

# Spacers made of fibre concrete



# Spacers

## made of fibre concrete

Spacers are used to ensure that the concrete cover specified for structures and structural elements made of reinforced concrete is adhered to, both before and during concreting.

### Fibre concrete – the optimum material in combination with in-situ concrete

- High compressive strength, no deformation in heat or cold, the required concrete cover will be accurately retained
- The spacers remain in position during erecting the formwork and concreting
- 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



### You should observe the following when selecting spacers:

- Required concrete cover to DIN 1045, Para. 13.2 – nom c dimension
- Spacer loading due to the weight of the reinforcement and additional loads e.g. during concreting, fixing and erection work
- Diameter and location of the reinforcement - wall/slab
- Type of reinforcement – single bars or mats
- Type of fixing – without tying wire, with tying wire, with steel or synthetic clips
- External influences affecting the concrete, such as pressure, temperature, chemical attack, alternating moisture penetration, fire and corrosion
- Possible imprint left by spacers on the concrete surface – exposed concrete
- Concrete surface finishing – stucco work
- Simple, rapid and economical fixing – use bar spacers if possible

# Spacers

## Extracts from DIN 1045\* for the determination of the concrete cover

### General conditions

All reinforcement bars must be encased in concrete of a sufficient thickness and density in order to ensure bonding, to prevent corrosion and to protect against fire damage.

A nominal concrete cover dimension  $nom\ c$  of 2.0 - 5.0 cm must be adhered to which is dependent on bar diameter and environmental conditions, as can be seen in table 10 below, and may only be decreased in exceptional circumstances in accordance with Para. 13.2.1 or increased in accordance with Para. 13.2.2.

Environmental conditions	Bar diameter $d_1$ mm	Min. dimension for $\geq B25$ min c cm	Nominal dimension for $\geq B25$ nom c cm
Structural elements in closed rooms, e.g. in residential space (including kitchens, bathrooms and utility rooms), office rooms, schools, hospitals, salesrooms – if not covered by the following points. Structural elements which are permanently dry.	up to 12 14,16 20 25 28	1.0 1.5 2.0 2.5 3.0	2.0 2.5 3.0 3.5 4.0
Structural elements to which external air has regular or permanent access, e.g. open halls or garages. Structural elements which are permanently under water or enclosed in subsoil, as far as they are not covered by line 3 or 4 or other reasons. Roofs with a water-tight roofing skin for the side on which the roofing skin is located.	up to 20 25 28	2.0 2.5 3.0	3.0 3.5 4.0
Structural elements in the open air Structural elements in closed rooms with often occurring high air humidity at normal room temperatures, e.g. in commercial kitchens, baths, washing facilities, damp rooms in indoor swimming baths and cattlesheds. Structural elements which are exposed to alternating moisture penetration, e.g. due to frequent, heavy condensation of water or in areas with wet and dry cycles. Structural elements which are exposed to "light" chemical attacks according to DIN 4030.	up to 25 28	2.5 3.0	3.5 4.0
Structural elements which are exposed to especially corrosion-inducing influences on steel or concrete, e.g. due to frequent exposure to corrosive gases or thawing salts (spray or splash areas) or due to "strong" chemical attacks according to DIN 4030 (see also section 13.3).	up to 28	4.0	5.0

### The concrete cover according to table 10 increases:

- If the largest aggregate size is  $> 32$  mm;
- If damage could occur to the concrete that has not hardened sufficiently;
- According to the requirements of ZTV-K 88 6.3.5;
- If there is to be additional finishing e.g. sandblasting or stucco work to the concrete surfaces;
- Due to technical regulations such as DVGW (German Association of Gas and Hydraulic Engineers) regulations worksheet W311 point 10.2.1

### Extracts from the DVGW\*\* regulations

Technical regulations worksheet W311 - water supply - water distribution with requirements on the reinforcement and for selecting spacer raw materials

#### Point 10.2.1 Reinforcement

The reinforcement must be placed in accordance with the authorised reinforcement drawings. When using loose reinforcement a rigid interconnected reinforcement cage which cannot change its position when concrete is poured must be constructed. The upper reinforcement may only be fixed in place using round bar chairs. **Bottom and side reinforcement must be fixed in place using stable spacers made of cement-based materials.** PVC spacers must not be used as they cannot form a bond with the hardened concrete and provoke a water infiltration along the contact surface of spacer and concrete.

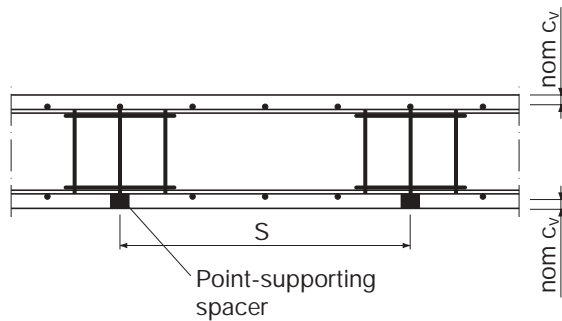
\* Reprinted with permission of the DIN Institute of Standards e.V. The applicable standard is that of the latest publishing date issued by the Beuth Verlag GmbH, Burggrafenstraße 6, Berlin.

\*\* Reprinted with permission of the DVGW (German Association of Gas and Hydraulic Engineers). The applicable worksheet is that of the latest publishing date issued by the Wirtschafts- und Verlagsgesellschaft Gas und Wasser mbH (Gas and Water Economic and Publishing Company Ltd), Postfach 14 01 51, 53056 Bonn.

# Spacers

## Placing and determining number required

Structural element: slabs



Spacer fixing distances

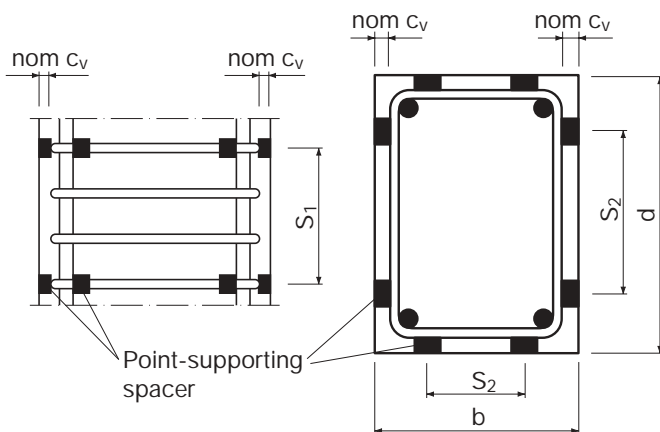
Ø Supporting bars	Required	
	max. S	Pcs. per m <sup>2</sup>
up to 14 mm	50 cm	4
over 14 mm	70 cm	2

**Caution! Thin supporting bars 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.

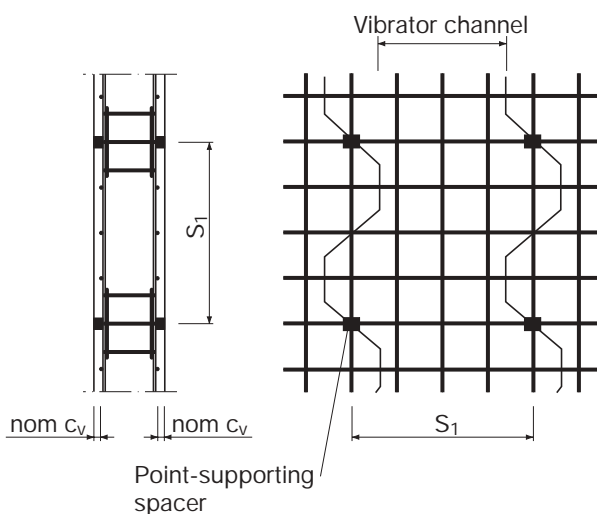
Structural element: beams and columns



Spacer fixing distances

max. S <sub>1</sub> in longitudinal direction		
Ø longitudinal bars	columns	beams
up to 10 mm	50 cm	25 cm
12 to 20 mm	100 cm	50 cm
over 20 mm	125 cm	75 cm
max. S <sub>2</sub> in transverse direction		
b or d	columns	beams
up to 100 cm	2 pcs.	2 pcs.
over 100 cm	≥ 3 pcs.	≥ 3 pcs.
max. S <sub>2</sub>	75 cm	50 cm

Structural element: walls



Spacer fixing distances

Ø Supporting bars	Required	
	max. S <sub>1</sub>	Pcs. per m <sup>2</sup> Wall <sup>1)</sup>
up to 8 mm	70 cm	4
over 10 mm	100 cm	2

<sup>1)</sup> and per wall side

# Spacers without tying wire

## made of fibre concrete for horizontal reinforcement



Spacer type 4013 without tying wire – can be used for horizontal single bar reinforcement or mesh reinforcement

	Article number	Type	Concrete cover mm	Cut width mm	Weight kg/ 1000 pcs.	Sack cont. pcs.	
	AO1501	1501	15	24	27	1000	
	AO2001	2001	20	24	34	1000	
	AO2501	2501	25	24	43	500	
	AO3001	3001	30	24	50	500	
	AO3513	3513	35	28	71	500	
	AO4013	4013	40	28	87	250	
	AO4513	4513	45	28	99	250	
	AO5013	5013	50	28	117	250	
	AO5513	5513	55	28	127	250	
	AO6013	6013	60	28	136	250	
	AO6513	6513	65	28	157	125	
	AO7013	7013	70	28	177	100	
	AO7513	7513	75	28	188	100	
	AO8013	8013	80	28	202	100	
	AO8513	8513	85	28	210	100	
	AO9013	9013	90	28	217	100	
	AO9513	9513	95	28	260	100	
	AO10013	10013	100	28	273	100	
	AO1561	1561	15/20	24	32	1000	
	AO2561	2561	25/30	24	45	500	
	AO3563	3563	35/40	28	79	250	
	AO4063	4063	40/45	28	97	250	
	AO4563	4563	45/55	28	133	250	
	AO5063	5063	50/60	28	140	250	
		AO2071	2071	20/25/30	24	34	1000
		AO3573	3573	35/40/50	28	109	250
AO4573		4573	45/55/60	28	179	125	

Packaging: plastic woven sack, 40 sacks per pallet

# Spacers with tying wire

## made of fibre concrete for horizontal and vertical reinforcement



Spacer type 3572 D – can be used for concrete covers 35/40/50 mm – this allows low stock quantities.

	Article number	Type	Concrete cover mm	Cut width mm	Weight kg/ 1000 pcs.	Sack cont. pcs.
	AD1501	1501 D	15	24	28	1000
	AD2001	2001 D	20	24	35	1000
	AD2501	2501 D	25	24	45	500
	AD3001	3001 D	30	24	52	500
	AD3512	3512 D	35	24	63	500
	AD4013	4013 D	40	28	90	250
	AD4513	4513 D	45	28	102	250
	AD5013	5013 D	50	28	120	250
	AD5513	5513 D	55	28	130	250
	AD6013	6013 D	60	28	139	250
	AD6513	6513 D	65	28	160	125
	AD7013	7013 D	70	28	180	100
	AD7513	7513 D	75	28	191	100
	AD8013	8013 D	80	28	205	100
	AD8513	8513 D	85	28	213	100
	AD9013	9013 D	90	28	220	100
	AD9513	9513 D	95	28	263	100
	AD10013	10013 D	100	28	276	100
	AD1561	1561 D	15/20	24	33	1000
	AD2061	2061 D	20/25	24	36	1000
	AD2561	2561 D	25/30	24	47	500
	AD3562	3562 D	35/40	24	68	250
	AD4062	4062 D	40/45	24	87	250
	AD4562	4562 D	45/55	24	119	250
	AD5062	5062 D	50/60	24	123	250
		AD2071	2071 D	20/25/30	24	35
AD3572		3572 D	35/40/50	26	104	250
AD4573		4573 D	45/55/60	28	178	125
	AG1561	1561 G	15/20	24	26	1000
	AG2071	2071 G	20/25/30	24	34	1000

Version with "galvanised tying wire" on request  
Packaging: plastic woven sack with paper lining, 40 sacks per pallet

With rubber band

# Spacers with steel clips

made of fibre concrete for horizontal and vertical reinforcement



Spacer type Z1K with 2 steel clips guarantees fastest possible fixing and exact, secure seating thanks to the preformed groove.

	Article number	Type	Concrete cover mm	Cut width mm	Weight kg/ 1000 pcs.	Sack cont. pcs.
	AK15H	15 H 1 K	15	20	13	2000
	AK20H	20 H 1 K	20	20	16	1000
	AK25H	25 H 1 K	25	20	23	1000
	AK30H	30 H 1 K	30	20	30	1000
<b>Type "A"</b> 	AK20RA	20 R 1 K	20	20	23	1000
	AK25RA	25 R 1 K	25	20	24	1000
	AK30RA	30 R 1 K	30	20	29	1000
	AK35RA	35 R 1 K	35	20	35	500
<b>Type "N"</b> 	AK20RN	20 R 1 K	20	20	25	1000
	AK25RN	25 R 1 K	25	20	34	1000
	AK30RN	30 R 1 K	30	20	41	500
	AK35RN	35 R 1 K	35	20	42	500
<b>Type "R"</b> Groove for rebar $\varnothing$ 8 mm Clip type "KN" for rebar up to $\varnothing$ 8 mm 	AK20ZR	20 Z 1 K	20	20	30	500
	AK25ZR	25 Z 1 K	25	20	39	500
	AK30ZR	30 Z 1 K	30	20	40	500
	AK35ZR	35 Z 1 K	35	20	54	500
	AK40ZR	40 Z 1 K	40	20	61	250
<b>Type "S"</b> Groove for rebar $\varnothing$ 10 + 12 mm $\varnothing$ 16 mm on request Clip type "SN" for rebar from $\varnothing$ 10 - 16 mm 	AK30ZS	30 Z 1 K	30	20	46	500
	AK35ZS	35 Z 1 K	35	20	57	500
	AK40ZS	40 Z 1 K	40	20	66	250
	AK45ZS	45 Z 1 K	45	20	76	250
	AK50ZS	50 Z 1 K	50	20	79	250
<b>Spacer for heavy single reinforcement</b>						
Groove for rebar up to $\varnothing$ 16 mm Clip type "PL" for rebar from $\varnothing$ 10 - 16 mm 	AK40E16	40 E 16 K	40	40	120	125
	AK45E16	45 E 16 K	45	40	141	125
	AK50E16	50 E 16 K	50	40	165	125
	AK55E16	55 E 16 K	55	40	175	125
	AK60E16	60 E 16 K	60	40	179	125
Can also be supplied with groove for larger rebar diameters. Clip type "PX" for rebars $\varnothing$ 20 - 28 mm (min. support width 70 mm) or tying wire can be supplied on request.						

Packaging: plastic woven sack with paper lining, 40 sacks per pallet

# Spacers with cross-clips

made of fibre concrete for horizontal and vertical reinforcement



Spacers with cross-clips – secure fixing at the crossing point for vertical reinforcement by means of a 2 mm thick steel clip and the preformed groove.

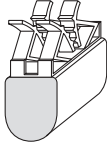
	Article number	Type	Concrete cover mm	Cut width mm	Weight kg/ 1000 pcs.	Sack cont. pcs.	
	AK25S5Q10	25 S 5 Q 10	25	36	59	500	
	AK30S5Q10	30 S 5 Q 10	30	36	70	250	
	AK35S5Q10	35 S 5 Q 10	35	36	77	250	
	AK40S6Q10	40 S 6 Q 10	40	40	91	250	
	AK45S6Q10	45 S 6 Q 10	45	40	98	250	
	AK50S6Q10	50 S 6 Q 10	50	40	108	250	
	AK55S6Q10	55 S 6 Q 10	55	40	115	125	
	AK60S6Q10	60 S 6 Q 10	60	40	122	125	
	<b>Groove for rebar from <math>\varnothing</math> 3 to 10 mm</b> 	AK30S5Q16	30 S 5 Q 16	30	36	70	250
		AK35S5Q16	35 S 5 Q 16	35	36	81	250
AK40S6Q16		40 S 6 Q 16	40	40	92	250	
AK45S6Q16		45 S 6 Q 16	45	40	107	250	
AK50S6Q16		50 S 6 Q 16	50	40	112	250	
AK55S6Q16		55 S 6 Q 16	55	40	120	125	
AK60S6Q16		60 S 6 Q 16	60	40	128	125	
AK65S6Q16		65 S 6 Q 16	65	40	136	125	
<b>Groove for rebar from <math>\varnothing</math> 12 to 16 mm</b> 	AK70S6Q16	70 S 6 Q 16	70	40	143	125	

Packaging: plastic woven sack with paper lining, 40 sacks per pallet

# Spacers with plastic clips

made of fibre concrete, no tying wire within the concrete cover



	Article number	Type	Concrete cover mm	Cut width mm	Weight kg/1000 pcs.	Sack cont. pcs.
 <p>With plastic clip for rebar from <math>\varnothing</math> 8 to 12 mm</p>	AC20R6Z10	20 R 6 Z 10	20	36	47	500
	AC25R6Z10	25 R 6 Z 10	25	36	57	500
	AC30R6Z10	30 R 6 Z 10	30	36	75	500
	AC35R6Z10	35 R 6 Z 10	35	36	85	250
	AC40R6Z10	40 R 6 Z 10	40	36	101	250
	AC45R6Z10	45 R 6 Z 10	45	36	116	250
	AC50R6Z10	50 R 6 Z 10	50	36	125	250
	AC55R6Z10	55 R 6 Z 10	55	36	145	125
	AC60R6Z10	60 R 6 Z 10	60	36	153	125

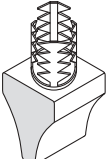
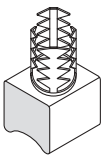
Packaging: plastic woven sack with paper lining, 40 sacks per pallet

Spacer and plastic clip guarantee a secure and exact concrete cover  
 → no metal parts within the concrete cover.

# Spacers with shuttlecock clips

made of fibre concrete, no tying wire within the concrete cover



	Article number	Type	Concrete cover mm	Cut width mm	Weight kg/1000 pcs.	Sack cont. pcs.
 <p>Concave version for rebar from <math>\varnothing</math> 4 – 8 mm</p>	AC20K6F6	20 K6F 6	20	40	31	500
	AC25K6F6	25 K6F 6	25	40	43	500
	AC30K6F6	30 K6F 6	30	40	45	250
	AC35K6F6	35 K6F 6	35	40	57	250
	AC40K6F6	40 K6F 6	40	40	70	250
	AC45K6F6	45 K6F 6	45	40	73	250
	AC50K6F6	50 K6F 6	50	40	75	250
 <p>Grooved version for rebar from <math>\varnothing</math> 4 – 8 mm</p>	AC55K6F6	55 K6F 6	55	40	100	125
	AC60K6F6	60 K6F 6	60	40	102	125
	AC20H6F6	20 H6F 6	20	40	43	500
	AC25H6F6	25 H6F 6	25	40	56	500
	AC30H6F6	30 H6F 6	30	40	60	250
	AC35H6F6	35 H6F 6	35	40	66	250
	AC40H6F6	40 H6F 6	40	40	91	250
	AC45H6F6	45 H6F 6	45	40	113	250
	AC50H6F6	50 H6F 6	50	40	126	250
	AC55H6F6	55 H6F 6	55	40	140	125
	AC60H6F6	60 H6F 6	60	40	154	125

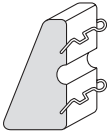
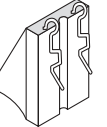
Packaging: plastic woven sack with paper lining, 40 sacks per pallet

Spacers with shuttlecock clips secure the exact concrete cover for reinforcing steel mats or reinforcement not walked on, e.g. in the precasting plant.

# Spacers for concrete pipe production

## made of fibre concrete



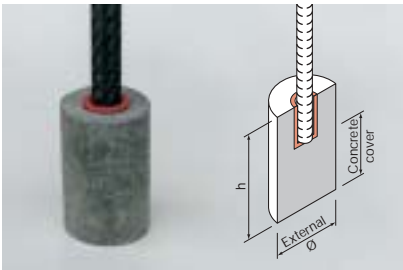
	Article number	Type	Concrete cover mm	Cut width mm	Weight kg/ 1000 pcs.	Sack cont. pcs.
Transverse groove for rebar $\varnothing$ 8 mm Clip for rebar $\varnothing$ 6 mm 	AK25Q3K	25 Q3K	25	28	80	500
	AK30Q3K	30 Q3K	30	28	88	250
	AK35Q3K	35 Q3K	35	28	95	250
	AK40Q3K	40 Q3K	40	28	111	250
	AK45Q3K	45 Q3K	45	28	126	250
Longitudinal groove for rebar $\varnothing$ 6 mm Clip for rebar $\varnothing$ 8 mm 	AK50Q3K	50 Q3K	50	28	132	250
	AK25L10K	25 L10K	25	55	64	500
	AK30L10K	30 L10K	30	55	75	250
	AK35L10K	35 L10K	35	55	80	250
	AK40L10K	40 L10K	40	55	90	250
	AK45L10K	45 L10K	45	55	96	250
AK50L10K	50 L10K	50	55	101	250	

Spacers for concrete pipe production - fixed to both internal and external concrete pipe reinforcement.

Transverse or longitudinal groove for rebar  $\varnothing$  8 - 10 mm can be supplied for all types.  
 Please state when ordering: e.g.: 30Q3KE10 or 30L10KE10  
 Packaging: plastic woven sack with paper lining, 40 sacks per pallet

# Reinforcement end supports

## made of fibre concrete used as stands for vertical single rebars



- Just press onto rebar end – self-clipping
- Very high loading capacity – cannot tip over
- Can be supplied in any required concrete cover thickness

Article number	External $\varnothing$ mm	Concrete cover mm	Height h mm	Weight kg/ 1000 pcs.	Sack contents pcs.
<b>suitable for rebar diameter: smooth: 3.5 – 5.0 mm; ribbed: 4.0 mm</b>					
FBSP53520-04*	25	20	35	35	500
FBSP53525-04*	25	25	40	40	500
FBSP53530-04*	25	30	45	45	500
FBSP53535-04*	25	35	50	50	250
FBSP53540-04*	25	40	55	55	250
FBSP53545-04*	25	45	60	60	250
FBSP53550-04*	25	50	65	65	250
<b>suitable for rebar diameter: smooth: 5.0 – 8.0 mm; ribbed: 4.0 - 8.0 mm</b>					
FBSP53520-06*	27	20	35	42	500
FBSP53525-06*	27	25	40	48	500
FBSP53530-06*	27	30	45	54	500
FBSP53535-06*	27	35	50	60	250
FBSP53540-06*	27	40	55	66	250
FBSP53545-06*	27	45	60	72	250
FBSP53550-06*	27	50	65	78	250
<b>suitable for rebar diameter: smooth: 6.0 – 10.0 mm; ribbed: 6.0 - 10.0 mm</b>					
FBSP53520	35	20	40	80	250
FBSP53525	35	25	45	90	250
FBSP53530	35	30	50	100	250
FBSP53535	35	35	55	110	250
FBSP53540	35	40	60	120	250
FBSP53545	35	45	65	130	200
FBSP53550	35	50	70	140	200
<b>suitable for rebar diameter: smooth: 11.0 – 14.0 mm; ribbed: 10.0 - 14.0 mm</b>					
FBSP53520-12*	45	20	50	164	125
FBSP53525-12*	45	25	55	181	125
FBSP53530-12*	45	30	60	197	125
FBSP53535-12*	45	35	65	214	100
FBSP53540-12*	45	40	70	230	100
FBSP53545-12*	45	45	75	246	100
FBSP53550-12*	45	50	80	263	100
<b>suitable for rebar diameter: smooth: 13.0 – 16.0 mm; ribbed: 12.0 - 16.0 mm</b>					
FBSP53520-14*	45	20	50	164	125
FBSP53525-14*	45	25	55	181	125
FBSP53530-14*	45	30	60	197	125
FBSP53535-14*	45	35	65	214	100
FBSP53540-14*	45	40	70	230	100
FBSP53545-14*	45	45	75	246	100
FBSP53550-14*	45	50	80	263	100



Special profile No. 121 for larger rebar diameters can be manufactured at short notice to site requirements.

Packaging: plastic woven sack, 40 sacks per pallet; \* Delivery time: approx. 5 working days

# Kickers made of fibre concrete

## acting as continuous stop spacers between shutters



Square profile with 2 nail holes

Length in cm	Article number 30 x 30 mm	Article number 40 x 40 mm	Article number 50 x 50 mm
11	SAV300110	SAV400110	SAV500110
12	SAV300120	SAV400120	SAV500120
13	SAV300130	SAV400130	SAV500130
14	SAV300140	SAV400140	SAV500140
15	SAV300150	SAV400150	SAV500150
16	SAV300160	SAV400160	SAV500160
17	SAV300170	SAV400170	SAV500170
18	SAV300180	SAV400180	SAV500180
19	SAV300190	SAV400190	SAV500190
20	SAV300200	SAV400200	SAV500200
21	SAV300210	SAV400210	SAV500210
22	SAV300220	SAV400220	SAV500220
23	SAV300230	SAV400230	SAV500230
24	SAV300240	SAV400240	SAV500240
25	SAV300250	SAV400250	SAV500250
26	SAV300260	SAV400260	SAV500260
27	SAV300270	SAV400270	SAV500270
28	SAV300280	SAV400280	SAV500280
29	SAV300290	SAV400290	SAV500290
30	SAV300300	SAV400300	SAV500300

- Simple to fix
- Best bonding properties between fibre and in-situ concrete

# "Fix 2" Kickers

## acting as continuous stop spacers between shutters



The kicker is fixed into the U-profile with a nail to prevent further displacement after the shuttering has been quickly and exactly aligned.

For wall thickness	Article number plastic	Article number fibre concrete
10	SAKU10	-
12	SAKU12	-
15	SAKU15	SAFB15
17	SAKU17	SAFB17
18	SAKU18	SAFB18
20	SAKU20	SAFB20
24	SAKU24	SAFB24
25	SAKU25	SAFB25
27	SAKU27	SAFB27
30	SAKU30	SAFB30
35	SAKU35	SAFB35
36	SAKU36	SAFB36
40	SAKU40	SAFB40
45	SAKU45	SAFB45
50	SAKU50	SAFB50

Minimum order: 100 pcs. per size

- Versions with fibre concrete or plastic ends
- BSt 500/550 RK spacer bar – up to 24 cm wall thickness with Ø 6 mm, above wall thickness 25 cm with Ø 8 mm
- Kicker intervals between 0.80 and 2.00 m depending on the shuttering element size
- If a waterstop is used, an extended U-profile is necessary; please ask for details.

# Kickers made of fibre concrete

## acting as stop spacers between shutters

Disk-shaped profile with nail hole  $\varnothing$  approx. 5 mm

With nail insert and nail for nail gun on request

- No penetrations through the wall
- Any wall thickness possible
- Suitable for the use with the injection hose or the waterstop
- Rapid and problem-free fixing with the nail gun
- Only one type for all applications



Without nail insert article number	With nail insert article number	External $\varnothing$ mm	Height mm	Weight kg/1000 pcs.	Pack. unit/ pcs.
SAR60	SAR60N	60	40	225	100
SAR80	SAR80N	80	40	400	100

**Nails** (suitable for the nail gun)

Article number	Shaft $\varnothing$ mm	Shaft length mm	Weight kg/1000 pcs.	Pack. unit/ pcs.
SAFBRN72	3.7	72	8.0	100

# Plastic kickers

## acting as stop spacers between shutters



**Kickers for nailing or the nail-gunning**

Article number	External $\varnothing$ mm	Height mm	Weight kg/1000 pcs.	Pack. unit/ pcs.
SAKURU	49	35	17	100

**Nails** (suitable for the nail gun)

Article number	Shaft $\varnothing$ mm	Shaft length mm	Weight kg/1000 pcs.	Pack. unit/ pcs.
SAKURN	3.7	62	7.0	100

**Kickers with a pre-fitted nail**

Article number	Pack. unit/ pcs.
SAKRVN	100

FRANK



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