	7.09	445
STATB19B	23-26	12	15	17	1.25	60	13.19	811
STATB19B	23-26	12	20	17	1.25	60	10.76	666
STATB22B	26-29	8	10	20	1.25	60	8.67	540
STATB22B	26-29	8	15	20	1.25	60	6.97	438
STATB22B	26-29	8	20	20	1.25	60	6.12	387
STATB22B	26-29	10	10	20	1.25	60	12.79	787
STATB22B	26-29	10	15	20	1.25	60	9.65	599
STATB22B	26-29	10	20	20	1.25	60	8.13	508
STATB22B	26-29	12	10	20	1.25	60	18.78	1147
STATB22B	26-29	12	15	20	1.25	60	13.73	844
STATB22B	26-29	12	20	20	1.25	60	11.17	690

Please refer to table “Dimensions of standard designs”.
Depending on the steel diameter and clearance, the element thickness varies between 30 mm and 50 mm.
The bracket height may vary by 10 to 20 mm because of manufacturing and installation tolerances.
The storage box length without polystyrene end caps is 1.20 m.

Stabox® F reinforcement connection for watertight constructions

Minimum formwork disruption – maximum sealing

- Solution for sealing construction joints with end-to-end reinforcement in accordance with construction site standards
- Secure sealing of the joints – confirmed by a general appraisal certificate ABP
- Reduced formwork disruption with no penetrations
- Variable element lengths of up to 3 metres possible

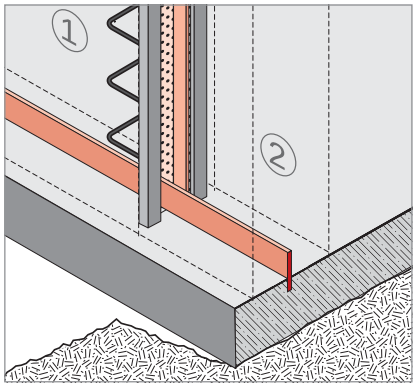
Stabox® F combines the product advantages of reinforcement connection with a coated metal waterstop, Fradiflex

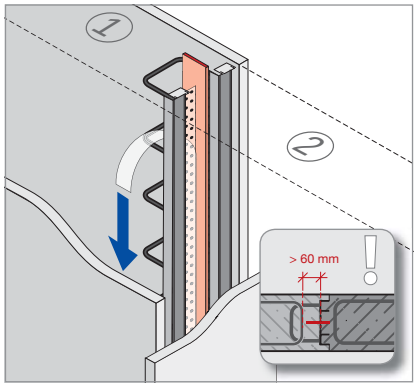
Stabox® F reinforcement connections simplify the formwork activities at construction joints, e.g. a statically loaded and sealed joint solution is possible for front-face wall connections by the combination of Stabox® with a Fradiflex coated metal waterstop. The integrated section of Stremaform® ribbed expanded metal ensures a rough surface for an excellent bond between successive pours.

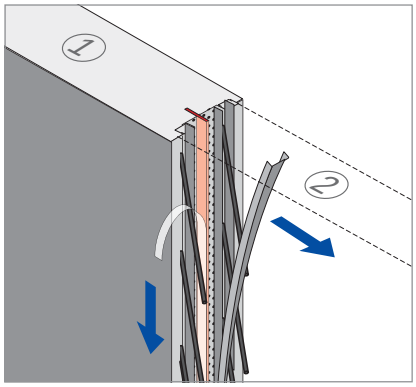
For “T” wall and/or “L” wall connections, the course of the reinforcement must be designed accordingly.
The integrated, coated Fradiflex metal waterstop continues the construction joint sealing floor-wall without any interruptions. A Fradiflex coated metal waterstop can also be used in the load case “Pressing water” up to a constantly applied hydrostatic pressure of 2 bar (20 m head).

Stabox® F

Art. no.	For wall thickness from cm	Steel diameter mm	Stirrup spacing cm	Minimum bracket width cm	Element length cm
STAFD	22	8 / 10 / 12 / 14	10 / 15 / 20	16 (box width 5)	80 – 300
				24 (box width 9)	
				30 (box width 12)	



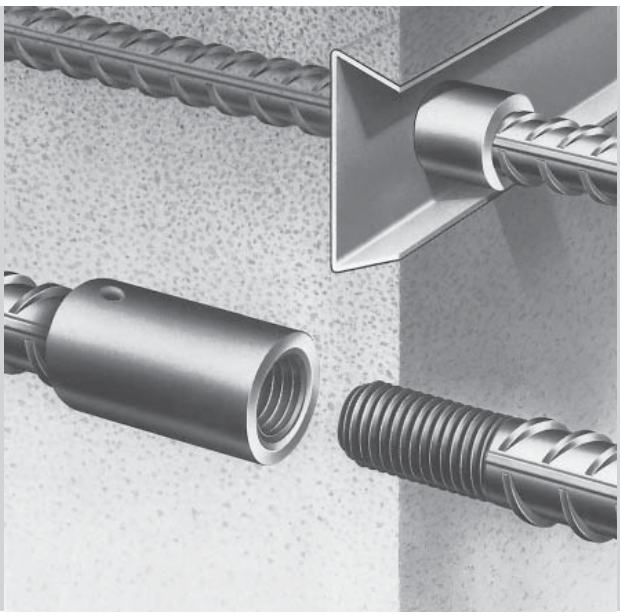




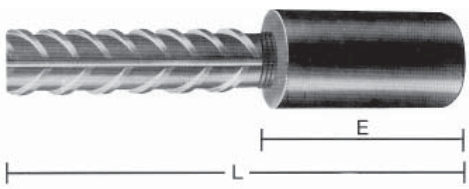
Coupler

The rebar connection system with the 100% load transmission – suitable for both static and dynamic load.

- Coupler – threaded steel coupler system is a natural extension to our rebendable Stabox® rebar connection system for rebars > 12 mm
- Holds a general approval issued by the DIBt (German Institute for Structural Engineering) of Berlin, Germany, Z-1.5-100
- Mild steel B500 according to DIN 488

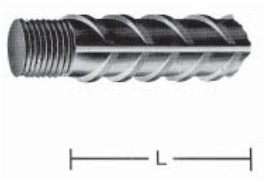


CA-bar + socket incl. thread protection cap



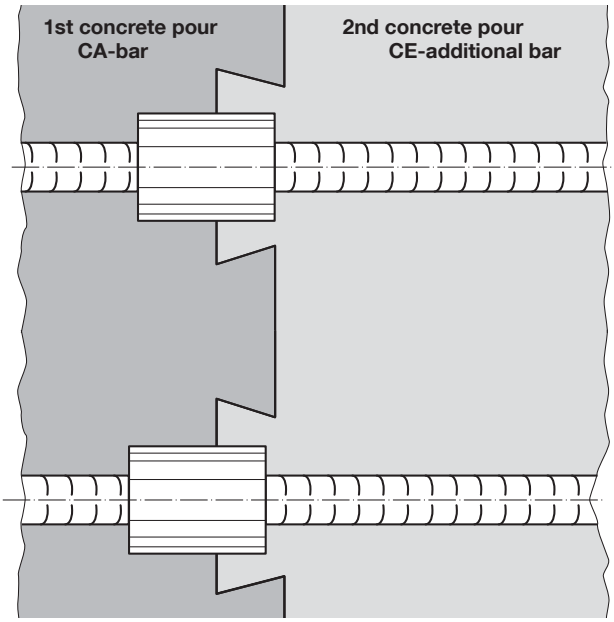
Thread protection cap

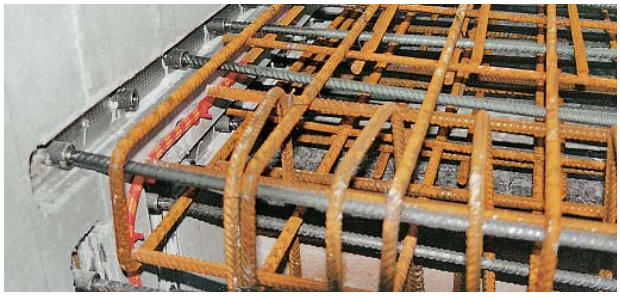
CE-additional bar



1st concrete pour **2nd concrete pour**

- Secure protection of the CA bars by thread protection caps
- The use of both the single box and coupler box ensures precise location of the reinforcement bars, as well as outstanding corrosion protection and additional thrust interlocking
- Simply screw the CE-bars into the box, finally tightening it to the specified torque using a torque wrench
- Leverage of the static benefit of an “indented joint” by observing the geometry according to DIN EN 1992-1-1 and/or DIN 1045-1





CA bar + socket

incl. thread protection cap for the first concrete pour

Art. no.	Diameter mm	Length mm	Sleeve E mm	Weight kg/pce.
CCA120400	12	400	40	0.44
CCA120570	12	570	40	0.56
CCA120800	12	800	40	0.77
CCA121500	12	1500	40	1.39
CCA140660	14	660	45	0.87
CCA140930	14	930	45	1.19
CCA141500	14	1500	45	1.88
CCA161020	16	1020	45	1.81
CCA161440	16	1440	45	2.48
CCA161800	16	1800	45	3.05
CCA201280	20	1280	52	3.36
CCA201800	20	1800	52	4.64
CCA202100	20	2100	52	5.38
CCA251600	25	1600	60	6.53
CCA252260	25	2260	60	9.07
CCA252600	25	2600	60	10.38
CCA281790	28	1790	65	9.15
CCA282530	28	2530	65	12.73
CCA283000	28	3000	65	15.00

CE-additional bar

for the second concrete pour

Art. no.	Diameter mm	Length mm	Weight kg/pce.
CCE120400	12	400	0.36
CCE120570	12	570	0.51
CCE120800	12	800	0.71
CCE121500	12	1500	1.33
CCE140660	14	660	0.80
CCE140930	14	930	1.13
CCE141500	14	1500	1.81
CCE161020	16	1020	1.62
CCE161440	16	1440	2.28
CCE161800	16	1800	2.85
CCE201280	20	1280	3.16
CCE201800	20	1800	4.45
CCE202100	20	2100	5.19
CCE251600	25	1600	6.16
CCE252260	25	2260	8.70
CCE252600	25	2600	10.01
CCE281790	28	1790	8.65
CCE282530	28	2530	12.22
CCE283000	28	3000	14.49

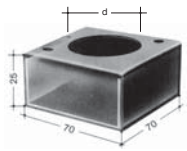
CAE socket and thread bar

for the first and second concrete pour

Art. no.	Diameter mm	Sleeve E mm	Tightening moment Nm	Weight kg/pce.
CCAE120400	12	40	60	0.80
CCAE120570	12	40	60	1.07
CCAE120800	12	40	60	1.48
CCAE121500	12	40	60	2.72
CCAE140660	14	45	100	1.67
CCAE140930	14	45	100	2.32
CCAE141500	14	45	100	3.70
CCAE161020	16	45	100	3.43
CCAE161440	16	45	100	4.76
CCAE161800	16	45	100	5.90
CCAE201280	20	52	200	6.52
CCAE201800	20	52	200	9.09
CCAE202100	20	52	200	10.57
CCAE251600	25	60	250	12.69
CCAE252260	25	60	250	17.77
CCAE252600	25	60	250	20.39
CCAE281790	28	65	280	17.80
CCAE282530	28	65	280	24.95
CCAE283000	28	65	280	29.49

Fixing aids

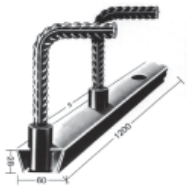
Coupler Single box (with cover)

	Designation	Art. no.	Type	Diameter mm	Weight kg/pce.
	Fix single Coupler box to the formwork with two nails; insert CA rod into the box as far as it will go and attach it to the local reinforcement.	CEBOX12*	Single box Ø 12 + Ø 14	22	0.12
		CEBOX16*	Single box Ø 16 + Ø 20	33	0.12
		CEBOX25	Single box Ø 25	40	0.12
		CEBOX28	Single box Ø 28	45	0.12

* Coupler box for bar Ø 14 corresponds to that of Ø 12, and for bar Ø 20 to that of Ø 16

Fixing aids

Coupler box (with cover)

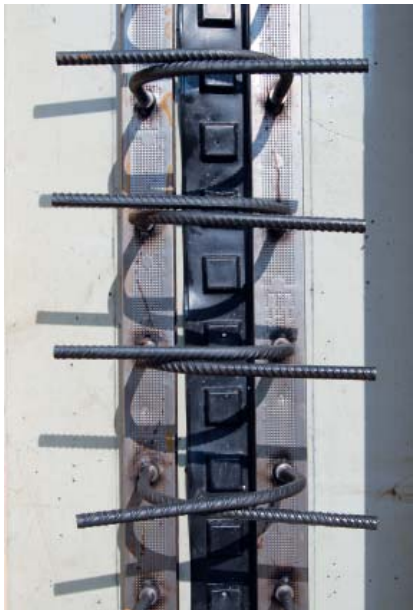
	Designation	Art. no.	Type	Possible connection per 1.2 m element	Distance s cm	Weight kg/pce.
	The single box can be easily extended for longer applications. Bar spacing “s” can be supplied in any dimension. Coupler box with cover and 2 end caps. Other bar spacings “s” can be supplied on request.	CCB1210120*	Couplerbox ø 12	12	10	0.90
		CCB1610120*	Couplerbox ø 16	12	10	0.90
		CCB2510120	Couplerbox ø 25	12	10	0.90
		CCB2810120	Couplerbox ø 28	12	10	0.90
		CCB1215120*	Couplerbox ø 12	8	15	0.90
		CCB1615120*	Couplerbox ø 16	8	15	0.90
		CCB2515120	Couplerbox ø 25	8	15	0.90
		CCB2815120	Couplerbox ø 28	8	15	0.90
		CCB1220120*	Couplerbox ø 12	6	20	0.90
		CCB1620120*	Couplerbox ø 16	6	20	0.90
		CCB2520120	Couplerbox ø 25	6	20	0.90
		CCB2820120	Couplerbox ø 28	6	20	0.90

* Coupler box for bar Ø 14 corresponds to that of Ø 12, and for bar Ø 20 to that of Ø 16

Coupler

Torque wrench for 12 - 28 mm

	Art. no.	Weight kg/pce.
	CLDREH	5.00



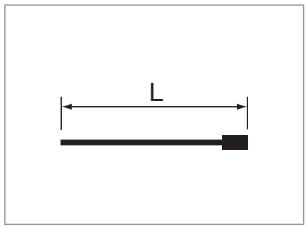
Pre-assembled Coupler reinforcement elements in the 1st CP with additional teething by means of joint profile former

Reinforcement layer in the 1st CP: attachment of the WCA coupling bars to the local reinforcement

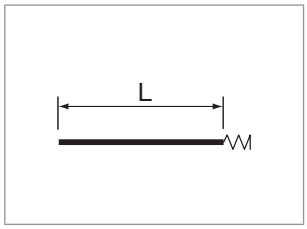
Concreting result: position of the Coupler sleeves within the indented joint

Special Coupler types are manufactured to your requirements.
Please get in contact with our technical advisory service.

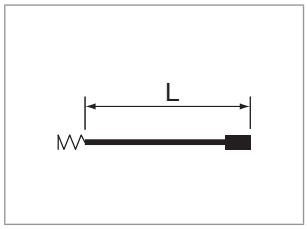
Type CA
Article number CCA12*SONL



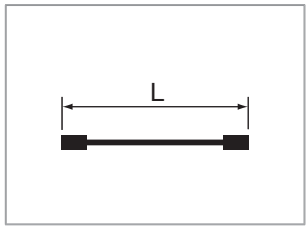
Type CE
Article number CCE12*SONL



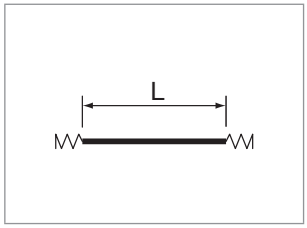
Type ECA
Article number CECA12*



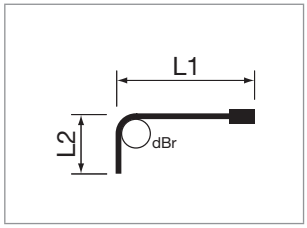
Type DCA
Article number CSDCA



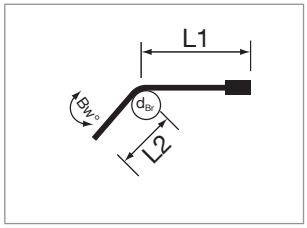
Type DCE
Article number CSDCE



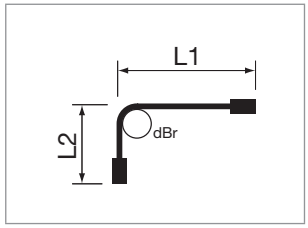
Type WCA
Article number CSWCA



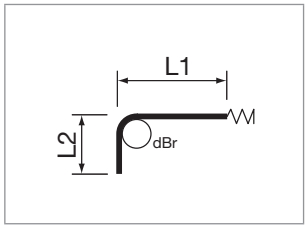
Typ WCASB
Article number CSWCASB



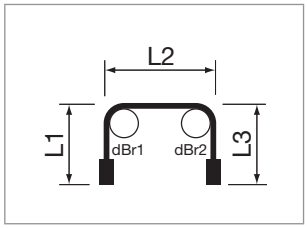
Type DCAW
Article number CSDCAW



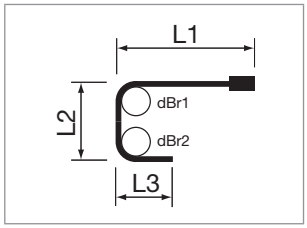
Type WCE
Article number CSWCE



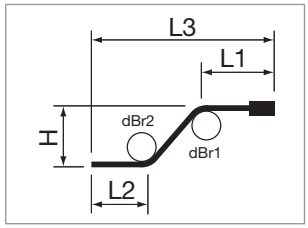
Type DWCA
Article number CSDWCA



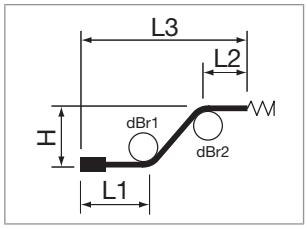
Type WCAG
Article number CSWCAG



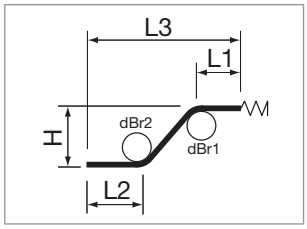
Type WWCA
Article number CSWWCA



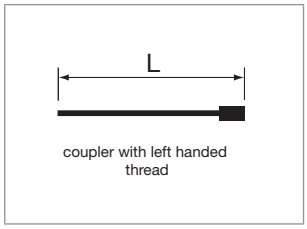
Type WWECA
Article number CSWWECA



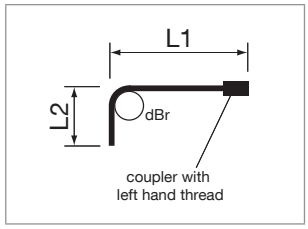
Type WWCE
Article number CSWWCE



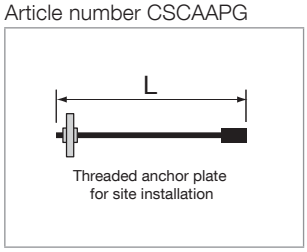
Type CALG
Article number CSCALG



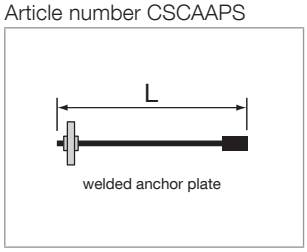
Type WCALG
Article number CSWCALG



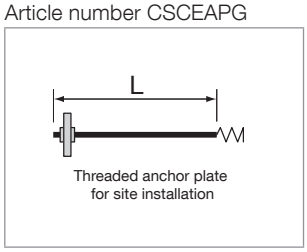
Type CA-APG
Article number CSCAAPG



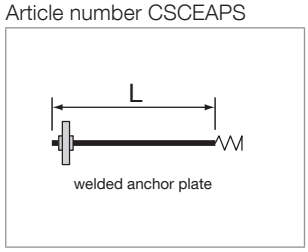
Type CA-APS
Article number CSCAAPS



Type CE-APG
Article number CSCEAPG



Type CE-APS
Article number CSCEAPS



** varying according to bar diameter 12, 14, ...*

- Special types are cost-efficiently manufactured to your requirements. Please enquire for delivery time.
- Certificate of suitability (SLV Munich) for welding of concrete reinforcing steel by flash welding machine, as well as further certificates of suitability (SLV Munich) for concrete steel connections according to DIN EN ISO 17660-1 present.

Please enquire for prices of the special types.

The production of special accessories is carried out using the same quality criteria as for the standard ranges. However, our certification does not cover the production of special accessories. Structural analysis verification must be carried out in each specific application.

Adapter connection

The adapter should be used when rebars with bent legs are required or are unable to be screwed in.

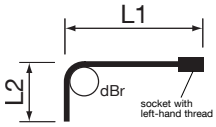
System description

Socket with right-hand/left-hand thread (designation „LG“ for left-hand thread)

Adapter for connecting left-hand threaded socket to standard right-hand threaded socket

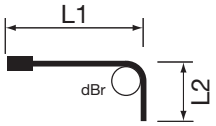
Standard right-hand threaded socket

Application example



For adapter connection in one concrete pour, a socket with right-hand/left-hand thread must be used.

Screwing the adapter brings the rebars together up to the limit stop.
A locknut is used for fixing the assembly.



A standard right-hand threaded socket is fixed to the second rebar.

Product combinations with Coupler threaded steel coupler system

stand for the highest requirements regarding force transmission both for static and dynamic loads.

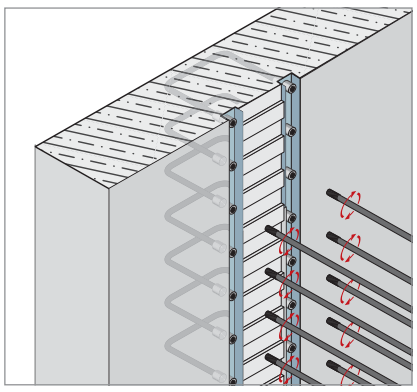
In order to provide for installation friendly handling according to construction site standards, Coupler are inserted into pre-fabricated elements ex factory already.

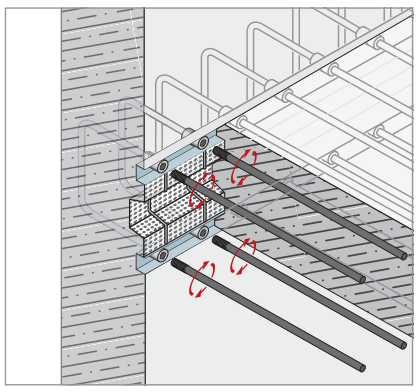
The combination options for our products allow the structural engineer to reliably and securely implement his static requirements regarding the construction joint (joint category and reinforcement) during practical building construction.

The joint elements are pre-fabricated ex factory in an installation friendly manner.

Potential on-site errors, such as incorrect rebar diameters and bar placement or non-observance of the design cover are minimised this way.

Exact reinforcement layer in the 2nd concreting phase due to simple installation of the Coupler connecting rods in the indented joint.



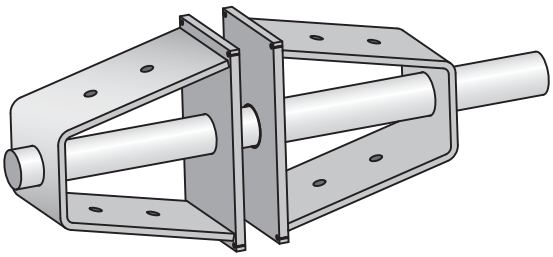


Coupler rebar connection system is used to finish pre-fabricated joint formwork elements for highly stressed components with large steel diameters 12 to 28 mm ex factory.
On the basis of the variation options with the different joint formwork elements such as Stabox® S, Stabox® T, Stremaform®, Stremaboard or joint formwork profile, the elements can be designed both in transverse and in thrust direction as indented joint according to DIN EN 1992-1-1:2011 (NA:2011-01).

Product combinations with Coupler offer many planning and solution options according to construction site standards, please consult our application technology department!

Egcodorn:
the stainless steel dowel system

Egcodorn is a high-performance corrosion-proof transverse shear force dowel which transfers maximum loads whilst having a minimal component thickness. When using Egcodorn, extensive expansion joint formwork is not necessary. Egcodorn's unique corrosion protection system and the use of high-quality materials guarantee the highest safety and reliability.



The Egcodorn stainless steel dowel system has a DIBt (Deutsches Institut für Bautechnik Berlin = German Institute for Structural Engineering Berlin) approval.

Expansion joints allow for controlled movement between adjacent concrete elements caused by physical changes such as thermal expansion, shrinkage and material creep. The primary application of an Egcodorn dowel is to carry loads across an expansion joint in which shear forces may occur.

Joints which are subject to transverse forces can also be catered for, by using the highly sophisticated Egcodorn transverse force dowel. The DIBt approved Egcodorn system offers:

- Optimum load transmission into the concrete
- Transfers maximum loads whilst having a minimum component thickness
- Easy, rapid and cost efficient joint production
- Highest corrosion protection due to use of high quality stainless steel
- Allows for transmission of static and dynamic loads
- Simple installation
- Cost-effective
- Fire protection R120

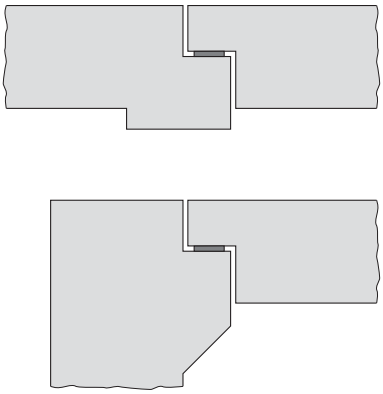
Special designs available upon request:

- Complete formwork elements combining Egcodorn and Stremaform®
- Customised solutions for absorption of dynamic expansion joint loads

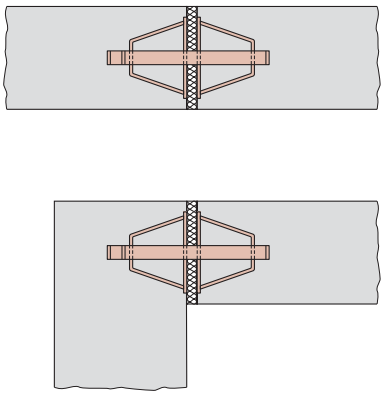
DIBT Zulassung Z-15.7-252 vom 03.07.06 Deutsches Institut für Bautechnik Berlin

DIBT Zulassung Z-15.7-266 vom 30.10.08 Deutsches Institut für Bautechnik Berlin

Examples of use



conventional joint construction

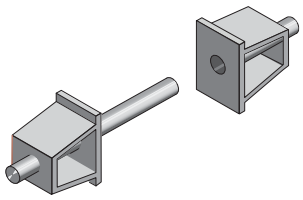
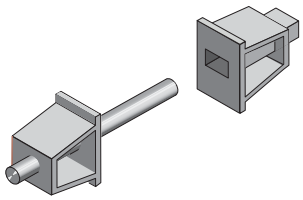


optimum solution using the Egcodorn

Complete formwork element combining Egcodorn and Stremaform® pre-installed and delivered onto site for expansion joint construction

Egcodorn

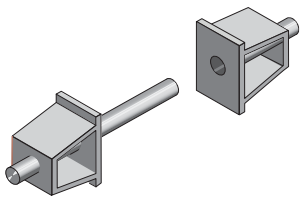
Transverse force dowels for very high static loads with DIBt approval and load values acc. to Eurocode

	Designation	Art. no.	Type	Weight kg/pce.
	Approved for transverse load transmission, allows lengthwise movement	DNB050	DNB50	3.02
		DNB070	DNB70	4.53
		DNB095	DNB95	6.63
		DNB100	DNB100	7.83
		DNB120	DNB120	9.00
		DNB150	DNB150	13.11
		DNB210	DNB210	19.66
		DNB300	DNB300	34.59
		DNB350	DNB350	38.36
	Approved for transverse load transmission, allows lengthwise and lateral movement	DQB050	DQB50	4.27
		DQB070	DQB70	5.47
		DQB095	DQB95	8.62
		DQB100	DQB100	9.98
		DQB120	DQB120	11.21
		DQB150	DQB150	15.06
		DQB210	DQB210	24.19
		DQB300	DQB300	37.89
		DQB350	DQB350	45.59

For special structures, complete formwork systems combining both Egcodorn and Stremaform®, please contact our application technology department. Application-specific instructions, design tables and calculation aids for Egcodorn can be found in our Egcodorn brochure.

Egcodorn

Transverse force dowels for transverse force transmission and dynamic loads with DIBt approval Z-15.7-266

	Designation	Art. no.	Type	Weight kg/pce.
	Approved for both transverse load transmission and for dynamic loads, allows lengthwise movement	DND050	DND50	3.02
		DND070	DND70	4.53
		DND095	DND95	6.63
		DND100	DND100	7.83
		DND120	DND120	9.00
		DND150	DND150	13.48
		DND210	DND210	19.66
		DND300	DND300	34.59
		DND350	DND350	38.36

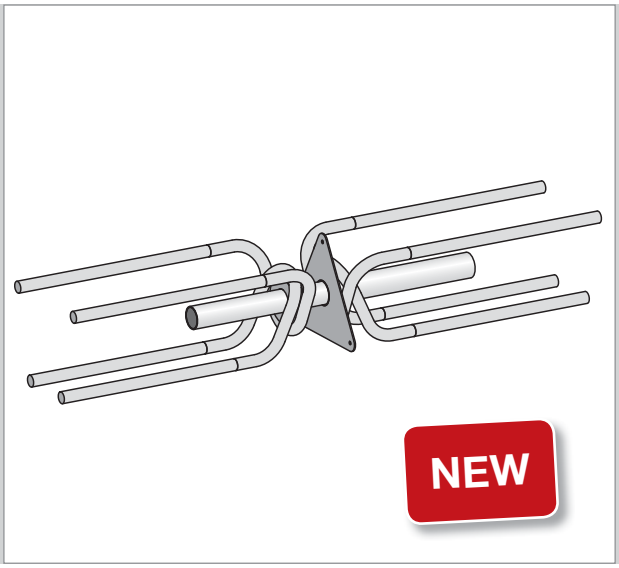
For specific structures, complete formwork systems which combine Egcodorn and Stremaform® as well as for applications requiring additional transmission of dynamic loads within the joint, please get in contact with our application technology department.

For fire protection requirements of up to F120, use our fire protection sleeve on page 88.

Egcodorn transverse force dowel

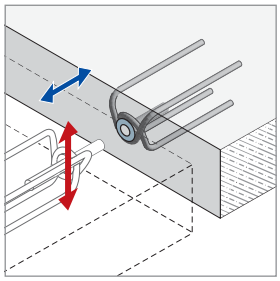
The design of the anchor structure of the dowel provides for a homogeneous flux of the various forces.
The redirection and the rear anchoring of the forces allows for the introduction of high loads with low component dimensions. Due to the open design of the anchor body, Egcodorn can be easily integrated into the in-situ reinforcement to be provided by the customer.

- High loads at low component dimensions
- Individual combination of dowel and anchor body
- Easy installation by means of open structure



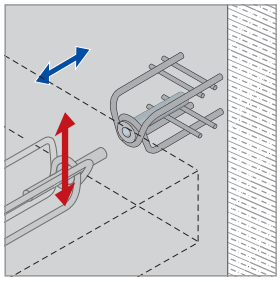
Egcodorn N

The Type N dowel only allows for displacement in the direction of the longitudinal dowel axis. The dowels must be arranged carefully in the displacement direction, as well as being oriented parallel to each other.



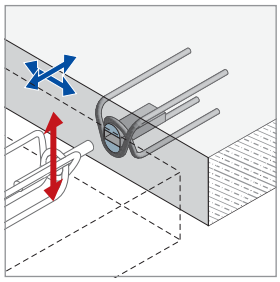
Egcodorn WN

The Type WN dowel only allows for displacement in the direction of the longitudinal dowel axis and with a shorter anchor body is used for installation in wall applications.



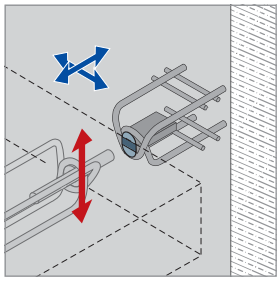
Egcodorn Q

The Type Q dowel allows for displacements both longitudinal and transverse to the dowel axis. In the event of curved sections or long joints a Type Q dowel should be used. The dowels must be arranged carefully in the displacement direction, as well as being oriented parallel to each other.

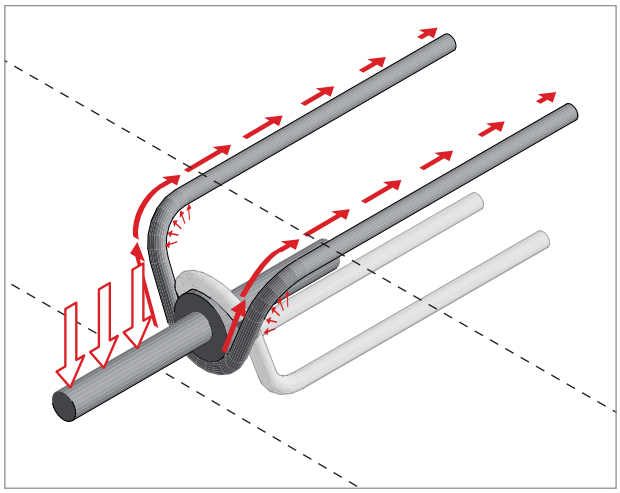


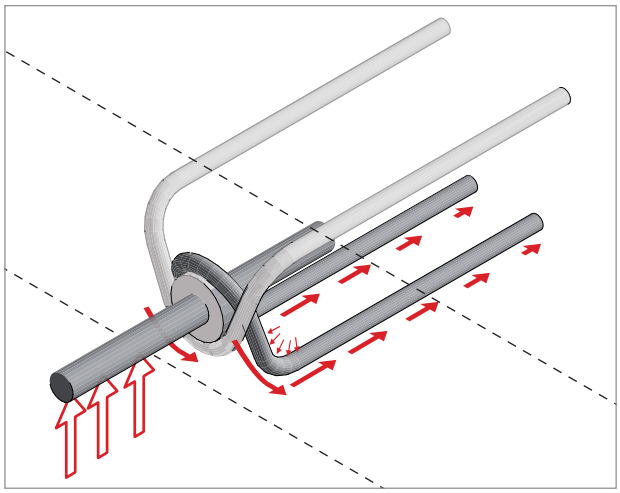
Egcodorn WQ

The Type WQ dowel allows for displacements both longitudinal and transverse to the dowel axis and with a shorter anchor body is used for installation in wall applications.



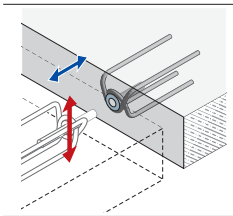
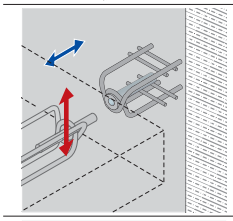
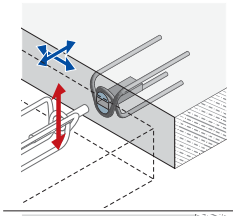
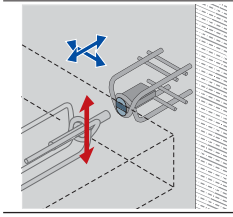
The new Egcodorn with optimised load application into the component





Egcodorn

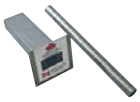
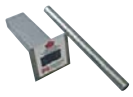
Shear force dowels for very high static loads

	Art. no.	Type	Weight kg/pce.
	EGCODORNN040	N40	2.2
	EGCODORNN050	N50	3.3
	EGCODORNN070	N70	5.0
	EGCODORNN095	N95	7.2
	EGCODORNN100	N100	12.2
	EGCODORNN120	N120	12.7
	EGCODORNN150	N150	13.7
	EGCODORNN210	N210	24.8
	EGCODORNWN040	WN40	2.1
	EGCODORNWN050	WN50	3.2
	EGCODORNWN070	WN70	4.7
	EGCODORNWN095	WN95	6.8
	EGCODORNWN100	WN100	11.4
	EGCODORNWN120	WN120	11.9
	EGCODORNWN150	WN150	12.9
	EGCODORNWN210	WN210	23.3
	EGCODORNQ040	Q40	2.5
	EGCODORNQ050	Q50	3.6
	EGCODORNQ070	Q70	5.2
	EGCODORNQ095	Q95	7.3
	EGCODORNQ100	Q100	12.3
	EGCODORNQ120	Q120	12.9
	EGCODORNQ150	Q150	14.4
	EGCODORNQ210	Q210	25.5
	EGCODORNWQ040	WQ40	2.4
	EGCODORNWQ050	WQ50	3.4
	EGCODORNWQ070	WQ70	4.9
	EGCODORNWQ095	WQ95	6.9
	EGCODORNWQ100	WQ100	11.5
	EGCODORNWQ120	WQ120	12.2
	EGCODORNWQ150	WQ150	13.6
	EGCODORNWQ210	WQ210	24.0

For fire protection requirements of up to F120, use our fire protection sleeve on page 88.

Egcodubel with sleeve

for expansion joints

	Designation	Art. no.	Type	Dowel Ø mm	Length of dowel mm
	Stainless-steel dowel (DM), material: HF, incl. circular stainless steel sliding sleeve (HI), for transmission of lengthwise movement	EDMH20*	DMHI20HF	20	340
		EDMH22*	DMHI22HF	22	350
		EDMH27*	DMHI27HF	27	360
		EDMH30*	DMHI30HF	30	400
		EDMH37*	DMHI37HF	37	470
	Stainless-steel dowel (DM), material: S 355, incl. circular stainless-steel sliding sleeve (HI), for transmission of lengthwise movement	EDMH20*	DMHI20	20	300
		EDMH22*	DMHI22	22	300
		EDMH27*	DMHI27	27	300
		EDMH30*	DMHI30	30	350
	Stainless-steel dowel (DM), material: HF, incl. rectangular stainless-steel sliding sleeve (HQI), for transmission of lengthwise and lateral movement	EDMH20*	DMHQI20HF	20	340
		EDMH22*	DMHQI22HF	22	350
		EDMH27*	DMHQI27HF	27	360
		EDMH30*	DMHQI30HF	30	400
		EDMH37*	DMHQI37HF	37	470
	Stainless-steel dowel (DM), material: S 355, incl. rectangular stainless-steel sliding sleeve for transmission of lengthwise and lateral movement	EDMH20*	DMHQI20	20	300
		EDMH22*	DMHQI22	22	300
		EDMH27*	DMHQI27	27	300
		EDMH30*	DMHQI30	30	350
	Stainless-steel dowel (DM), material: high-strength (HF), incl. circular plastic sliding sleeve (H), for max. dowel length 500 mm and for transmission of lengthwise movement	EDMH20*	DMH20HF	20	340
		EDMH22*	DMH22HF	22	350
		EDMH27*	DMH27HF	27	360
		EDMH30*	DMH30HF	30	400
	Stainless steel dowel (DM), material: S 355, incl. circular plastic sliding sleeve (H), for max. dowel length 500 mm and for transmission of lengthwise movement	EDMH20*	DMH20	20	300
		EDMH22*	DMH22	22	300
		EDMH27*	DMH27	27	300
		EDMH30*	DMH30	30	350
	Galvanised dowel (DFA), material: high-strength (HF), incl. circular plastic sliding sleeve (H), for max. dowel length 500 mm and for transmission of lengthwise movement	TDFAH20	DFAH20HF	20	340
		TDFAH22	DFAH22HF	22	350
		TDFAH25	DFAH25HF	25	360
		TDFAH30	DFAH30HF	30	400
	Galvanised dowel (DFA), material: S 355, incl. circular plastic sliding sleeve (H), for max. dowel length 500 mm and for transmission of lengthwise movement	TDFAH20	DFAH20	20	300
		TDFAH22	DFAH22	22	300
		TDFAH25	DFAH25	25	300
		TDFAH30	DFAH30	30	350

* Dowel with stainless steel casing.
The diameter indication for Egcodubel with stainless steel jackets refers to the external diameter.
The diameter of the steel core is the external diameter minus 2 mm.

Fire protection seal corresponding to fire resistance class F120

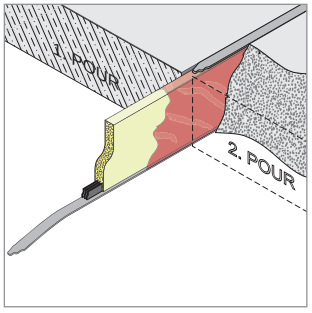
	Designation	Art. no.
	Please specify Egcodorn or Egcodubel type required. For standard dimensions, please specify joint width. Special dimensions are manufactured to your requirements.	EDBRAND

Fire protection joint F90

Designation	Art. no.	Joint thickness mm	Element length mm	Element height mm
We also produce complete joint solutions to fire resistance class F90, please contact our technical advisory service.	EDBRANDF	20/30/40/50	1200	according to the component thickness

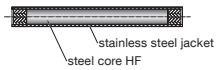
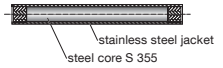
Other dimensions on request.

In order to guarantee the fire protection requirements for the entire expansion joint, we recommend using the FRANK fire protection joint. In the event of fire, joint openings of up to 10 mm can be sealed securely and the overall joint can be classified F90 and/or R90.



Egcodubel

Expansion joints/construction joints

	Designation	Art. no.	Type	Dowel diameter mm	Length of dowel mm
	Dowel with stainless steel sleeve and high-strength steel core	EDM20340*	DM20HF	20	340
		EDM22350*	DM22HF	22	350
		EDM27360*	DM27HF	27	360
		EDM30400*	DM30HF	30	400
		EDM37470*	DM37HF	37	470
	Dowel with stainless-steel sleeve, S 355 steel	EDM20300*	DM20	20	300
		EDM22300*	DM22	22	300
		EDM27300*	DM27	27	300
		EDM30350*	DM30	30	350
	Special-type dowels	EDMSONDER	DMØ	according to data given	
	Dowel – galvanised, high-strength steel	TDFA20340	DFA20HF	20	340
		TDFA22350	DFA22HF	22	350
		TDFA25360	DFA25HF	25	360
		TDFA30400	DFA30HF	30	400
	Dowel – galvanised, S 355	TDFA20300	DFA20	20	300
		TDFA22300	DFA22	22	300
		TDFA25300	DFA25	25	300
		TDFA30350	DFA30	30	350
	Dowel – galvanised, S 235	TQG18500	TQG18	18	500
		TQG20500	TQG20	20	500
		TQG22500	TQG22	22	500
		TQG25500	TQG25	25	500
		TQG28500	TQG28	28	500
	Dowel – galvanised, S 355; semi-clad with elastic material, expansion cap for one-dimensional movement	TDFAHB20500	DFAHB20	20	500
		TDFAHB22500	DFAHB22	22	500
		TDFAHB25500	DFAHB25	25	500
	Dowel – galvanised, S 235; semi-clad with elastic material, expansion cap for one-dimensional movement	TQGHB18500	TQGHB18	18	500
		TQGHB20500	TQGHB20	20	500
		TQGHB22500	TQGHB22	22	500
		TQGHB25500	TQGHB25	25	500
		TQGHB28500	TQGHB28	28	500
	Dowel - S 235 black, with full plastic coating	TQDVOLL25	TQDVOLL25	25	500

* Dowel with stainless steel casing.
The diameter indication for Egcodubel with stainless steel jackets refers to the external diameter.
The diameter of the steel core is the external diameter minus 2 mm.

Application-specific notes and dimensioning tables can be found in our brochure at www.maxfrank.com

Egcobox® cantilever connection system

In modern architecture cantilevers are a very popular construction feature. To prevent thermal bridging, insulated cantilever connection systems have been developed.

These approved systems with integrated thermal insulation materials allow designers to satisfy both the structural stability and thermal insulation regulations. The individual cantilever connector Egcobox® is a system approved since 1997. Egcobox® is characterised by its variability and meets all technical specifications of the current standards (EC and DIN).

As well as a comprehensive portfolio of standard elements, Egcobox® can be adapted to meet the exact requirements of any project. Bespoke elements can be produced to meet the requirements of individual buildings as the following parameters can be varied:

- Insulation thickness
- Insulation material
- Material or dimensioning of the frame
- Layout of the individual rebars (direction, position)
- Element shape can be adapted to suit the reinforcement layout provided by the customer
- Concrete cover and/or insulation overhang

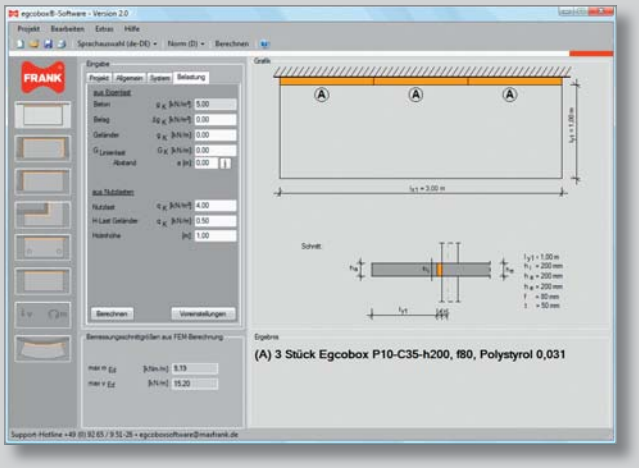
The versatility of Egcobox® means that it can be adapted to suit nearly every cantilever connection situation.
Our Technical Department can develop elements ideally combining the static and thermal bridging requirements for your building.

Egcobox® has been approved by the construction supervising authorities of the following countries:

- Germany – approval also applicable to design according to EC
- United Kingdom
- Netherlands
- Austria
- Poland
- Slovakia
- Czechoslovakia
- Hungaria

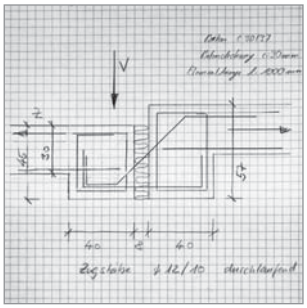
Egcobox® Software

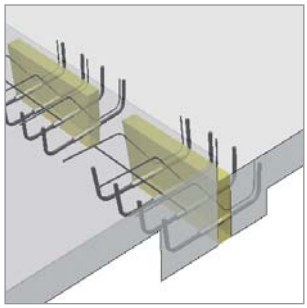
Our free-of-charge Egcobox® Software enables you to calculate correct dimensions for various balcony designs and loads. Ten different country standards are availble.
A PDF file containing approved structural calculations summarizes calculation results.
Furthermore use of this software enables the establishment of a clear order list of the calculated Egcobox® elements.
The Egcobox® Software is available for free-of-charge download from our website www.maxfrank.com.



Egcobox® special solutions

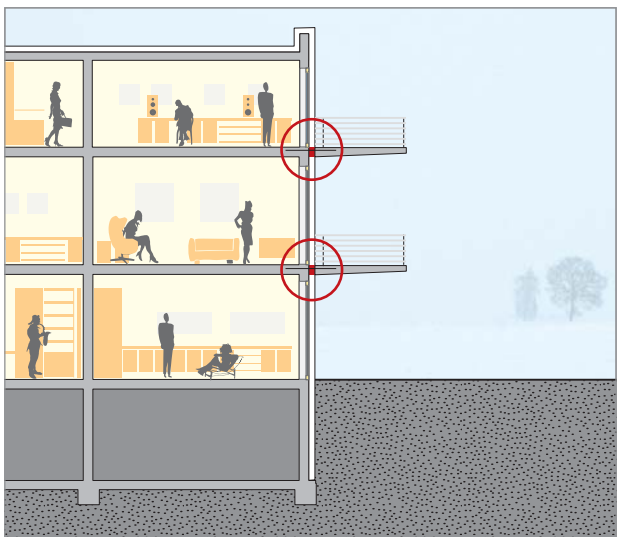
Our experienced engineers will be delighted to submit a proposal for special solutions.
Our ability to manufacture bespoke elements to suit the needs of individual buildings ensures that the best engineering and most economical solution is achieved.

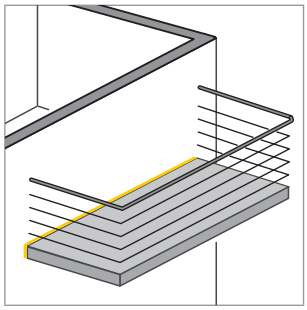

Idea

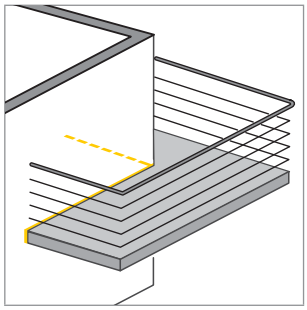

Solution

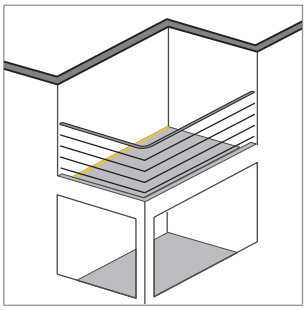

Production

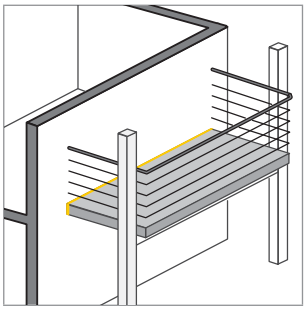

Installation

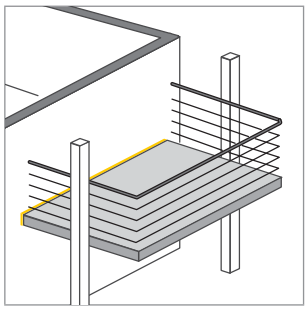


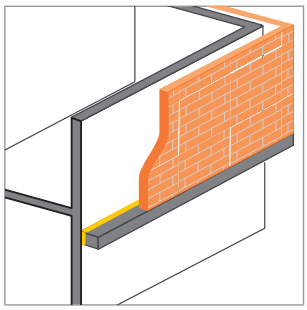

Cantilevered slab
(Type M)

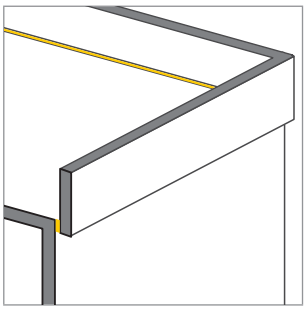

Inside edge
(Type M-Eck)

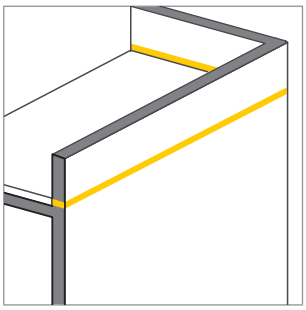

Loggia element
(Type M±)

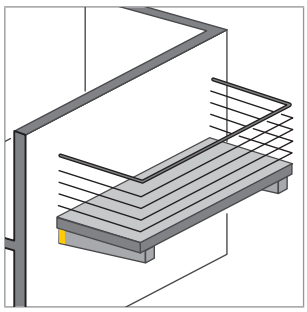

Supported slab
(Type V)

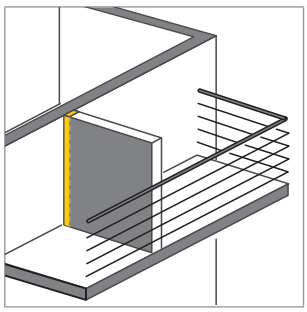

Supported cantilever plate
(Type V±)

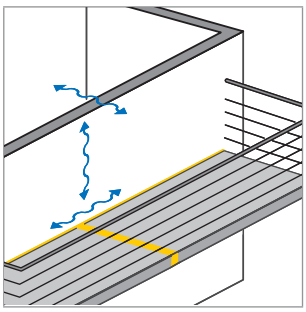

Console
(Type O)

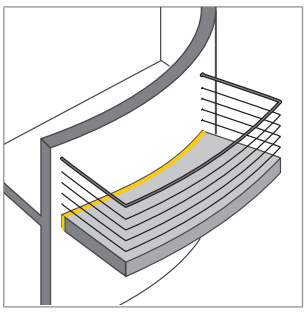

Breast wall
(Type F)


Segmental arch
(Type A)


Cantilevered beams
(Type S)


Wall element
(Type W)


Earthquake element
(Type M-VNH)


Special shapes

Example: Egcobox® MM50-VA-C35-h200-R90

Element type	Insulation thickness	Ultimate load level	Element shape	Transverse force reinforcement	Concrete cover	Element height	Fire resistance class	Insulating material
M	S	10	**–**	–	C30	h160	–	**–**
M±	**M**	20	**(Standard length)**	**VA**	**C35**	h170	R90-B	**(Polystyrene)**
V	L	30	K	VB	C40	h180	**R90**	MW
V±	XL	40	(Short element)		C45	h190		(Mineral wool)
O		**50**	Eck		C50	**h200**		FG
F		60	(Corner element)			h210		(Foam glass)
A		70				h220		SF
S		80				h230		(Styrofoam)
W		90				h240		
M-VNH		100				h250		
						h250		

SEALING TECHNOLOGIES

Depending upon their intended area of use, all high quality concrete structures should be watertight to prevent either the ingress or egress of water. FRANK offers a range of sealing systems to ensure a watertight seal for construction and expansion joints. FRANK also offers a range of stop-end formwork to ensure correct positioning of the sealing product. External water sources can be soil humidity, ground water or water leakage from another source.

A “white tank” construction for watertight structures ensures compliance with appropriate guidelines. The chosen sealing method will depend upon many factors including water properties, structural type, loadings and intended use.

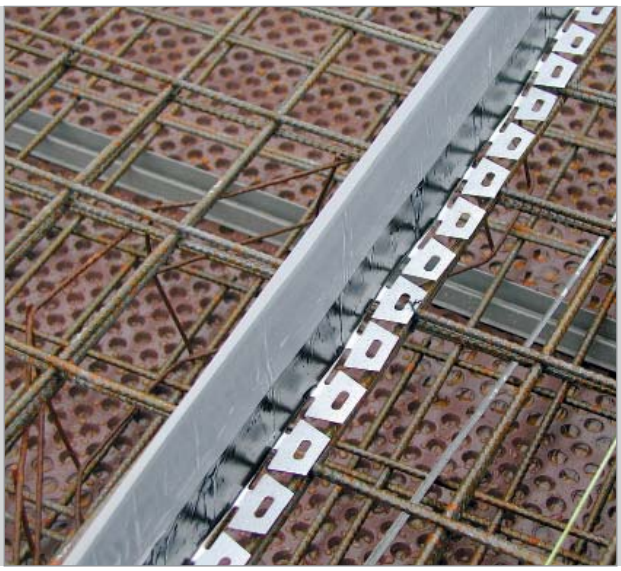
- Fradiflex metal water stop
- Waterbars
- Intec injection hose system
- Injection material
- Cresco expanding waterstop
- Permur liner pipes

Fradiflex metal water stop

Sealing of joints in concrete structures requires a very reliable sealing system.

Fradiflex, galvanised or stainless steel metal water stop with a special 1 mm thick coating exceeds these requirements. With a roll length of 25 m, not only is it a cost effective sealing solution, but with fewer joints it also provides security and efficiency in use.

For special applications Fradiflex can also be supplied in straight lengths of 2.1 m.



Just unroll the 25 m Fradiflex roll with the special coating facing the water retaining side.

Before fixing the metal water stop to the reinforcement, strip off the lower protective film.

Then joints are simply overlapped over a length of 100 mm, the ends pressed against each other and then secured by means of the included Fradiflex clamp strap.

For angled and round construction joints simply bend the metal water stop to the required shape.

Test certificates

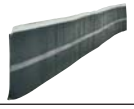
Technical University of Munich

- General test certificate issued according to the regulations of the construction supervising authorities

According to the WU guideline of the DAfStb Fradiflex can be used as per the requirements of utility classes A and B and of straining classes 1 and 2.

Fradiflex Standard

galvanised steel with one-sided coating for a watertight concrete construction joint

	Designation	Art. no.	Width mm	Weight kg/carton	Weight kg/pallet
	Fradiflex standard metal water stop with fixing angle, roll length 25 m, packaging: incl. 2 pcs. clamp straps, 36 cartons/pallet, 900 m/pallet	FFBRE122500BW	120	22.00	812
		FFBRE152500BW	150	25.00	920
	Fradiflex standard metal water stop, roll length 25 m, packaging: incl. 2 pcs. clamp straps, 36 cartons/pallet, 900 m/pallet	FFBRE122500	120	20.00	740
		FFBRE152500	150	24.00	884
	Fradiflex standard metal water stop straight, strip length 2.1 m, packaging: incl. 58 pcs. clamp straps, 50 pcs./box, 10 boxes/pallet, 1050 m/pallet.	FFBGE120210	120	84.00	860
		FFBGE150210	150	101.00	1030

Fradiflex Premium

galvanised steel with double-sided coating for a watertight concrete construction joint

	Designation	Art. no.	Width mm	Weight kg/carton	Weight kg/pallet
	Fradiflex Premium metal water stop with fixing angle, roll length 25 m, packaging: incl. 2 pcs. clamp strap, 36 cartons/pallet, 900 m/pallet	FFBRZ122500BW	120	22.00	812
		FFBRZ152500BW	150	25.00	920
	Fradiflex Premium metal water stop, roll length 25 m, packaging: incl. 2 pcs. clamp straps, 36 cartons/pallet, 900 m/pallet	FFBRZ122500	120	20.00	740
		FFBRZ152500	150	24.00	884
	Fradiflex Premium metal water stop straight, length 2,1 m, packaging: incl. 58 pcs. clamp straps, 50 pcs./case, 10 cases/pallet, 1050 m/pallet	FFBGZ120210	120	84.00	860
		FFBGZ150210	150	101.00	1030

Fradiflex Premium joint (V4A stainless steel, Grade 316 equivalent)

stainless steel with double-sided coating for a watertight concrete construction joint in chloride rich environments (e.g. sea water)

	Designation	Art. no.	Width mm	Weight kg/carton	Weight kg/pallet
	Fradiflex Premium metal water stop in V4A, with fixing angle, roll length 25 m, packaging: incl. 2 pcs. clamp strap, 36 cartons/pallet, 900 m/pallet	FFBRZ122500BWSS	120	22.00	812
	Fradiflex Premium metal water stop in V4A, roll length 25 m, packaging: incl. 2 pcs. clamp straps, 36 cartons/pallet, 900 m/pallet	FFBRZ152500SS	150	24.00	884

Fradiflex mounting clip

for strip heights 120 and 150 mm

	Art. no.	Weight kg/bundle	Pack size
	FFBBUEG01	7.50	50 pcs./bundle

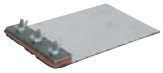
Fradiflex clamp strap

for fixing overlapping joints

	Art. no.	Weight kg/bundle	Pack size
	FFBBUEG03	2.50	125 pcs./bag

Fradiflex expansion joint connector

for joining Fradiflex to pvc/rubber waterbars

	Art. no.	Height h mm	Weight kg/carton	Pack size
	FFBDA12	120	0.80	2 pcs./carton
	FFBDA15	150	1.20	2 pcs./carton

Fradiflex special sealing tape

for coating metal water stop

	Art. no.	Width mm	Length m	Weight kg/roll
	YBUTYLKB050	50	15,00	1,17
	YBUTYLKB100	100	15,00	2,33

Fradiflex elements for controlled crack joints

with coated metal water stop

	Designation	Art. no.	Length m	Weight kg/pce.
	Fradiflex component controlled crack induction in-situ concrete applications, incl. 2 clamping brackets, crack plate width 2 x 50 mm	FFBSRO250	2.50	7.80
		FFBSRO300	3.00	12.00

Suitable for component thicknesses of up to 30 cm. Further designs upon request.

Fradiflex corner component

	Designation	Art. no.	Weight kg/pce.
	Fradiflex corner component, required for use with Fradiflex controlled crack inducer corner flashing, height 200 mm, incl. 2 clamp straps	FFBECKE	2.30

As they are coated on both sides, Fradiflex corner elements and the Fradiflex controlled crack inducer corner strips can both be used both internally and externally for the wall elements to be concreted.

Fradiflex element wall's controlled crack joint/crack corner flashing

	Designation	Art. no.	Element length m	Weight kg/pce.
	Fradiflex wall controlled crack inducer joint flashing, incl. 2 clamping brackets, crack plate width 2 x 30 mm	FFBSRF	2.50	6.50
		FFBSRF300	3.00	8.20
	Fradiflex wall controlled crack inducer corner flashing, incl. 2 clamping brackets, crack plate width 100 mm	FFBSRE	2.50	8.40
		FFBSRE300	3.00	10.10

Suitable for wall thicknesses of up to 30 cm. Special designs upon request. Fradiflex corner elements and the controlled crack inducer corner strips are suitable for both inside and outside of the wall elements to be concreted due to their bilateral coating.

Fradiflex fixing loop for controlled crack joint / crack corner flashing

	Designation	Art. no.	Pack size	For wall thickness mm	Weight kg/bundle
	Fradiflex fixing loop for controlled crack joint flashing	FFBBUEG24F	20 pcs./bundle	240	3.00
		FFBBUEG30F	20 pcs./bundle	300	3.00
	Fradiflex fixing loop for controlled crack corner flashing	FFBBUEG24E	10 pcs./bundle	240	2.20
		FFBBUEG30E	10 pcs./bundle	300	2.20
	Fradiflex mounting clip for wall crown	FFBBUEGK	20 pcs./bundle	240-300	2.60

FRANK Waterbar Type AA – External

for construction joints

Art. no.	Overall width a	Width of expandable section b	Nominal thickness c	Nib height f	Number of nibs N	Roll length m	Pallet unit m	Weight kg/m	Weight kg/pallet
FFAFBA19	190	65	4	15	4	25	150	1.25	208
FFAFBA24	240	90	4	20	4	25	125	1.60	220
FFAFBA32	330	105	4	20	6	25	100	2.30	250

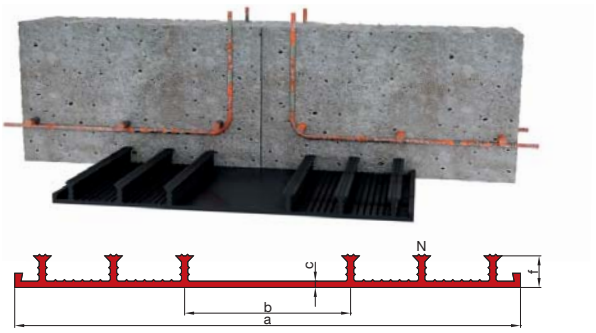
Orders to be placed in full pallet quantities only

FRANK Waterbar FLEX – Internal

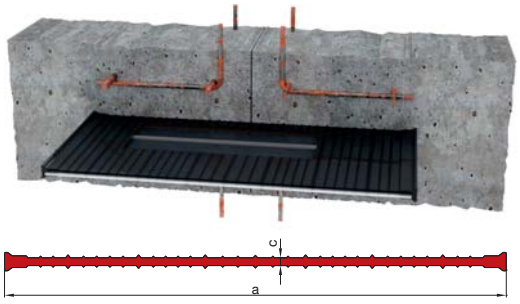
for construction joints

Art. no.	Overall width a	Thickness of expandable section c	Roll length m	Pallet unit m	Weight kg/m	Weight kg/pallet
FFAFB19	190	4.5	25	250	1.50	395
FFAFB24	240	4.5	25	250	1.85	483
FFAFB32	320	5.0	25	150	2.80	440

Orders to be placed in full pallet quantities only



FRANK Waterbar Type AA – External



FRANK Waterbar FLEX – Internal

FRANK Waterbar Type D – Internal

for movement joints

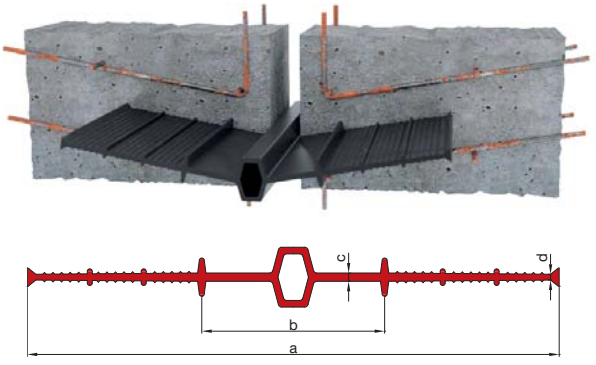
Art. no.	Overall width a	Width of expandable section b	Nominal thickness c	Minimum thickness d*	Roll length m	Pallet unit m	Weight kg/m	Weight kg/pallet
FFDID19	190	65	3.5	2.5	25	250	1.15	308
FFDID24	240	80	4.0	3.0	25	125	1.50	208
FFDID32	320	110	5.0	3.5	25	100	2.30	250

* Thickness can decrease from the nominal thickness (c) to the minimum thickness (d) outside the expandable section.

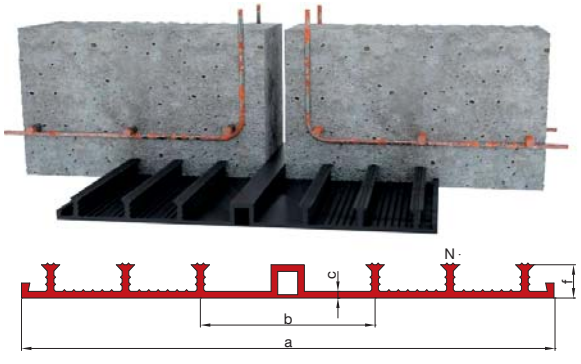
FRANK Waterbar Type AD – External

for movement joints

Art. no.	Overall width a	Width of expandable section b	Nominal thickness c	Nib height f	Number of nibs N	Roll length m	Pallet unit m	Weight kg/m	Weight kg/pallet
FFDAD19	190	92	4	17	4	25	150	1.30	215
FFDAD24	240	90	4	20	4	25	125	1.80	245
FFDAD32	330	105	4	20	6	25	100	2.50	270



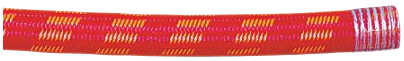
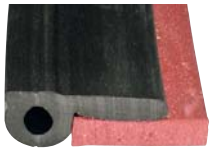
FRANK Waterbar Type D – Internal



FRANK Waterbar Type AD – External

FRANK's Intec injection hose system ensures secure, simple and rapid sealing of horizontal and vertical construction joints. Intec hose systems have been specified and used by architects, clients and construction companies for over 20 years due to the technical advantages of the hoses over all other types of water stop.

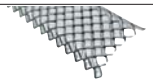
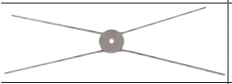
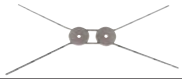
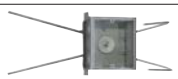
Intec injection hoses are supplied in four different types to suit varying application conditions and the required injection material.
An extensive range of Intec accessories ensure a quick and easy installation process.
A full range of Intectin injection resins approved for use with the various Intec injection hose systems provide an appropriate solution for all sealing situations.

Description	Possible injection material					Number of injections possible		Test
	PUR	EP	Acrylic	Cement suspension	Cement paste	one	multiple	General approval
Intec Standard 	■	■	■			■		■
Intec Premium Suitable for multiple injection with PUR resin and other resins. Hose draining by flushing under pressure. 	■	■	■			■	■	■
Intec Cem N Can be grouted several times with cement suspension, PUR resin, and other resins. Hose draining by vacuum generation. (Inner diameter 10 mm) 	■	■	■	■	■	■	■	■
Intec Combi 	■	■	■			■	■	■

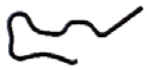
Intec injection hose systems

	Designation	Art. no.	Pack size
	Intec standard injection hose (for single injections), for injection with resins only, tested and certified to international construction standards.	IVINTECN	100 lin. m/roll
	Intec Premium injection hose (for multiple injections) for initial and repeated injection with resins only, tested and certified to international construction standards.	IVINTEC	100 lin. m/carton
	Intec Cem N injection hose (for multiple use), I.D. 10 mm, for initial and repeated injections with resins and cements, tested and certified to international construction standards.	IVPSCEMN	50 lin. m/roll
	Intec Combi combined injection hose and expanding waterstop, incl. 5 corner connectors, for injection with certified resins, tested and certified to international construction standards.	IVCOMBI	50 lin. m/roll

Accessories for Intec Standard, Intec Premium and Intec Combi

	Designation	Art. no.	Pack size
	Shutter connector blue	INPACKB	20 pcs./carton
	Shutter connector yellow	INPACKG	20 pcs./carton
	90° corner connector for Intec Combi Ø 5 mm	IECKV5	20 pcs./bag
	Fixing mesh for Intec Combi, 100 cm long	QBSSBG	30 m/carton
	Fixing nail for Intec Combi 52 mm long, with pre-attached disk suitable for nailgunning	QUBNAGEL	100 pcs./carton
	Schnappi tie (suitable for green concrete or Ø 8 mm drill holes, approx. 6 per 1 m required)	ISCHNC	100 pcs./bag
	Metal clip with nail plug suitable for Ø 5 mm drill holes (approx. 6 per 1 m required)	IMSCHEL	100 pcs./carton
	Intec clip made of plastic, with pre-fitted nail, suitable for nail gun (approx. 6 per 1 m required)	IKSCHEL	100 pcs./carton
	Metal clip with pre-fitted nail, suitable for nail gun (approx. 6 per 1 m required)	IMSHILT	100 pcs./carton
	Foam plastic connector for taking up variation in spacing between shutter connector and formwork	IDICHTI	20 pcs./bag
	Napa shutter spider (adjustable) used to fix the shutter connector to the reinforcement	INAPASP	–
	Double shutter spider	INAPADSP	–
	Steel connector	IVVPSL	–
	Recessed access box with lid, for embedding and protected storage of the injection hose ends in the concrete	IVDOSE	–
	Intec injection hose end pieces dia. 4 mm, breather tube with a steel connector piece and an end cap, length 400 mm	IVERPE	–

Accessories for Intec Standard, Intec Premium and Intec Combi

	Designation	Art. no.	Pack size
	Internal hose end connector with conical-head nipple, incl. one hose clip, to fit breather tube	IINPACK	–
	Water stop clip 1 – for fixing of injection hose to metal water stops	IFBK	100 pcs./bag
	Water stop clip 2 for elastomer waterbars, fixation of injection hose	IFBK2	100 pcs./bag
	Water stop clip 3 – for lateral fixing of injection hose to metal water stops	IFBK3	–
	Water stop clip 4 – for lateral fixing of injection hose to metal water stops	IFBK4	–
	Conical-head nipple with extra-long thread (1 piece per shutter connector required)	IRKKNI	–
	Conical-head nipple without non-return valve, used only for flushing under pressure	IRKKNIN	–
	Socket spanner for conical-head nipple	ISTSKK	–
	Hand pump complete with high-pressure armoured hose and grip valve	IHPRESS	–
	Hydraulic manometer 0 to 160 bar	IHMANOM	–
	T-piece for connecting manometer to hand pump	ITSTHM	–
	Replacement sealing ring for the hand press	IHPDICH	–
	Grip valve fits conical-head nipple	IEGRKOP	–
	Replacement high-pressure armoured hose 500 mm long. The high-pressure armoured hose can also be inserted directly into the shutter connector.	IHDPS0500	–
	Adapter with 2 internal threads M10 x 1.0, used for extension of replacement high-pressure armoured hoses	IAHDPS	–
	Mixer paddle for drill	IRWBOR	–

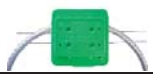
Accessories for Intec Standard, Intec Premium and Intec Combi

	Designation	Art. no.
	Breather tube, inner diameter 4 mm, 25 bar	IENTLSL

Filament tape

	Designation	Art. no.	Pack size
	Filament tape	IFIBAND	roll à 50 m

Accessories for Intec Cem N – inner diameter 10 mm

	Designation	Art. no.	Pack size
	Shutter connector	ICEMPACK	–
	Cut connector with 10 mm IG	ISPACK2	–
	Metal clip with nail plug	IMSCHEL18	100 pcs./carton
	Metal clip with pre-fitted nail, suitable for nail gun	ICEMHILT	100 pcs./carton
	Plastic coupling for Intec Cem N and breather tube Ø 10 mm	ICEM10K	–
	Steel connector	ICEM1111AD	–
	Connector for Intec Cem N or breather tube Ø 10 mm at M10	ICEM1011AD	–
	Double ear clamp Ø 17-18 mm for Intec Cem N and breather tube Ø 10 mm	ICEMS18	100 pcs./bag
	End piece with connector (M10) for common injection grips	ICEMVER	–
	End cap for breather tube Ø 10 mm	IENTLK10	–
	Adapter (M10 x 1.0 external / M6 external), connector between the Intec injection hose end (breather tube dia. 4 mm) and the flat-headed nipple or between the disk packer/screw packer dia. 13 mm and the flat-headed nipple	ICEM1006AD	–
	Adapter (M10 x 1.0 external / M10 x 1.0 external), connector between shutter connector and flat-headed nipple	ICEM1010AD	–
	Press-on coupling for use with flat-headed nipple	ICEM10SK	–
	Flat-headed nipple with non-return valve	ICEM10N	–
	Recessed access box with lid, for embedding and protected storage of the injection hose ends in the concrete	IVDOSE2	–

Accessories for Intec Cem N – inner diameter 10 mm

	Designation	Art. no.
	Breather tube Ø 10 mm, 25 bar	IENTLSL10

Important instructions for injection hose laying

- Lay the injection hose centrally in the section. In case of wide sections (d > 600 mm) the injection hose should be located approx. 250 mm away from the water retaining face.
- The injection hose should not, under any circumstances, be too close to the formed concrete surface or in contact with it. Concrete cover ≥ 50 mm
- The injection hose must not be located outside the wall.
- The injection hose must be securely fixed, so that movement or flotation during concreting is prevented (fixing interval s ≈ 150 mm).
- The injection hose may only be used in construction joints, not in expansion joints.
- A shutter connector or a breather tube must be connected to the beginning and to the end of each circuit.
- The length of the individual injection circuits should not be greater than approx. 10 m. To use greater lengths please contact our Technical Department.
- The shutter connector should be placed in a location which is easy to access at a later date.
- If there is heavy water outflow from the shutter connectors, screw the conical-head nipples into the shutter connectors in order to prevent them from clogging.

Injection material

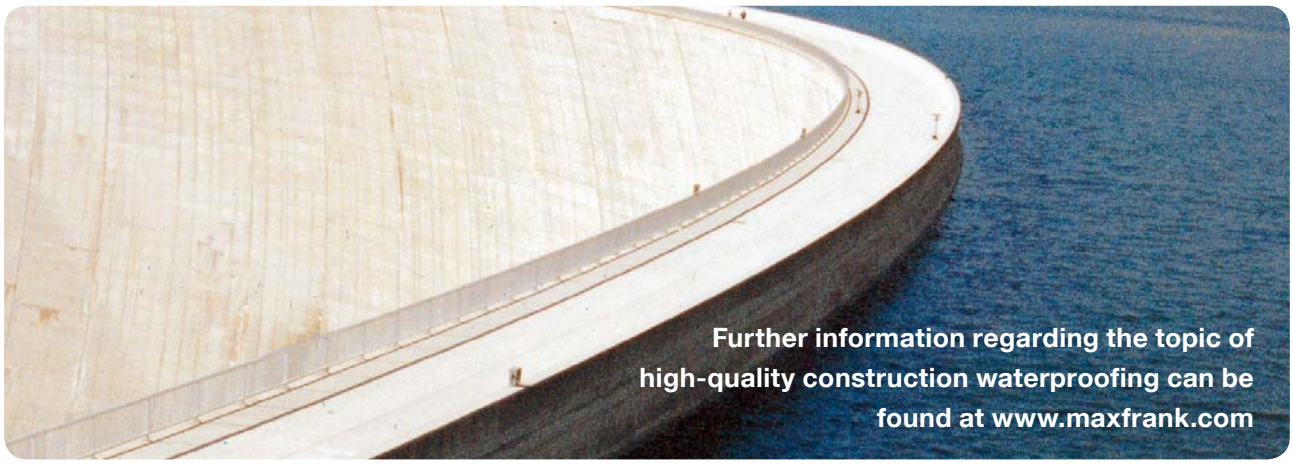
FRANK's extensive range of injection resins offers an appropriate solution for your sealing requirements.

Intec injection materials

Designation	Art. no.	Weight kg/pce.
Intectin Plus PUR resin according to DIN-EN 1504-5 with CE mark and drinking water suitability test according to KTW recommendation. Suitable for hose pressing and crack injection. The resin is low-viscosity and hardens elastically.	IPUP01	1.00
Intectin EP, two-component contact epoxy resin for force-fit crack sealing or also for force-fit/filling hose injection, suitable for dry and damp surfaces	IPIH01	1.00
	IPIH05	5.00
	IPIH10	10.00
Intectin Blitz PUR resin (incl. accelerator) – foams in contact with water and stops the water flow, accelerator content: approx. 10%	IPUHB01	1.00
	IPUHB05	5.00
Intectin Acrylic Resin, low-viscosity two-component acrylic injection resin, approved for drinking water applications to KTW recommendations. Water-soluble before hardening – swells on contact with water after hardening. Particularly suitable for reusable injection hoses. Working temperature down to 0°C. Anti-corrosive due to active corrosion protection.	IPAH10	10.00

Designation	Art. no.	Weight kg/pce.
Accelerator for Intectin Plus and Intectin Blitz	IPUHBB001	0.10

Designation	Art. no.	Pack size Litre
Intectin Special Cleaner, suitable for PUR and EP resins	IPUSR01	1
	IPUSR05	5
	IPUSR10	10



Metal disk packer for crack injection

	Designation	Art. no.
	Metal disk packer incl. conical-headed nipple with an internal thread M6. For glueing and tamping we recommend the FRANK special filler in 1 kg packs.	IKPACK

Steel nails for crack injection

Designation	Art. no.	Pack size
Steel nails 2 x 50 mm, for the use in connection with the disk packer, to secure crack access	IKPACKN	100 St.

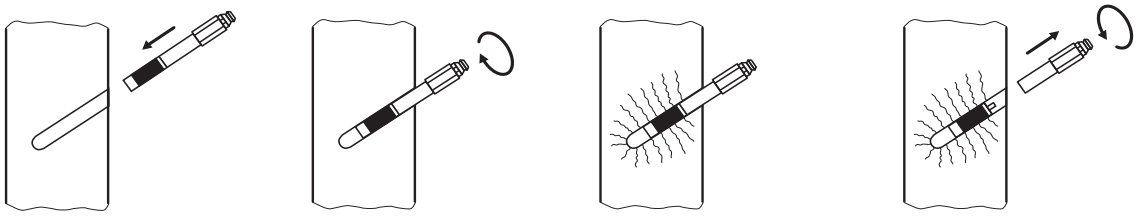
Special filler for crack injection

Special filler standard colour caramel and grey. Quick setting filler for fixing metal disk packers and for crack injection.
For further information, please refer to page 69.

Crack injection materials

	Designation	Art. no.	Connector Ø mm	Drill Ø mm	Connector length mm	Pack size piece
	Impact drill packer for resin injection, plastic lamellar packer, incl. conical-headed nipple	IBSP10	10	10	65	100
	Screw packer. All packers come with a conical-headed nipple	ISP08075	8	8	75	100
		ISP10100	10	10	100	100
		ISP13075	13	14	75	100
		ISP13100	13	14	100	100
		ISP13150	13	14	150	100
	Screw packer with foot valve incl. conical-headed nipple for the 1-day building site	ISP10100FV	10	10	100	100
		ISP13100FV	13	14	100	100

Threaded seal with a drain valve for immediate applications



(1) Lay the packer

(2) Fully tighten the packer

(3) Inject sealant

(4) The packer shaft can be screwed off immediately afterwards

Cresco expanding waterstop

The Cresco range of expanding waterstops are used for effective sealing of construction joints.
Application areas are varied and include:
Sealing of wall/slab joints, pipe penetrations, and anywhere where new and old concrete are joined.

Technical specifications and function:

Cresco expands on contact with water and the expansive pressure arising ensures a tight seal in the construction joint.

Cresco BT expanding waterstop

- Sodium bentonite based product
- Expands by up to 350 % of its original volume
- Forces itself into even the finest cracks
- Simple and fast fixing using Cresco mounting glue
- Resistant to degradation and flushing out
- Outstanding profile stability with sure reversible swelling properties

Cresco PU expanding waterstop

- Polyurethane based product
- Expands by up to 400 % of its original volume
- Resistant to degradation
- Simple and fast fixing using Cresco mounting glue
- Slow delayed controlled swelling
- Outstanding profile stability with sure reversible swelling properties

Cresco AC expanding waterstop

- Acrylate polymer based product
- Expands by up to 250 % of its original volume
- The 25 mm x 6 mm profile avoids concrete spalling
- Exceptional resistance to chemical attack
- Expands in a controlled manner with long-lasting swelling capacities
- Outstanding profile stability with sure reversible swelling properties

Cresco BT expanding waterstop

Art. no.	Dimensions mm	Roll length m	Carton contents piece	Cartons/pallet	Weight kg/m	Weight kg/pallet
QUBCRESBT25	20 x 25	5	4	56	0.63	726

Cresco PU expanding waterstop

Art. no.	Dimensions mm	Roll length m	Carton contents piece	Cartons/pallet	Weight kg/m	Weight kg/pallet
QUBCRESPU	20 x 10	5	10	24	0.22	284

Cresco AC expanding waterstop

Art. no.	Dimensions mm	Roll length m	Carton contents piece	Cartons/pallet	Weight kg/m	Weight kg/pallet
QUBCRES	25 x 6	15	6	30	0.24	668

Cresco fixing glue / expanding waterstop

for fixing of expanding waterstops

Art. no.	Carton contents piece	Cartons/pallet	Weight kg/pce.	Weight kg/carton
QUBMKL	20	60	0.50	10.00

310 ml cartridge is sufficient for 8 – 10 m;
MS-polymer-hybrid glue also resistant to weathering and UV radiation.

Cresco fixing rail

for Cresco BT

Art. no.	Carton contents piece	Length cm	Weight kg/m	Weight kg/carton
QBSSBG	30	100	0.05	1.50

Cresco fixing nail

Art. no.	Pack size	Length mm	Weight kg/pce.	Weight kg/carton
QUBNAGEL	100 pcs./carton	52	0.01	0.72

with pre-attached disk suitable for nailgunning
(only in conjunction with fixing mesh)

Test certificates

- General test certificate issued according to the regulations of the construction supervising authorities
- Corresponds to recent WU-guideline, also suitable for areas of alternating moisture penetration

Permur liner pipes

With the Permur system we provide a durable wall penetration in areas with and without hydraulic pressure.

The ideal combination of Permur seal insert and Permur fibre cement pipe guarantees a simple and safe solution additionally backed by an independent test certificate.

PFR – Permur fibrous cement pipes

Art. no.	PFR Ø inside mm	Lengths up to mm
PFR10000800250	80	250
PFR10000800300	80	300
PFR10000800400	80	400
PFR10000800500	80	500
PFR1000080FIX	80	1200
PFR10001000250	100	250
PFR10001000300	100	300
PFR10001000400	100	400
PFR10001000500	100	500
PFR1000100FIX	100	1200
PFR10001250250	125	250
PFR10001250300	125	300
PFR10001250400	125	400
PFR10001250500	125	500
PFR1000125FIX	125	1200
PFR10001500250	150	250
PFR10001500300	150	300
PFR10001500400	150	400
PFR10001500500	150	500
PFR1000150FIX	150	1200
PFR10002000250	200	250
PFR10002000300	200	300
PFR10002000400	200	400
PFR10002000500	200	500
PFR1000200FIX	200	1200

PFR – Permur fibrous cement pipes

Art. no.	PFR Ø inside mm	Lengths up to mm
PFR10002500250	250	250
PFR10002500300	250	300
PFR10002500400	250	400
PFR10002500500	250	500
PFR1000250FIX	250	1200
PFR10003000250	300	250
PFR10003000300	300	300
PFR10003000400	300	400
PFR10003000500	300	500
PFR1000300FIX	300	1200
PFR10003500250	350	250
PFR10003500300	350	300
PFR10003500400	350	400
PFR10003500500	350	500
PFR1000350FIX	350	1200
PFR10004000250	400	250
PFR10004000300	400	300
PFR10004000400	400	400
PFR10004000500	400	500
PFR1000400FIX	400	1200
PFR10005000250	500	250
PFR10005000300	500	300
PFR10005000400	500	400
PFR10005000500	500	500
PFR1000500FIX	500	1200

Further diameters up to 800 mm upon request.

PFR – fixing aid for Permur fibre-cement pipes

The PFR-fixing aid fixes the fibre-cement pipe securely and simply to the existing formwork.

Please note:

When using the fixing aid, take into account its thickness. Therefore order a PFR Permur fibre-cement pipe, the length of which is 20 mm shorter than the wall thickness.

PFR – fixing aid for Permur fibre-cement pipes

Art. no.	DN mm
PFRMD100	100
PFRMD125	125
PFRMD150	150
PFRMD200	200
PFRMD250	250
PFRMD300	300

PFR – accessories for Permur fibre cement pipe

Art. no.	description	Length mm
GEWSKM30	Hexagon nut SW 30	30
GEW15SONL	Tie bar Ø 15 mm, cut to length and bevelled	variable

For formwork anchor accessories, please refer to the price list on page 70.

Permur Block – pre-fabricated fibre reinforced concrete block for pipe penetrations

Permur block multiple penetration – developed specifically for use with brickwork, in order to provide for a simple and practicable design of the house connection of supply lines such as water, power, or telecommunications.

Permur block single penetration – developed specifically for use with brickwork, in order to provide for the feed-through of single waste disposal lines such as for waste water.

All Permur blocks are thermally insulated, with the heat insulation being be tailored according to the thickness of the brickwork.

Permur block – multiple penetration

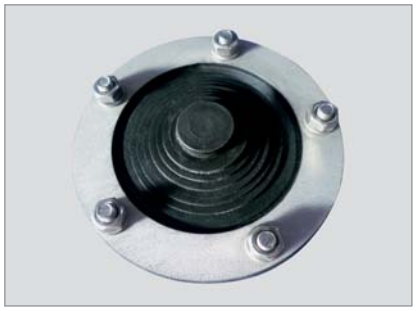
suitable for multiple supply lines

Art. no.	Dimensions mm	Penetrations pcs.	Drillhole Ø mm
PFRMSP1	249 x 249 x 365	4	80

Permur block – single penetration

suitable for waste disposal lines

Art. no.	Dimensions mm	Penetrations pcs.	Drillhole Ø mm
PFRMSP2	249 x 249 x 365	1	150



PDE – Permur multi-layer sealing kit

suitable for use with Permur block multiple penetration

Art. no.	Liner pipe or core boring NW mm	External Ø medium pipe mm
PDE1000800VAR	80	18 – 45

Single piece insert

Two part insert

PDE-Permur sealing inserts are used to seal the annular gap between a circular chase cast in a concrete wall and a medium pipe.

In areas with “pressing water”, we recommend Permur seal inserts made of stainless steel.

PDE – Permur stainless steel seal insert – closed design pressure plates/screws V2A

Tested to 5 bar – EPDM seal

Art. no.	Liner pipe or core boring NW mm	External Ø medium pipe mm
PDE1000500120	50	6 – 12
PDE1000700320	70	24 – 32
PDE1000700410	70	32 – 41
PDE100080000	80	blind
PDE1000800280	80	20 – 28
PDE1000800400	80	32 – 40
PDE100100000	100	blind
PDE1001000280	100	20 – 28
PDE1001000320	100	25 – 32
PDE1001000400	100	32 – 40
PDE1001000440	100	36 – 44
PDE1001000560	100	46 – 56
PDE1001000650	100	55 – 65
PDE100125000	125	blind
PDE1001250640	125	55 – 64
PDE1001250700	125	61 – 70
PDE1001250780	125	70 – 78
PDE100150000	150	blind
PDE1001500540	150	46 – 54
PDE1001500660	150	56 – 66
PDE1001500780	150	69 – 78
PDE1001500910	150	79 – 91
PDE1001500940	150	85 – 94
PDE1001501100	150	98 – 110
PDE100200000	200	blind
PDE1002001030	200	88 – 103
PDE1002001150	200	108 – 115
PDE1002001260	200	116 – 126
PDE1002001280	200	119 – 128
PDE1002001410	200	132 – 141
PDE1002001440	200	135 – 144
PDE1002001600	200	150 – 160
PDE1002501440	250	135 – 144
PDE1002501490	250	140 – 149
PDE1002501590	250	150 – 159
PDE1002501620	250	157 – 162
PDE1002501650	250	156 – 165
PDE1002501750	250	165 – 175
PDE1002501810	250	174 – 181
PDE1002501870	250	178 – 187
PDE1002502020	250	197 – 202
PDE1002502100	250	204 – 210
PDE1003001870	300	178 – 187
PDE1003002040	300	193 – 204
PDE1003002070	300	198 – 207
PDE1003002260	300	218 – 226
PDE1003502330	350	224 – 233
PDE1003502580	350	249 – 258
PDE1003502820	350	270 – 282
PDE1004002800	400	270 – 280
PDE1004002880	400	279 – 288
PDE1004003130	400	304 – 313
PDE1004003230	400	314 – 323
PDE1004003300	400	320 – 330

Other sizes and separated versions can be supplied – price and delivery time on request.
Seal inserts can also be supplied in V4A material – price on request.
Stainless steel inserts can also be manufactured with materials suitable for drinking water applications according to the KTW recommendations – prices on request.

Test certificates

MFPA Leipzig

- Watertight to 5 bar

Multiple lead-throughs

PDE – Permur stainless steel seal insert – multiple penetration pressure plates / screws V2A

Art. no.	Liner pipe or core boring NW mm	External Ø medium pipe mm
PDE10MF100	100	according to requirement
PDE10MF125	125	
PDE10MF150	150	
PDE10MF200	200	
PDE10MF250	250	
PDE10MF300	300	
PDE10MF350	350	
PDE10MF400	400	

Prices valid for seal insert sets with max. 3 leadthroughs – extra cost for each additional leadthrough + 10%.
Other sizes are available – prices and delivery time on request.
Seal inserts can also be supplied in V4A-material. – Prices and delivery time on request.
Stainless steel seal inserts can also be manufactured from materials suitable for drinking water applications – according to the KTW recommendations. Prices on request.

PDE – Permur galvanised seal insert – simple version

suitable for Permur fibre cement pipes

Art. no.	Liner pipe or core boring NW mm	External Ø medium pipe mm
PDE2101501120	150	108 – 111
PDE2102001130	200	108 – 112
PDE2102001270	200	123 – 126
PDE2102501630	250	157 – 162
PDE2103002050	300	199 – 204

Other sizes are available – prices and delivery time on request.

Permur – galvanised seal inserts – simple version – reliably seal wall leadthroughs against soil humidity.

Permur ring seal Link-Seal®

The flexible set of seals

Price and delivery time on request for all common types of media pipes and leadthrough diameters, also suited for large diameters.
With TÜV approval (TÜV South Germany).

BUILDING ACOUSTICS

FRANK's range of building acoustic products provide designers with solutions to the increasing demand for sound insulation, e.g. impact sound reduction in staircases.

- Egcotritt and Egcosono for acoustic decoupling of stair landings and exterior corridors
- Egcostep and Egcoscal for stair flight decoupling
- Egcodist wall and floor bearings
- Egcovoid former

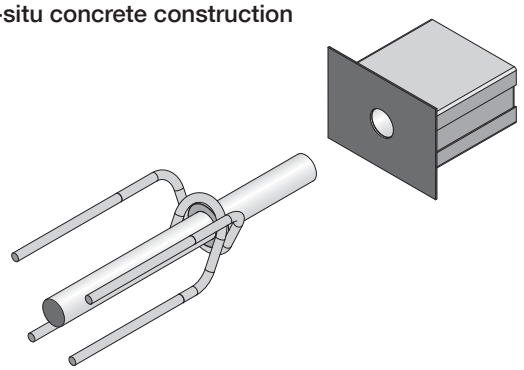
Egcotritt

The Egcotritt system is a thrust force dowel connection (dowel part/acoustic box) for structural elements made of concrete, reinforced concrete or masonry, for which acoustic decoupling is required.

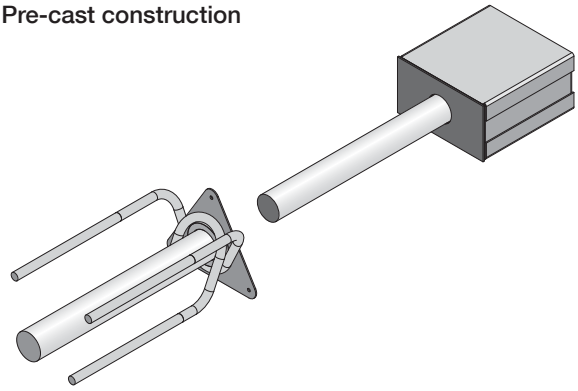
Egcotritt prevents impact sound transmission in the staircase, it acoustically decouples, provides the required stair bedding and ensures separation from other structural elements. Egcotritt is an economic, simple and secure solution to impact sound transmission problems in stair landings, stair flights, supported balconies etc. Egcotritt fulfils fully the impact sound transmission reduction requirements that eminently improve the living quality of structures.

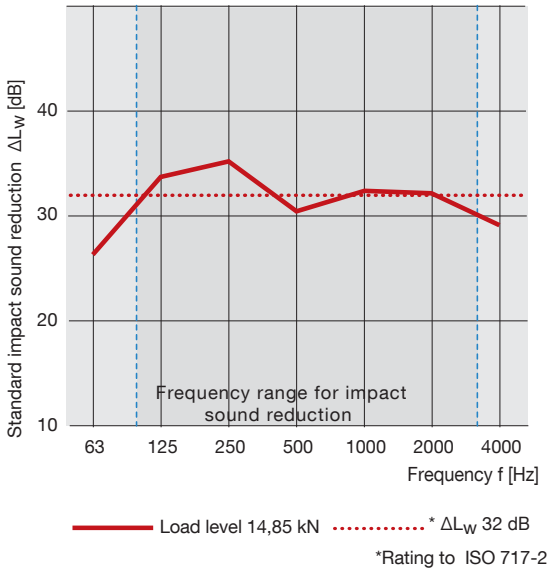
- Transverse force connection with impact sound reduction of up to ΔL_W 32 dB
- Joint width up to 100 mm
- Fire resistance class F120 possible

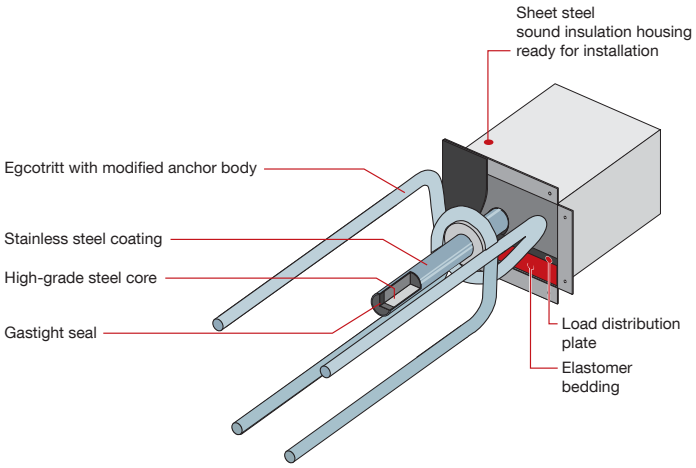
In-situ concrete construction



Pre-cast construction







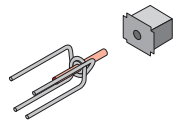
More detailed technical information and design values can be found in our brochure “Building Acoustics”.

Egcotritt – range of applications:

- Stair landings:
  decouples the whole staircase system
- Building foundations:
  acoustically decoupled transmission of horizontal forces within the component joint between the foundation and the building
- Exterior corridors:
  decouples the complete corridor system and can be used in connection with thermal insulation
- Floors:
  decouples the complete floor in rooms for special purposes, e.g. in theatres

Egcotritt O-A for in-situ concrete construction, with modified anchor body

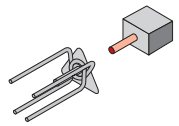
The acoustic decoupling system with 32 dB impact sound reduction

	Art. no.	Type	Joint thickness mm	Weight kg/pce.
	EDKOKF	Egcotritt O-A	0 – 60	3.10
	EDKOGF	Egcotritt O-A	61 – 100	3.37
	EDKOGFHL*	Egcotritt O-A for high loads	61 – 100	8.40
	EDKOKFPM	Egcotritt O-A±	0 – 60	3.76
	EDKOGFPM	Egcotritt O-A±	61 – 100	4.03

* with 25 dB impact sound reduction

Egcotritt F-A for pre-cast component construction, with modified anchor body

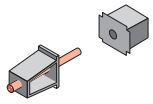
The acoustic decoupling system with 32 dB impact sound reduction

	Art. no.	Type	Joint thickness mm	Weight kg/pce.
	EDKFKF	Egcotritt F-A	0 – 60	3.30
	EDKFGF	Egcotritt F-A	61 – 100	3.57
	EDKFGFHL*	Egcotritt F-A for high loads	61 – 100	9.00
	EDKFKFPM	Egcotritt F-A±	0 – 60	3.96
	EDKFGFPM	Egcotritt F-A±	61 – 100	4.23

* with 25 dB impact sound reduction

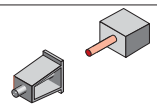
Egcotritt O for in-situ concrete construction

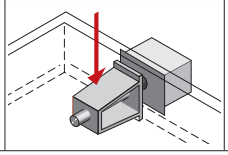
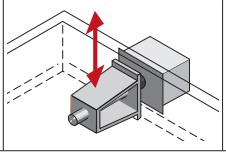
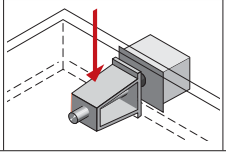
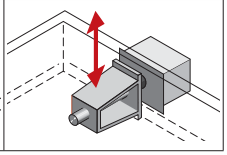
The acoustic decoupling system with 32 dB impact sound reduction

	Art. no.	Type	Joint thickness mm	Weight kg/pce.
	EDKO0006000	Egcotritt O	0 – 60	5.36
	EDKO6110000	Egcotritt O	61 – 100	5.63
	EDKOPM00060	Egcotritt O±	0 – 60	5.86
	EDKOPM61100	Egcotritt O±	61 – 100	6.13

Egcotritt F for pre-cast component construction

The acoustic decoupling system with 32 dB impact sound reduction

	Art. no.	Type	Joint thickness mm	Weight kg/pce.
	EDKF0006000	Egcotritt F	0 – 60	5.51
	EDKF6110000	Egcotritt F	61 – 100	5.78
	EDKFPM00060	Egcotritt F±	0 – 60	6.60
	EDKFPM61100	Egcotritt F±	61 – 100	6.87

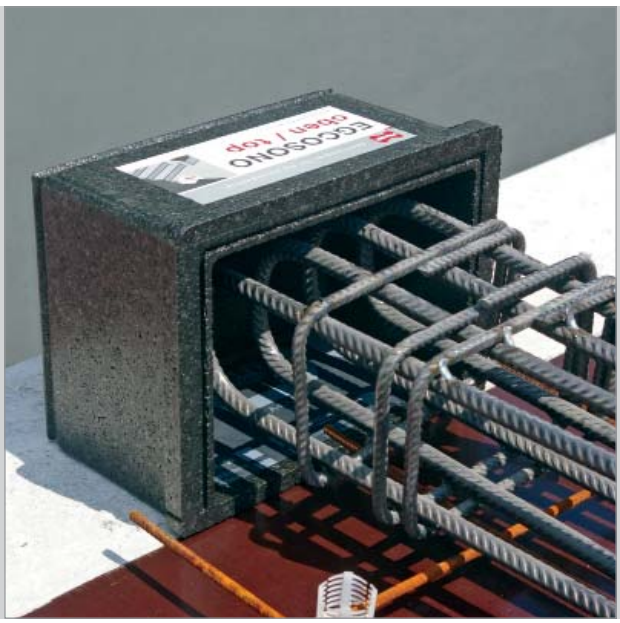
	Stair landings made of in-situ concrete		Precast stair landings	
Type	Egcotritt O	Egcotritt O±	Egcotritt F	Egcotritt F±
Load direction ↕				

For fire protection requirements of up to F120, use our fire protection sleeve on page 88.

Egcosono stair landing bearing

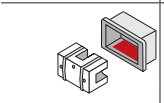
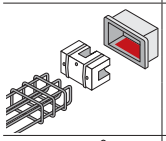
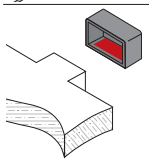
Egcosono acoustic decoupling system protects against undesirable impact sound transmissions in staircases by the acoustic decoupling of stair landings.
The required reinforcement cage can be installed later.

- Impact sound reduction of up to 27 dB
- Fire resistance class to R90
- Type statics
- Load bearing capacity V_{RD} = up to 76 kN
- Suitable for use in-situ and precast concrete construction



	Stair landings made of in-situ concrete				Precast stair landings		
Type	**Egcosono O**	**Egcosono V± O**	**Egcosono H± O**	**Egcosono L O**	**Egcosono F**	**Egcosono V± F**	**Egcosono H± F**
Load direction ↕							
max. load V_{Rd} [kN] ▼	76.4	76.4/-14.5	76.4/-14.5	152.8	76.4	76.4/-14.5	76.4/-14.5
max. horizontal load H_{Rd} [kN] ▶	–	–	± 36.2	–	–	–	± 36.2
Stair landing thickness	≥ 160 mm				160/180/200 mm		

Egcosono stair landing bearing

	Designation	Art. no.	Type	Height h mm	Width mm	Depth mm	Weight kg/pce.
	In-situ concrete construction with assembly element	ESON01F	Egcosono O	160	224	136	0.60
		ESON01V	Egcosono V±O	160	224	136	0.60
		ESON01H	Egcosono H±O	160	224	136	0.60
		ESON01L	Egcosono LO	160	445	136	0.60
	In-situ concrete construction with assembly element and reinforcement cage	ESON0OB	Egcosono OB	160	224	136	5.90
		ESON0VB	Egcosono V±B	160	224	136	5.90
		ESON0HB	Egcosono H±B	160	224	136	5.90
		ESON0LOB	Egcosono LOB	160	445	136	11.20
	Pre-cast construction	ESON02F160	Egcosono F	160	252	145	0.50
		ESON02F180	Egcosono F	180	252	145	0.50
		ESON02F200	Egcosono F	200	252	145	0.50
		ESON02V160	Egcosono V±F	160	252	145	0.50
		ESON02V180	Egcosono V±F	180	252	145	0.50
		ESON02V200	Egcosono V±F	200	252	145	0.50
		ESON02H160	Egcosono H±F	160	252	145	0.50
		ESON02H180	Egcosono H±F	180	252	145	0.50
		ESON02H200	Egcosono H±F	200	252	145	0.50

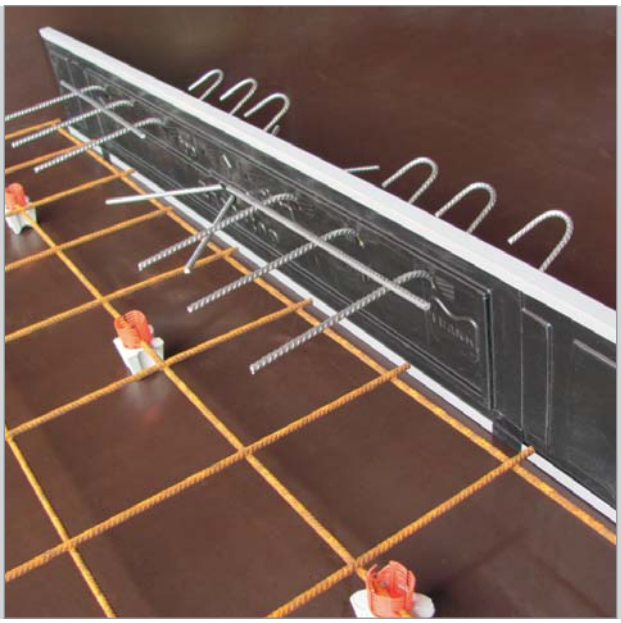
All dimensions are inside dimensions.

More detailed technical information and design values can be found in our brochure “Building Acoustics”.

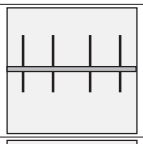
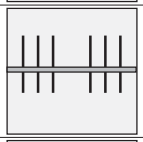
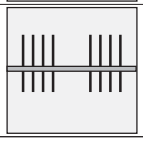
Egcostep acoustic stair decoupling system

Egcostep acoustically decouples the stair flight from the stair landing and reduces impact sound transmission in the staircase.

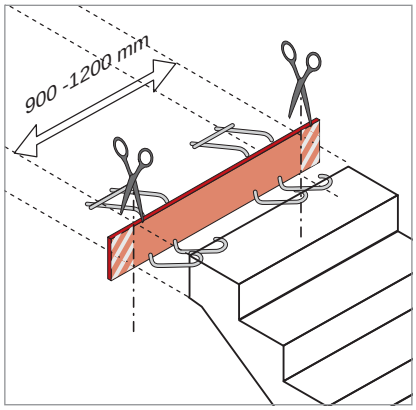
- A 14 dB reduction in impact sound transmission
- Fire resistance class to R90
- Type statics
- In-situ-/ Pre-cast stair flight
- Special lengths of up to 1.7 m available

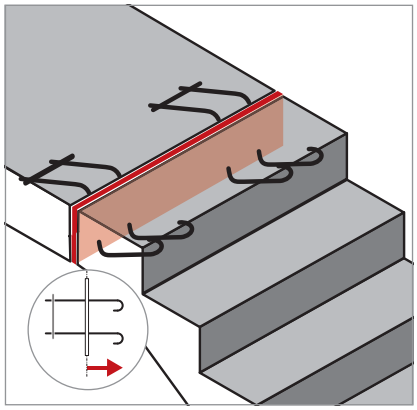


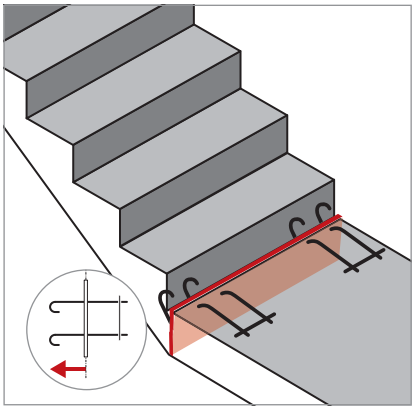
Egcostep acoustic stair decoupling system

	Art. no.	Type	Length mm	Stair landing thickness mm	Weight kg/pce.	Pieces/pallet
	ESTEPS4160	Egcostep S4	1200	160	1,90	16
	ESTEPS4180	Egcostep S4	1200	180	2,02	16
	ESTEPS4200	Egcostep S4	1200	200	2,14	16
	ESTEPS4220	Egcostep S4	1200	220	2,27	16
	ESTEPS4250	Egcostep S4	1200	250	2,40	16
	ESTEPS6160	Egcostep S6	1200	160	2,17	16
	ESTEPS6180	Egcostep S6	1200	180	2,30	16
	ESTEPS6200	Egcostep S6	1200	200	2,42	16
	ESTEPS6220	Egcostep S6	1200	220	2,55	16
	ESTEPS6250	Egcostep S6	1200	250	2,68	16
	ESTEPS8160	Egcostep S8	1200	160	2,45	16
	ESTEPS8180	Egcostep S8	1200	180	2,58	16
	ESTEPS8200	Egcostep S8	1200	200	2,70	16
	ESTEPS8220	Egcostep S8	1200	220	2,83	16
	ESTEPS8250	Egcostep S8	1200	250	2,96	16

Egcostep can be individually cut to the desired length up to 900 mm.
Long elements from 1.20 to 1.70 m, e.g. ESEP6180L plus specification of the exact element length.





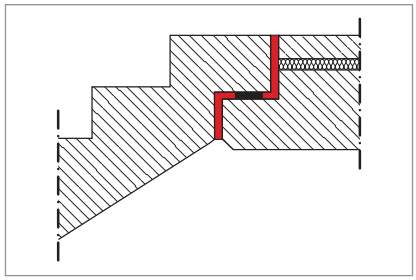


Egcoscal stair bedding – S-shape

for the acoustic decoupling of components, can be formed, special lengths available

Art. no.	Type	Permissible load V_d kN/element	Length mm	Thickness mm	Weight kg/pce.
LATLS100-33	S100-33	33	1000	10	0.21
LATLS120-44	S120-44	44	1200	10	0.26
LATLS150-55	S150-55	55	1500	10	0.32
LATLS100-66	S100-66	66	1000	10	0.31
LATLS120-78	S120-78	78	1200	10	0.36
LATLS150-100	S150-100	100	1500	10	0.45

Other dimensions, e.g. L-shape and permissible loads on request.



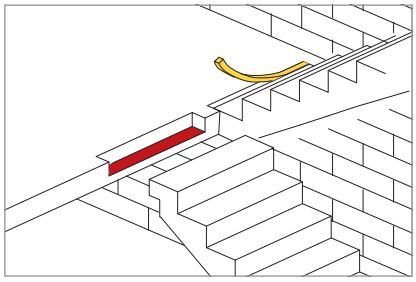
Reduction in impact sound transmission ΔL_W up to 31 dB*

* tested according to ISO 717-2
Test report issued by the SG institute for Approval of Sound Insulation of Building Products

Egcoscal T

Stair bedding for staircases made of pre-cast components

Art. no.	Length mm	Width mm	Thickness mm
LATLTR	10000	100	10
LATLT120	1200	100	10
LATLT100	1000	100	10
LATLTSONDER	on request	100	10



- Strip bearings made of a special type of Elastomer, which was specifically developed for this application
- Considerable reduction in impact sound transmission of up to 32 dB
- Dimensions: thickness 10 mm, width 100 mm, supplied on the roll or cut to size

Egcoscal tape

Optimum impact sound insulation can only be achieved if sound bridges are completely excluded.
Even “minor sound bridges” of some millimetres are likely to reduce impact sound insulation by up to 12 dB.
The adhesive tape Egcoscal prevents soiling of the joints and at the same time minimizes the risk of new sound bridges.

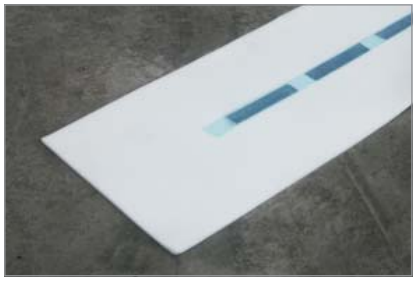
Art. no.	Length mm	Width mm	Thickness mm
LATLTF2030	2000	30	20

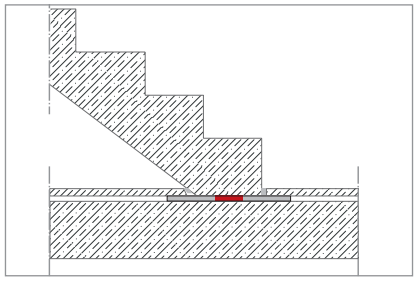
Egcoscal stair bedding – F-shape

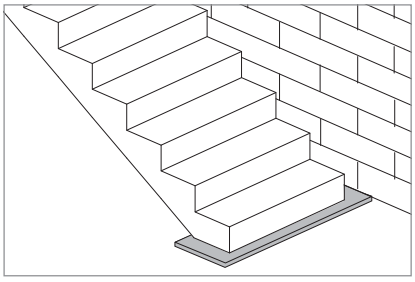
for the acoustic decoupling of components, can be formed, special lengths available

Art. no.	Permissible load V_d kN/element	Dimensions mm	Weight kg/pce.
LATLF159	max. 54	1590 x 500 x 10	0.50

Other sizes on request.



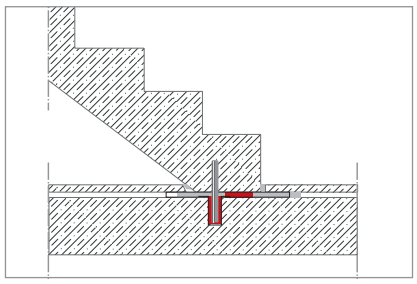


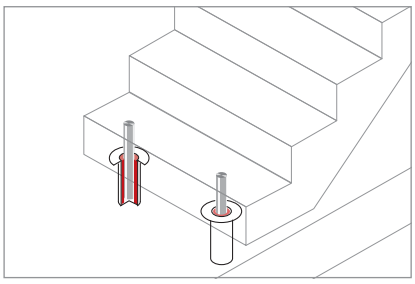


Egcoscal dowel system for structural securing of stairs

For acoustic decoupling between stair landing and base slab with simultaneous structural securing.

Art. no.	Designation	Dimensions mm	Weight kg/pce.
LATLTD22	Stair locating dowel made of stainless steel	Ø 22 x 300	0.93





Distance plate FDPL

Art. no.	Dimensions mm
FDPL15355	1000 x 355 x 15

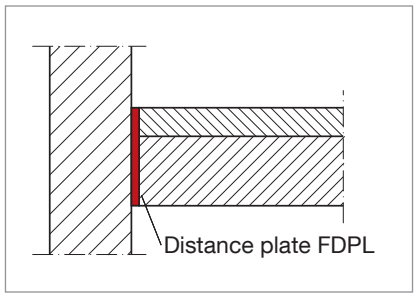
Special adhesive tape

for distance plate FDPL

Designation	Art. no.	Roll length m	Thickness mm	Width mm
Double sided adhesive tape for fixing FDPL distance plate	FDPLKB	50	0.5	50

Spacer plate FDPL in set

Designation	Art. no.
Spacer plates set, 15 spacer plates FDPL, incl. already applied, double faced adhesive tape and cutter knife	FDPLSET



Optimum impact sound insulation can only be achieved if sound bridges are completely excluded.
Using the FRANK distance plate you seal the joints and protect them from soiling, e.g. for joints between stair flight and landing.

- Density: 30 ± 4 kg/m^3
- Fire protection: Building materials class B2 to DIN 4102

Egcodist wall and floor bearings

Improve the quality of your buildings!

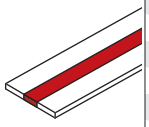
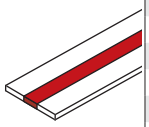
Take advantage of the wall and floor bearings and avoid possible structural damage during the planning and/or shell construction phase.

Product features:

- Load centring
- Compensation for changes in length
- Compensation for irregularities
- Reduction of secondary sound sources
- Fire protection

Egcodist C

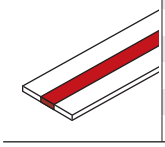
Centring bearing

	Art. no.	Bearing thickness mm	Bearing width mm	Core strip width mm	Permissible line load kN/m	Design value line load kN/m	Permissible horizontal movement mm	Weight kg/m
	EDISTC10115100	10	115	40	100	143.00	± 4.8	0.42
	EDISTC10175100	10	175	40	100	143.00	± 4.8	0.44
	EDISTC10240100	10	240	40	100	143.00	± 4.8	0.46
	EDISTC10115150	10	115	50	150	214.50	± 4.8	0.52
	EDISTC10175150	10	175	50	150	214.50	± 4.8	0.54
	EDISTC10240150	10	240	50	150	214.50	± 4.8	0.56
	EDISTC05115075	5	115	25	75	107.25	± 2.0	0.14
	EDISTC05175075	5	175	25	75	107.25	± 2.0	0.15
	EDISTC05240075	5	240	25	75	107.25	± 2.0	0.16
	EDISTC05115150	5	115	50	150	214.50	± 2.0	0.27
	EDISTC05175150	5	175	50	150	214.50	± 2.0	0.28
	EDISTC05240150	5	240	50	150	214.50	± 2.0	0.30

Standard length 1.00 m. Special widths available on request.

Egcodist C R90

Centring bearing

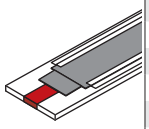
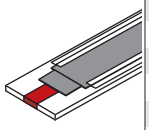
	Art. no.	Bearing thickness mm	Bearing width mm	Core strip width mm	Permissible line load kN/m	Design value line load kN/m	Permissible horizontal movement mm	Weight kg/m
	EDISTC1050115R90	10	115	50	100	143.00	± 4.8	0.67
	EDISTC1050175R90	10	175	50	100	143.00	± 4.8	0.79
	EDISTC1050240R90	10	240	50	100	143.00	± 4.8	0.92
	EDISTC1060115R90	10	115	60	150	214.50	± 4.8	0.75
	EDISTC1060175R90	10	175	60	150	214.50	± 4.8	0.88
	EDISTC1060240R90	10	240	60	150	214.50	± 4.8	1.00

Standard length 1.20 m. Special widths available on request.

- Centring bearing, laid on smooth mortar, ensures centering of load
- Absorption of angular displacements
- Absorption of horizontal movement by deformation of the centre strip

Egcodist CG

Centring bearing with permanent sliding function

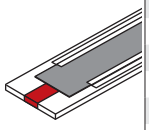
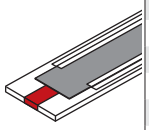
	Art. no.	Bearing thickness mm	Bearing width mm	Core strip width mm	Permissible line load kN/m	Design value line load kN/m	Permissible horizontal movement mm	Weight kg/m
	EDISTCG10115100	10	115	40	100	143.00	± 13.0	0.51
	EDISTCG10175100	10	175	40	100	143.00	± 13.0	0.53
	EDISTCG10240100	10	240	40	100	143.00	± 13.0	0.55
	EDISTCG10115150	10	115	50	150	214.50	± 16.0	0.61
	EDISTCG10175150	10	175	50	150	214.50	± 16.0	0.62
	EDISTCG10240150	10	240	50	150	214.50	± 16.0	0.63
	EDISTCG05115075	5	115	25	75	107.25	± 8.0	0.23
	EDISTCG05175075	5	175	25	75	107.25	± 8.0	0.24
	EDISTCG05240075	5	240	25	75	107.25	± 8.0	0.25
	EDISTCG05115150	5	115	50	150	214.50	± 16.0	0.36
	EDISTCG05175150	5	175	50	150	214.50	± 16.0	0.37
	EDISTCG05240150	5	240	50	150	214.50	± 16.0	0.38

Standard length 1.00 m. Special widths available on request.

- Pilot / slide bearing laid on smooth mortar / ring beam
- Permanent absorption of horizontal movement for reasons such as temperature differences between inside and out
- Absorption of angular displacements

Egcodist CT

Centring bearing with temporary sliding function

	Art. no.	Bearing thickness mm	Bearing width mm	Core strip width mm	Permissible line load kN/m	Design value line load kN/m	Permissible horizontal movement initial displacement mm	Permissible horizontal movement permanent displacement mm	Weight kg/m
	EDISTCT10115100	10	115	40	100	143.00	± 13.0	± 4.8	0.47
	EDISTCT10175100	10	175	40	100	143.00	± 13.0	± 4.8	0.49
	EDISTCT10240100	10	240	40	100	143.00	± 13.0	± 4.8	0.51
	EDISTCT10115150	10	115	50	150	214.50	± 16.0	± 4.8	0.57
	EDISTCT10175150	10	175	50	150	214.50	± 16.0	± 4.8	0.58
	EDISTCT10240150	10	240	50	150	214.50	± 16.0	± 4.8	0.59
	EDISTCT05115075	5	115	25	75	107.25	± 8.0	± 2.0	0.19
	EDISTCT05175075	5	175	25	75	107.25	± 8.0	± 2.0	0.20
	EDISTCT05240075	5	240	25	75	107.25	± 8.0	± 2.0	0.21
	EDISTCT05115150	5	115	50	150	214.50	± 16.0	± 2.0	0.32
	EDISTCT05175150	5	175	50	150	214.50	± 16.0	± 2.0	0.33
	EDISTCT05240150	5	240	50	150	214.50	± 16.0	± 2.0	0.34

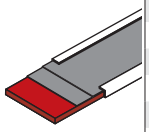
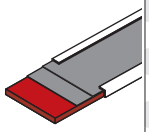
Standard length 1.00 m. Special widths available on request.

- Pilot / slide bearing laid on smooth mortar / ring beam
- Temporary absorption of horizontal movements for reasons such as temperature differences between inside and out
- Absorption of angular displacements

More information about Egcodist wall and floor bearings can be found in our brochure at www.maxfrank.com

Egcodist G

Flat support with permanent sliding function

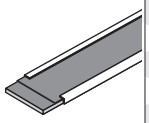
	Art. no.	Bearing thickness mm	Bearing width mm	Permissible compressive stress N/mm²	Design value compressive stress N/mm²	Weight kg/m
	EDISTG10115	11	115	≤ 3.5	≤ 5.0	1.19
	EDISTG10175	11	175	≤ 3.5	≤ 5.0	1.79
	EDISTG10240	11	240	≤ 3.5	≤ 5.0	2.45
	EDISTG05115	6	115	≤ 3.5	≤ 5.0	0.63
	EDISTG05175	6	175	≤ 3.5	≤ 5.0	0.95
	EDISTG05240	6	240	≤ 3.5	≤ 5.0	1.30

Standard length 1.00 m. Special widths available on request.

- Slide bearings laid on smooth mortar/ring beam
- Permanent absorption of horizontal movement

Egcodist GP

Flat support with permanent sliding function

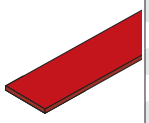
	Art. no.	Bearing thickness mm	Bearing width mm	Permissible compressive stress N/mm²	Design value compressive stress N/mm²	Weight kg/m
	EDISTGP115	2	115	≤ 3.5	≤ 5.0	0.08
	EDISTGP175	2	175	≤ 3.5	≤ 5.0	0.14
	EDISTGP240	2	240	≤ 3.5	≤ 5.0	0.17

Standard length 1.00 m. Special widths available on request.

- Slide bearings on very smooth concrete surfaces
- Permanent absorption of horizontal movement for reasons such as temperature differences between inside and outside.

Egcodist S

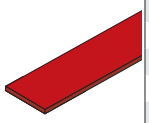
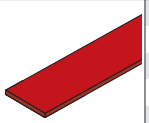
Elastomer bearing

	Art. no.	Bearing thickness mm	Bearing width mm	Permissible compressive stress N/mm²	Design value compressive stress N/mm²	Weight kg/pce.
	EDISTS10125	10	125	≤ 3.5	≤ 5.0	1.28
	EDISTS10180	10	180	≤ 3.5	≤ 5.0	1.84
	EDISTS10250	10	250	≤ 3.5	≤ 5.0	2.55

Standard length 1.00 m. Special widths available on request.

Egcodist S

Elastomer bearing

	Art. no.	Bearing thickness mm	Bearing width mm	Permissible compressive stress N/mm²	Design value compressive stress N/mm²	Weight kg/roll
	EDISTS05125	5	125	≤ 3.5	≤ 5.0	6.22
	EDISTS05180	5	180	≤ 3.5	≤ 5.0	8.96
	EDISTS05250	5	250	≤ 3.5	≤ 5.0	12.44
	EDISTS03125	3	125	≤ 3.5	≤ 5.0	3.73
	EDISTS03180	3	180	≤ 3.5	≤ 5.0	5.39
	EDISTS03250	3	250	≤ 3.5	≤ 5.0	7.47

Roller length 9.75 m. Special widths available on request.

- Transmission of area loads
- Impact sound insulation for reduction of secondary paths of sound waves

Egcovoid former for creating voids under base slabs/pile caps, as separating layer/lost formwork.

Areas of application:

- Separation from expansive clay soils
- Gap for expanding sealing material
- Optimum load distribution for cast-in-situ piles
- In below-ground locations, excessive loads on surfaces caused by concrete slabs are avoided
- Smooth lost formwork as a separation layer between the structure and retaining shutters
- Vertical separation from existing foundations

Egcovoid former

Designation	Art. no.	Length mm	Width mm	Thickness mm	Weight kg/m²
Egcovoid former with moisture protection, without hose system	EVSPL035FS	2400	1200	35	2.15
	EVSPL050FS	2400	1200	50	2.65
Egcovoid former with moisture protection and hose system	EVSPL035KW	2400	1200	35	2.25
	EVSPL050KW	2400	1200	50	2.75

Special designs on request.

Hose

for connection of void formers

Art. no.	Length m	Diameter inch	Weight kg/m
YFXPSETZS	50.00	0.50	0.19

Sealing and repair tape

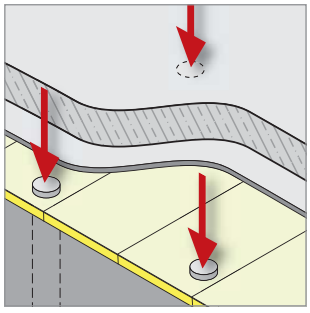
for void formers

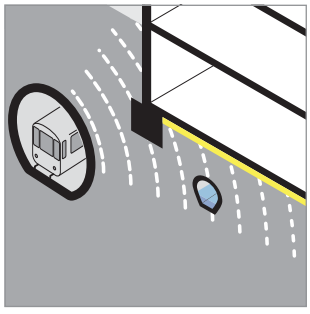
Art. no.	Dimensions	Weight kg/roll
EVKB120	120 mm x 33 m	0.77

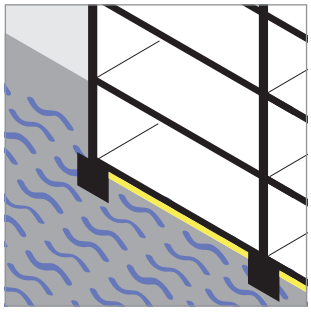
Accessories for Egcovoid

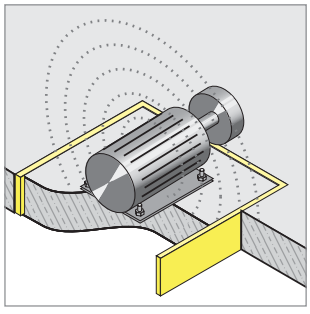
Art. no.	Designation	Weight kg/pce.
FXVENTILT	Valve piece T-shape connection hose/void former	0.01
FXVENTILL	Valve piece L-shape connection hose/void former	0.01
FXKUPPLU	Hose coupling/claw coupling 1/2“	0.09

Examples of use









More information, as well as the installation instructions for Egcovoid can be found at www.maxfrank.com

§ 1 General – scope

(1) Our Conditions of Sale apply exclusively to the legal relations between Max Frank GmbH & Co. KG and the Buyer. We shall not recognise the Buyer's conditions to the contrary or such that vary from our Conditions of Sale unless we expressly approved of their validity in writing. Our Conditions of Sale shall also apply if we deliver to the Buyer without reservation although we are aware of the Buyer's conditions to the contrary or those that vary from our Conditions of Sale.
(2) Agreements or subsidiary agreements that vary from these conditions shall only be deemed valid if confirmed in writing by us.
(3) Our Conditions of Sale also apply to all future transactions entered into with the Buyer.
(4) Our Conditions of Sale only apply to companies within the meaning of Section 310, sub-section 1, German Civil Code (BGB).

§ 2 Offer – offer documents

(1) Our offers are subject to confirmation.
(2) A delivery contract shall only come into being following written confirmation of order by us, at the latest upon delivery. Forwarding per data communication is deemed sufficient in respect of the written form.
(3) If the order is to be qualified as an offer pursuant to Section 145 BGB, we may accept it within two weeks.
(4) We reserve the proprietary rights and copyrights to drawings, calculations and other documents. This also applies to written documents that are described as "confidential". The Buyer is to obtain our express, written, approval prior to forwarding such documents to third parties.

§ 3 Receipt of letters of intent

If we can furnish proof by presenting a telephone invoice and a fax journal, that we have sent the letter of intent per facsimile or data communication, it shall be assumed that the Buyer has received such a letter of intent.

§ 4 Prices – terms of payment

(1) Only the prices we confirm in writing are deemed valid. These are to be construed ex works plus the statutory value added tax, postage, packaging, freight and insurance etc. A € 10.00 surcharge shall apply in the case of small orders valued at less than € 50.00.
(2) We reserve the right to amend our prices accordingly if, once the contract is entered into, cost reductions or increases apply in particular due to increases in wage costs or material price changes. On request we shall provide the Buyer with proof in this respect.
(3) Our invoices shall fall due within 10 days subject to 2% trade discount, or within 30 days without deductions.
(4) Means of payment other than cash, bank transfer or presenting a cheque shall be subject to a special agreement. Receipt at our company shall be deemed authoritative in respect of timely payment.
(5) The statutory regulations regarding the consequences of default in payment are deemed applicable.
(6) The Buyer may only set off using counterclaims that we recognise or such that have become res judicata. The Buyer shall only be entitled to exercise a right of retention insofar as its counterclaim refers to the same contractual relationship.
(7) If once the contract has been entered into we become aware of circumstances that call into question the Buyer's creditworthiness, or if our claim for payment is considerably jeopardised due to a dwindling of the Buyer's assets, or if the Buyer defaults in respect of paying the purchase price, we may demand an advance payment or a security within a reasonable period and refuse performance until our demand has been met. If the Buyer refuses to comply, or in the event that the period expires in vain, we shall be entitled to withdraw from the contract either in full or in part and claim damages in lieu of performance

§ 5 Product adjustments

We reserve the right in any case to carry out construction, form and technical improvements in line with the respective engineering standards up until delivery.

§ 6 Deliveries, delivery time, default in delivery

(1) The start of the delivery and performance dates stated by us are conditional on the fact that all technical matters have been clarified and the Buyer's obligations are honoured in good time and in a proper manner. If this is not the case, the deadline shall be extended accordingly. The parties reserve the right to object to a contract that is not executed.
(2) The delivery period shall be extended in the case of force majeure, strikes or delays that are not our responsibility for the duration of the obstruction.
(3) We are entitled to provide partial deliveries insofar as this does not result in disadvantages in respect of use. Delivery quantities that either exceed or fall short of the agreed quantity by 10% shall be deemed proper execution of the contract.
(4) If the Buyer defaults in acceptance or culpably violates other collaboration duties, we shall be entitled to give preference to other third party orders and extend the delivery time accordingly. Irrespective of further claims, we shall be entitled insofar to demand compensation for the damage we suffer, including additional expenses that may apply. Irrespective of more far-reaching rights, we may, in particular, charge for each month storage fees of 0.5%, at most however 5% of the price of the delayed delivery.
(5) Insofar as the conditions of sub-section (4) apply, the risk of possible loss or possible deterioration of the purchased item shall pass to the Buyer at the time at which the Buyer defaults in acceptance or defaults as the debtor.
(6) In the case of blanket orders we may charge storage fees of 0.5% of the price of the delayed delivery. Furthermore, in the case of blanket orders we may, once 12 months have lapsed following confirmation of an order, set a one-month subsequent period for acceptance and subsequently invoice the goods or performance that have not been accepted or charge fees for keeping goods or services available.
(7) We shall be liable in accordance with the statutory provisions insofar as the delivery delay is attributable to wilful or gross negligent breach of contract for which we are responsible. Culpability on the part of our representatives or vicarious agents is to be attributed to us. In the event of a grossly negligent breach of contract, our liability for damages shall be limited to foreseeable and typical cases of damage. An alteration to the burden of proof to the Buyer's detriment is not associated with this regulation.
(8) We shall be liable in accordance with the statutory provisions insofar as the delivery delay for which we are responsible is based on a culpable violation of a key contractual obligation. However, in such a case the liability for damages shall be limited to foreseeable and typical cases of damage unless we or our vicarious agents are accused of intent or gross negligence.
(9) Insofar as default in delivery is our responsibility in accordance with these provisions, our liability for each full week of delay shall be limited to compensation of 0.5%, at most however totalling 5%, of the price for the part of delivery that cannot be used due to the delay.
(10) The Buyer undertakes at our request to state within a reasonable period whether, in view of the default in delivery, it will withdraw from the contract or insists on the delivery.
(11) Other statutory claims and rights to which the Buyer is entitled in the event of default are reserved.

§ 7 Passing of risk – cost of packaging

(1) Insofar as nothing to the contrary is specified in the confirmation of order, deliveries are agreed upon as "ex works/warehouse". We shall at our discretion specify the shipping type and route. Goods shall be shipped at the Buyer's risk and for its account. This also applies to returns.
(2) Transport and all other one-way packaging shall not be taken back.
(3) Small and punched parts shall be delivered as bulk. Single item or special packaging shall only be used following an appropriate agreement.
(4) At the Buyer's request we shall take out transport insurance coverage for the delivery. Costs incurred in this respect shall be borne by the Buyer.
(5) In the case of deliveries abroad, the Buyer shall carry all costs associated with the transport ex works. This means we will have executed the contract of purchase following hand-over of the goods to the shipping agent – all additional costs and risks (customs duties, freight, loss, damage) shall pass to the Buyer (EXW clause of the International Commercial Terms – Incoterms).

§ 8 Rights in respect of defects and liability

(1) Customary variations in the case of deliveries from various manufacturing series are not deemed defects. The same applies in the case of generally acceptable variations in deliveries of samples and specimens. Technical data, specifications and performance data in offers, contracts, Annexes, advertising brochures and documents etc. merely describe the quality of products and do not constitute any guarantees unless they are described as such.
(2) Notification of defects must be given in writing and without delay, at the latest within a period of 8 days. In the case of obvious defects, the period shall commence upon delivery, while in the case of hidden defects once such defects are discovered. The delivery shall be deemed accepted if the Buyer fails to provide notification.
(3) Insofar as the purchased item contains a defect, we shall be entitled at our discretion to provide subsequent performance in the form of rectification of defects or replacement delivery of a new, defect-free, item. In the case of rectifying defects we undertake to carry all expenses required to rectify the defects, in particular the cost of transport, travelling, work and materials insofar as these do not increase because the purchased item has been taken to a location other than place of performance. We may reject providing subsequent performance if it is only associated with unacceptably high or disproportionately high costs.
(4) If the subsequent performance fails, the Buyer shall – irrespective of claims for damages that may apply – at its discretion be entitled to withdraw from the contract (rescission of contract) or to a price reduction (reduce the remuneration).
(5) Warranty claims shall not apply in the case of a merely an insignificant deviation from the agreed quality or the agreed delivery quantity, in the case of merely inconsiderable impairment in respect of use, in the case of natural wear-and-tear or damage caused once the risk has passed due to faulty or negligent handling, excessive stress, unsuitable operating material, inappropriate use, improper use, faulty assembly, failure to observe maintenance and operating instructions or due to particular external influences that are not assumed in the contract. A deviation in delivery quantity of up to 10% is deemed insignificant. If the Buyer or third parties make improper alterations, these and the subsequent consequences shall not be subject to warranty claims.
(6) In any case we may render the subsequent performance (subsequent improvement or replacement delivery) conditional on whether an appropriate part of the agreed remuneration has already been paid that is proportionate to the scope and severity of the defect.
(7) The Buyer shall support us in identifying and remedying defects, provide us with comprehensive information and consult us. It is to give us the opportunity to review the case of damage.
(8) We shall be liable in accordance with the statutory provisions insofar as the Buyer asserts claims for damages that are based on intent, gross

negligence, including intent or gross negligence on the part of our representatives or vicarious agents. Insofar as we are not accused of intentional breach of contract, liability for damages shall be limited to foreseeable and typical cases of damage.

(9) We shall be liable in accordance with the statutory provisions insofar as we culpably violate a key contractual obligation. However, in such a case the liability for damages shall be limited to foreseeable and typical cases of damage unless we or our vicarious agents are accused of intent or gross negligence.

(10) Insofar as the Buyer is entitled to compensation for damage in lieu of performance, our liability shall be limited to compensation of foreseeable and typical cases of damage.

(11) This shall not affect the liability due to culpable damage resulting from injury to life, body or health. This also applies to the mandatory liability in accordance with the German Product Liability Act.

(12) An alteration to the burden of proof to the Buyer's detriment is not associated with this regulation.

(13) In the absence of agreements to the contrary, the period of limitation in respect of warranty claims in the case of items that were used for a structure in accordance with customary usage, and that are responsible for faults in the structure, is 36 months from the passing of risk. In the case of other items the period of limitation is 12 months. This shall not affect the period of limitation in the case of delivery recourse pursuant to Sections 478 and 479 BGB. In other respects the statutory period of limitation shall apply to cases of damage resulting from injury to life, body or health, intentional or grossly negligent violation of an obligation and in the case of fraudulent concealment of a defect. These provisions shall not affect the statutory regulations on the start of the limitation and the suspension, hindrance and new start of the periods.

(14) The Buyer shall only be entitled to recourse against us pursuant to Section 478 BGB (recourse on the part of the businessman) insofar as the Buyer has not entered into any agreements with its customer that extend above and beyond the statutory warranty claims. These regulations apply accordingly to the scope of our liability for damages.

§ 9 Industrial proprietary rights, defect in title

(1) The Buyer undertakes to inform us without delay of third-party claim to proprietary rights in respect of the supplied products and to leave any legal defence to us at our expense.

(2) We are entitled to implement modifications at our own cost in the case of third-party claims to proprietary rights, even in the case of supplied and paid goods.

(3) The Buyer's claims shall be excluded insofar as it is responsible for the violation of proprietary rights. The Buyer's claims shall be further excluded insofar as the violation of proprietary rights is caused by the Buyer's special requirements, by an application that we could not foresee or because the Buyer's delivery is modified or used in conjunction with products that we have not delivered.

§ 10 Overall liability

(1) Liability for compensatory damages that exceeds that provided for in Sections 8 and 9 is excluded – without consideration to the legal nature of the asserted claim. This applies, in particular, to claims for damages from culpability in the case of entering into a contract, other violations of obligations or due to tortious claims in respect of compensation of material damage pursuant to Section 823 BGB.

(2) The demarcation according to sub-section (1) also applies insofar as the Customer demands compensation of useless expenses instead of the performance in lieu of a claim for compensatory damages.

(3) Insofar as liability for damages is excluded or limited in dealings with us, this shall also apply in respect of the personal liability for damage of our salaried staff, workers, employees, representatives and vicarious agents.

§ 11 Customised products, cost of tools

(1) In the case of delivering customised products we shall charge proportionate and one-off costs in respect of manufacturing appropriate tools.

(2) The tools shall remain our property. The Buyer may demand that such tools may only be used for orders it has placed. In other respects we reserve the right without restrictions to all copyrights and ancillary copyrights to the tools.

(3) If customised products contain defects, the Buyer shall initially be entitled to assert a claim for subsequent performance. If the Buyer demands subsequent performance, we may at our discretion rectify the defect or manufacture a new item. If the subsequent performance fails, the Buyer shall – irrespective of claims for damages that may apply – be entitled at its discretion to withdraw from the contract (rescission of the contract) or to a price reduction (reduction of remuneration). In other respects the provisions of Sections 8 to 10 apply mutatis mutandis to the abatement and our liability.

§ 12 Reservation of title

(1) We reserve the right to ownership of the purchased item up until receipt of all payments resulting from the business association (including all balance claims from the current account) entered into with the Buyer. If the value of the items surrendered to us as a security and which are subject to the reservation of title exceed our total claim by more than 20%, we shall, at the Buyer's request, be under obligation to (proportionately) release the security.

(2) In the case of breach of contract on the part of the Buyer, in particular in the case of default in payment, we shall be entitled to take back the purchased item after setting a reasonable period. Taking back the purchased item shall constitute withdrawal from the contract on our part. After having taken back the purchased item, we shall be entitled to sell it. The proceeds from the sale are to be counted towards the Buyer's liabilities – less appropriate utilisation costs.

(3) The Buyer may neither pledge nor transfer ownership of the delivery items prior to payment of the purchase price. In the case of seizure and confiscation or other intervention on the part of third parties, the Buyer is to inform us without delay and provide us with all information and documents required to safeguard our rights. Enforcement officers or third parties are to be informed of our property. Insofar as the third party is not in a position to compensate us for court and out-of-court costs in respect of an action pursuant to Section 771 German Code of Civil Procedure (ZPO), the Buyer shall be liable for the loss we suffer.

(4) The Buyer is entitled to sell the delivery items in the ordinary course of business. However, he hereby assigns to us at this point in time all claims in the sum of the purchase price agreed upon between us and the Buyer, including value added tax, due to the Buyer form its customers or third parties as a result of the sale, irrespective of whether the delivery items are sold without or after processing. The Buyer shall is also authorised to collect such a claim after the assignment too. This shall not affect our authority to collect the claim. However, we undertake not to collect the claim as long as the Buyer properly honours its payment obligations and does not default in payment. However, if this is the case, we may demand that the Buyer inform us of the assigned claims and the appertaining debtors, that it provide us with all the necessary details, surrender the pertinent documents and inform the debtors (third parties) of the assignment.

(5) The processing or remodelling of the goods by the Buyer shall at all times be carried out on our behalf. If the delivery items are processed with other items that we do not own, we shall acquire co-ownership in the new item in the proportion of the value of the delivery items to that of the other processed items at the time of processing. In other respects the provisions that apply to the delivery items subject to reservation apply by the same token to the item created by processing.

(6) If delivery items are inseparably linked to other items that we do not own, we shall acquire co-ownership in the new item in the proportion of the value of the delivery items to that of the other linked items at the time of linking. If the mixing is carried out such that the Buyer's item is to be regarded as the principal item, it is deemed agreed that the Buyer shall assign to us proportionate co-ownership. The Buyer shall store the solely owned or co-owned item created thus on our behalf.

(7) The Buyer also assigns to us the claims against a third party for securing our claims against the Buyer that arise on the basis of linking the purchased item to a plot of land.

(8) We undertake at the Buyer's request to release the securities due to us insofar as the realisable value of our securities exceeds by more than 10% the claims that are to be secured. We are free to select the securities that are to be released.

§ 13 Secrecy and data protection

(1) The contracting parties shall treat in confidence all verbal and written information or such of which they otherwise gain knowledge, or such that is described as confidential or which on the basis of its nature is normally to be regarded as confidential, and treat in confidence documents during the period of the contractual relationship and for two years following the end of the contract, solely use such information as part of the services set out in this contract and without approval by the respective other party neither forward it to third parties nor otherwise make it available to third parties, and undertake all precautionary measures to rule out and avoid access thereto by any third party.

(2) This obligation to maintain secrecy does not apply to information and documents that

- are already in the public domain at the time knowledge is gained of it, i.e. is available to any third party without further action,
- are legally made available to a contracting party, following disclosure, by a third party that in this respect is not under any obligation to the other contracting party to maintain secrecy,
- at the request of the authorities or an otherwise entitled third party are to be disclosed to such a party subject to a requirement,
- must be made available to legal or tax advisers of the respective partner for the purpose of consulting.

(3) We undertake as part of our services as per agreement not to violate data protection provisions. We shall place our employees under obligation to adhere to the data protection provisions and place these persons under an obligation to maintain secrecy. Data protection sensitive activities shall be co-ordinated with the Buyer's data protection officer.

§ 14 Place of jurisdiction – place of performance

(1) Our respective registered office is deemed the place of jurisdiction. However, we are entitled to bring an action against the Buyer at the court with jurisdiction for its place of residence too.

(2) The law of the Federal Republic of Germany is deemed applicable to the exclusion of the UN Convention on Contracts for the International Sale of Goods.

(3) Insofar as nothing is specified to the contrary in the confirmation of order, our registered office is deemed the place of performance.

§ 15 Miscellaneous

(1) In the event that individual provisions of the contract are or become invalid, this shall not affect the validity of the other provisions. It is agreed upon that in lieu of the invalid provision a condition should apply that comes closest to the economic purpose intended by the invalid provision.

(2) Amendments and supplementary information are subject to the written form.

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