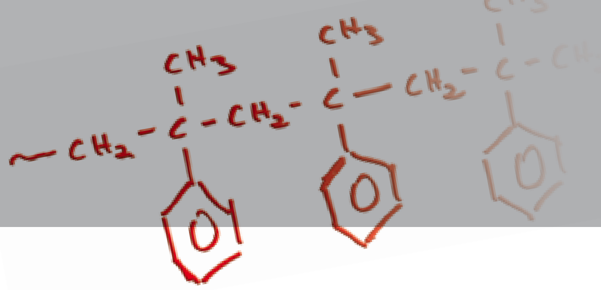
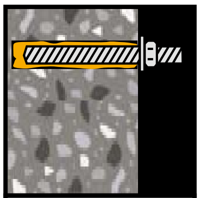


CHEMOFAST®

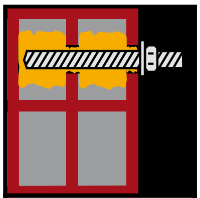
TECHNICAL DATA SHEET

STP SFP

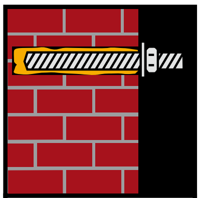
2K Reaction resin mortar based on Polyester



Application in non-cracked concrete



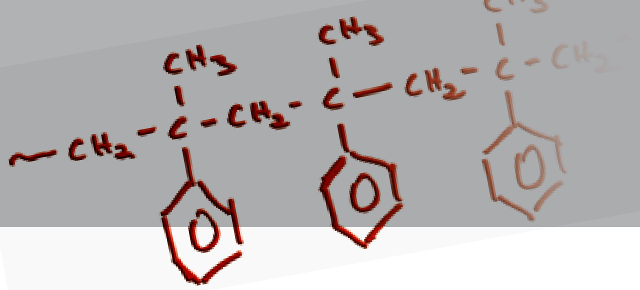
Application in hollow masonry



Application in solid masonry

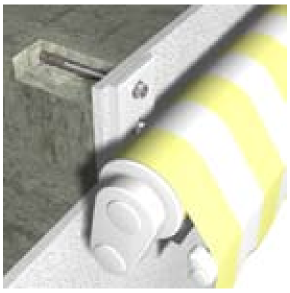
Content Page

CHEMOFAST® Anchoring GmbH
Hanns-Martin-Schleyer-Str. 23
47877 Willich, Germany
Telephone +49 (0) 21 54 / 81 23-0
Fax +49 (0) 21 54 / 81 23-3 26
www.chemofast.de
info@chemofast.de



STP SFP

2K Reaction resin mortar based on Polyester



Product description

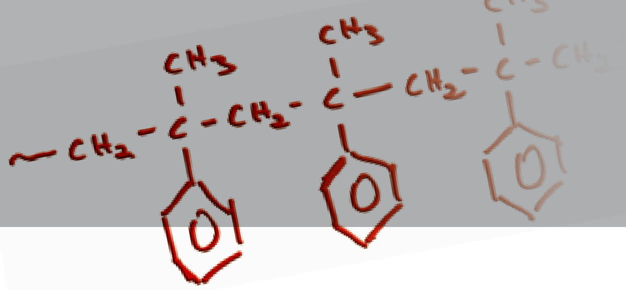
The P is a 2-component reaction resin mortar based on polyester and will be delivered in a 2-C cartridge (ST - standard cartridge; SF-foil tube cartridge) system. This product may be used in combination of a hand-, battery-, or pneumatic tool and a static mixer. It was designed as a cost-effective alternative for the anchoring of threaded rods and internal threaded rod sleeves for non-approved applications. By using a screen sleeve, an easy and save application in hollow bricks is guaranteed. The P product is characterised by good applications with an ambiance temperature up to 80°C.

Properties and benefits

- Application in uncracked concrete, solid brick and hollow brick with comercial threaded rods
- overhead application
- Suitable for attachment points close to the edge, since anchoring is free of expansion forces
- National approval in masonry Z-21.3-1755
- high bending- and pressure strength
- reduced chemical resistance
- Cartridge can be reused up to the end of the shelf life by replacing the static mixer or resealing cartridge with the screw cap
- Mechanical properties acc. to EN 196 Part1
  - Density: 1,67 kg/dm²
  - Compressive strength: 108 N/mm²
  - Bending strength: 56 N/mm²
  - Dynamic modulus of elasticity: 3300 N/mm²

Applications samples

Suitable for the fixation of facades, roofs, wood construction, metal construction; metal profils, console, railing, sanitary devices, cable trays, piping, etc.



STP SFP

2K Reaction resin mortar based on Polyester

Applications and intended use

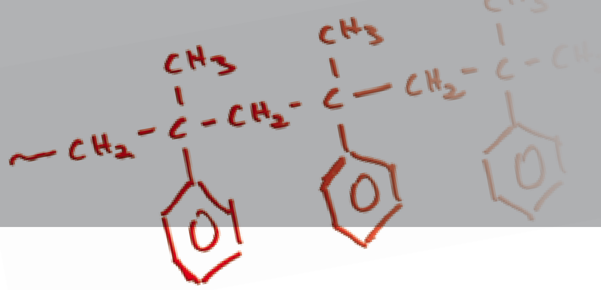
- **Underground:**
non-cracked concrete, light-concrete, porous-concrete, solid masonry, hollow brick, natural stone (Attention! natural stone, can discolour; shall be checked in advance); hammer drilled holes
- **Anchor elements:**
Threaded rods (zinc plated or hot dip, stainless steel and high corrosion resistance steel), reinforcing bars, internal threaded rods, profiled rod, steel section with undercuts (e.g. perforated section)
- **Temperature range:**
Installation temperature +5°C up to +35°C
cartridge temperature min. +5°C; optimal +20°C
-40°C to +80°C ambience temperature after full curing

Handling and storage

- **Storage:**
store in a cold and dark place, storage temperature: from +5°C up to +25 °C
- **Shelf life:**
12 months for standard cartridge (ST); 9 months for foil tube cartridge (SF)

Reactivity

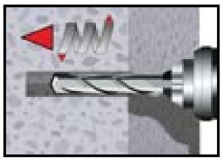
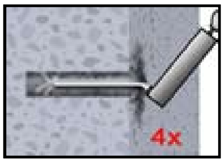
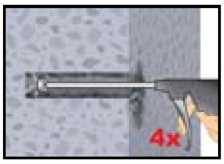
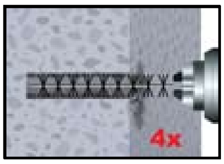
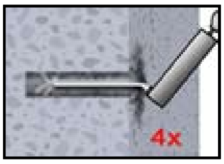
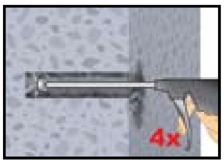
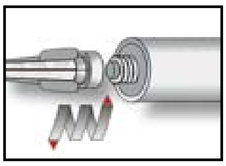
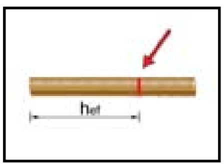
Temperature of base material	Gelling- and working time	Full curing time in dry base material	Full curing time in wet base material
+5°C	25 Min.	120 Min.	240 Min.
+10°C	15 Min.	80 Min.	160 Min.
+20°C	6 Min.	45 Min.	90 Min.
+30°C	4 Min.	25 Min.	50 Min.
+35°C	2 Min.	20 Min.	40 Min.

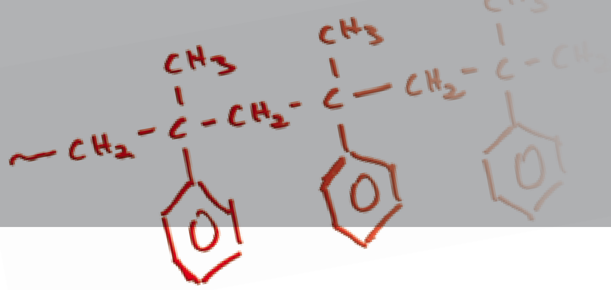


STP SFP

2K Reaction resin mortar based on Polyester

Usage instructions - concrete

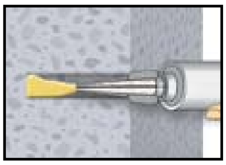
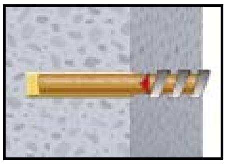
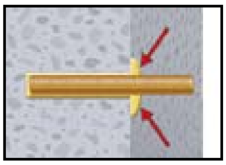
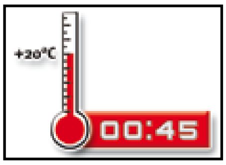
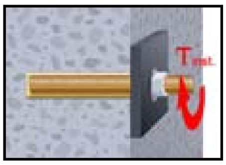
	**1** Drill with hammer drill mode a hole into the base material to the size and embedment depth required by the selected anchor.
 or 	**2a.** Standing water must be removed bevor cleaning. Starting from the bottom or back of the bore hole, blow the hole clean with compressed air or a hand pump a minimum of four times. If the bore hole ground is not reached an extension shall be used. The hand-pump can be used for anchor sizes up to bore hole diameter 20 mm. For bore holes larger then 20mm or deeper then 240mm, compressed air (min. 6 bar) must be used.
	**2b.** Check brush diameter acc. to table 5 and attach the brush to a drilling machine or a battery screwdriver. Brush the hole with an appropriate sized wire brush of four times. If the bore hole ground is not reached with the brush, a brush extension shall be used.
 or 	**2c.** Finally blow the hole clean again with compressed air or a hand pump a minimum of four times. If the bore hole ground is not reached an extension shall be used. The hand-pump can be used for anchor sizes up to bore hole diameter 20 mm. For bore holes larger then 20mm or deeper then 240mm, compressed air (min. 6 bar) must be used.
	**3.** Attach a supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. For every working interruption longer than the recommended working time as well as for new cartridges, a new static-mixer shall be used.
	**4.** Prior to inserting the anchor rod into the mortar filled bore hole, the position of the embedment depth shall be marked on the anchor rods.

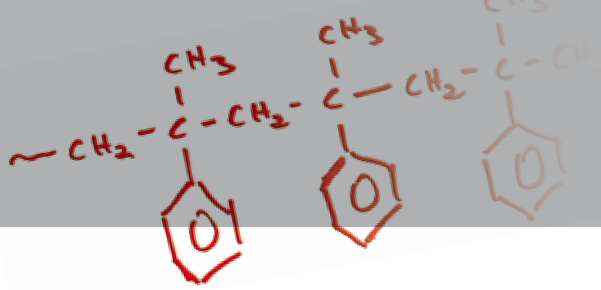


STP SFP

2K Reaction resin mortar based on Polyester

Usage instructions - concrete

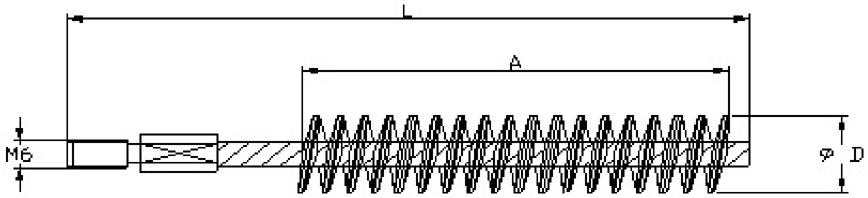
	5. Prior to dispensing into the anchor hole, squeeze out separately a minimum of three full strokes and discard non-uniformly mixed adhesive components until the mortar shows a consistent grey colour.
	6. Starting from the bottom or back of the cleaned anchor hole fill the hole up to approximately two-thirds with adhesive. Slowly withdraw the static mixing nozzle as the hole fills to avoid creating air pockets. Observe the gel-/ working times given.
	7. Push the threaded rod or reinforcing bar into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor should be free of dirt, grease, oil or other foreign material.
	8. Be sure that the anchor is fully seated at the bottom of the hole and that excess mortar is visible at the top of the hole. If these requirements are not maintained, the application has to be renewed.
	9. Allow the adhesive to cure to the specified time prior to applying any load or torque. Do not move or load the anchor until it is fully cured.
	10. After full curing, the add-on part can be installed with the max. torque by using a calibrated torque wrench.



STP SFP

2K Reaction resin mortar based on Polyester

Cleaning of the drill hole - concrete



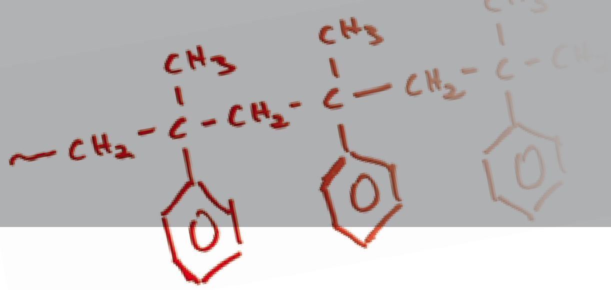
Brush:
Ø 0,20 mm (A2) Steel wire
Brush length: 80 mm
M6 thread for drilling machine connection

Blower

Threaded rod	Bore hole-Ø	Brush-Ø	min. brush-Ø	Brush length
(mm)	(mm)	d_b (mm)	$d_{b,min}$ (mm)	L (mm)
M 8	10,0	12,0	10,5	170
M 10	12,0	14,0	12,5	170
M 12	14,0	16,0	14,5	200
M 16	18,0	20,0	18,5	300
M 20	24,0	26,0	24,5	300

Setting parameter - concrete

Anchor size				M8	M10	M12	M16	M20
Edge distance	1,0 x h_{ef}	C_{cr_1N}	[mm]	80	90	110	125	170
Min. edge distance	5,0 x d	C_{min}	[mm]	40	50	60	80	100
Axial distance	2,0 x h_{ef}	S_{cr_1N}	[mm]	160	180	220	250	340
Min. axial distance	5,0 x d	S_{min}	[mm]	40	50	60	80	100
Embedment depth		h_{ef}	[mm]	80	90	110	125	170
Min. part thickness		h_{min}	[mm]	h_{ef} + 30 mm			h_{ef} + $2d_o$	
Anchor diameter		d	[mm]	8	10	12	16	20
Drill diameter		d_o	[mm]	10	12	14	18	24
Installation torque		$T_{inst.}$	[Nm]	10	20	40	60	120



STP SFP

2K Reaction resin mortar based on Polyester

Performance data - concrete

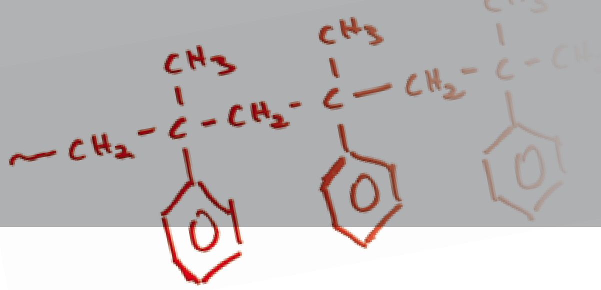
TENSION LOADS - Design method A acc. to ETAG 001 Annex C, characteristic values for tension loading

Anchor size				**M8**	**M10**	**M12**	**M16**	**M20**
Steel failure								
Characteristic tension resistance, Steel, zinc plated or hot dip, property class 5.8		$N_{Rk,s}$	[kN]	18	29	42	78	122
Characteristic tension resistance, Steel, zinc plated or hot dip, property class 8.8		$N_{Rk,s}$	[kN]	29	46	67	125	196
Partial safety factor		$\gamma_{Ms,N}$		1,50				
Characteristic tension resistance, Stainless steel A4 and HCR		$N_{Rk,s}$	[kN]	26	41	59	110	172
Partial safety factor		$\gamma_{Ms,N}$		1,87				
Pullout and concrete cone failure [1]								
Characteristic bond resistance in concrete C20/25								
50°C/80°C[2]	uncracked concrete	$N_{Rk,p} = N^0_{Rk,c}$	[kN]	11	17	24	27	46
Partial safety factor (dry and wet)		$\gamma_{Mp} = \gamma_{Mc}$		1,8				
Embedment depth		h_{ef}	[mm]	80	90	110	125	170
Edge distance		$c_{cr,N}$	[mm]	80	90	110	125	170
Axial distance		$s_{cr,N}$	[mm]	$2 \times c_{cr,N}$				
Increasing factors for non-concrete concrete ψ_c				$(f_{ck}^{0,30})/2,63$				
Splitting failure								
Edge distance		$c_{cr,sp}$	[mm]	$c_{cr,N} \leqq 2\,h_{ef}\,(2,5 - h/h_{ef}) \leqq 2,4\,h_{ef}$				
Axial distance		$s_{cr,sp}$	[mm]	$2 \times c_{cr,sp}$				
Partial safety factor (dry and wet)		γ_{Msp}		1,8				

The data in this table are intended to use together with the design provisions of ETAG 001 Annex C

1) shall be determined acc. this table or acc. to 5.2.2.4, Annex C of ETAG 001. The smaller value is decisive.

2) short term temperature / Long term temperature . Long term concrete temperatures are roughly constant over significant periods of time. Short term elevated temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.



STP SFP

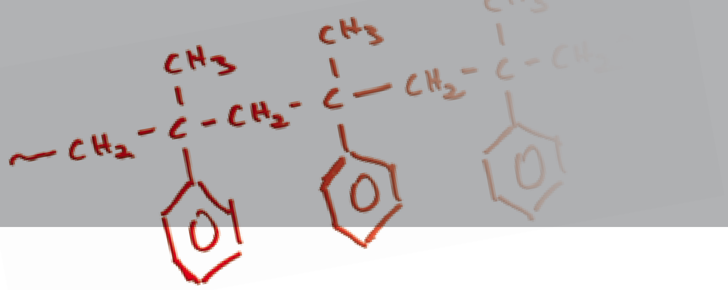
2K Reaction resin mortar based on Polyester

Performance data - concrete

SHEAR LOADS - Design method A acc. to ETAG 001 Annex C, characteristic values for shear loading

Anchor size			M8	M10	M12	M16	M20
Steel failure without leaver arm							
Characteristic shear resistance, Steel, zinc plated or hot dip, property class 5.8	$V_{Rk,s}$	[kN]	9	15	21	39	61
Characteristic shear resistance, Steel, zinc plated or hot dip, property class 8.8	$V_{Rk,s}$	[kN]	15	23	34	63	98
Partial safety factor	$\gamma_{Ms,V}$		1,25				
Characteristic shear resistance, Stainless steel A4 and HCR	$V_{Rk,s}$	[kN]	13	20	30	55	86
Partial safety factor	$\gamma_{Ms,V}$		1,56				
Steel failure with leaver arm							
Characteristic bending moment, Steel, zinc plated or hot dip, property class 5.8	$M^{o}_{Rk,s}$	[Nm]	19	37	65	166	324
Characteristic bending moment, Steel, zinc plated or hot dip, property class 8.8	$M^{o}_{Rk,s}$	[kN]	30	60	105	266	519
Partial safety factor	$\gamma_{Ms,V}$		1,25				
Characteristic bending moment, Stainless steel A4 and HCR	$M^{o}_{Rk,s}$	[kN]	26	52	92	232	454
Partial safety factor	$\gamma_{Ms,V}$		1,56				
Concrete Pryout failure							
Factor k			2,0				
Partial safety factor	γ_{Mcp}		1,5				
Concrete edge failure							
Effective length of anchor in shear loading	l_f	[mm]	80	90	110	125	170
Outside diameter of anchor	d_{nom}	[mm]	10	12	14	18	24
Partial safety factor	γ_{Mc}		1,5				

The data in this table is intended to used together with the design provisions of ETAG 001 Annex C.



STP SFP

2K Reaction resin mortar based on Polyester

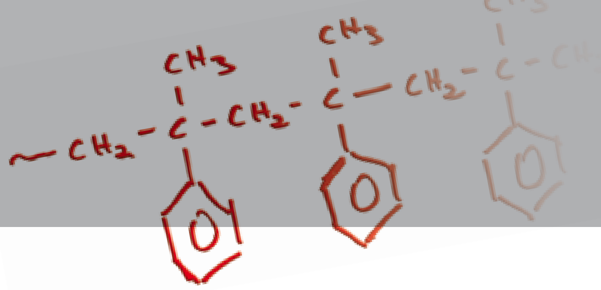
Recommended loads - concrete

The recommended loads are only valid for single anchor for a roughly design, if the following conditions are valid:
dry or wet bore hole, uncracked concrete C20/25, steel 5.8
$c \geqq c_{cr,N}$
$s \geqq s_{cr,N}$
$h \geqq 2 \times h_{ef}$

If the conditions are not fulfilled the loads must be calculated acc. to ETAG 001 Annex C.
The safety factors are already included in the recommended loads.

Anchor size			M8	M10	M12	M16	M20
Embedment depth	h_{ef}	[mm]	80	90	110	125	170
Edge distance	$c_{cr,N}$	[mm]	$1{,}5 \times h_{ef}$				
Axial distance	$s_{cr,N}$	[mm]	$3{,}0 \times h_{ef}$				
Recommended tension load 50°C/80°C[2)]	N_{Rec}	[kN]	4,5	6,9	9,6	10,8	18,1
Recommended shear load without leaver arm for Steel property class 5.8[1)]	V_{Rec}	[kN]	5,1	8,6	12,0	22,3	34,9

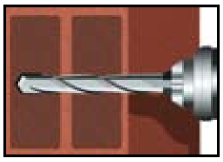
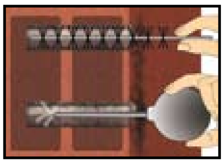
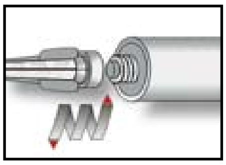
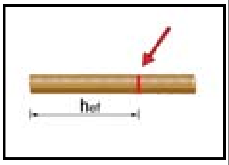
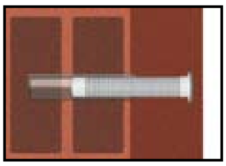
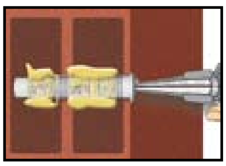
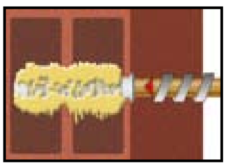
1) Shear load with leaver arm acc. Annex C of ETAG 001.
2) short term temperature / Long term temperature. Long term concrete temperatures are roughly constant over significant periods of time. Short term elevated temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

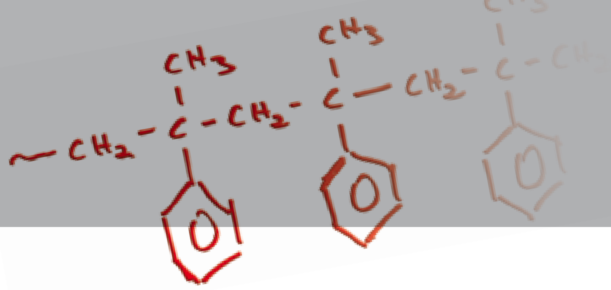


STP SFP

2K Reaction resin mortar based on Polyester

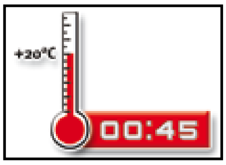
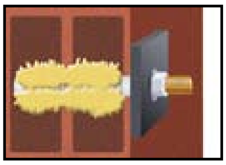
Usage instructions - hollow bricks

	1. Drill without hammer drill mode a hole into the base material to the size and embedment depth required by the selected anchor.
	2. In case of a water filled bore hole, the water has to be removed from the hole (e.g. by compressed air or vacuum cleaner). Starting from the bottom or back of the hole, blow the hole clean with a hand pump a minimum of two times. Then brush the hole with nylon brush a minimum of two times. Finally clean the hole again with a hand pump a minimum of two times.
	3. Attach a supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. After every working interruption longer than the recommended working time as well as for new cartridges, a new static-mixer shall be used.
	4. Prior to inserting the anchor rod into the filled bore hole, the position of the embedment depth shall be marked on the anchor rods.
	5. Prior to dispensing the mortar into the bore hole, squeeze out separately a minimum of three full strokes and discard non-uniformly mixed adhesive components until the mortar shows a consistent grey colour.
	6. Insert the perforated sleeve into the bore hole. Make sure that the sleeve fits well into the hole. Never cut the sleeve! Only use sleeves that have the right length.
	7. Starting from the back fill the sleeve completely with adhesive. Observe the gel-/ working times.
	8. Push the threaded rod or reinforcement bar into the sleeve while turning it slightly to ensure a distribution of the adhesive until the back of the sleeve is reached. The anchor should be free of dirt, grease, oil or other foreign material.



STP SFP

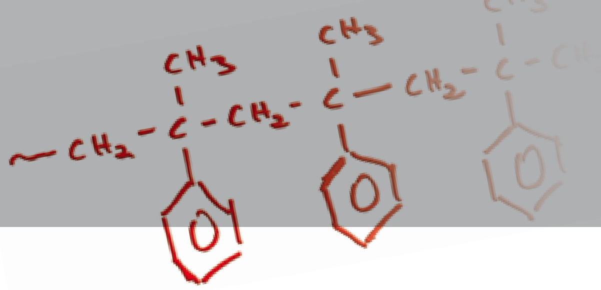
2K Reaction resin mortar based on Polyester

	9. Allow the adhesive to cure to the specified time prior to applying any load to torque. Do not move or load the anchor until it is fully cured.
	10. After full curing, the add-on part can be installed with the max. torque by using a calibrated torque wrench.

Cleaning - masonry

- Brush:
  20 mm Nylon; Length: 80 mm

- Blower



STP SFP

2K Reaction resin mortar based on Polyester

Performance data - masonry

Stone	Strength class	Recommended loads		Standard sleeves				Wing sleeve	
				M6	M8	M10	M12	M8	M10
Hollow brick	Hlz 4	F_{rec}	[kN]	0,3	0,3	0,3	0,3	0,3	0,3
	Hlz 6			0,4	0,4	0,4	0,4	0,4	0,4
	Hlz 12			0,7	0,8	0,8	0,8	0,8	0,8
Sand -lime hollow brick	KSL 4	F_{rec}	[kN]	0,3	0,3	0,3	0,3	0,3	0,3
	KSL 6			0,4	0,4	0,4	0,4	0,4	0,4
	KSL 12			0,7	0,8	0,8	0,8	0,8	0,8
Sand -lime solid brick1)	KS 12	F_{rec}	[kN]	0,5	1,7	1,7	1,7	1,7	1,7
Solid brick1)	Mz 12	F_{rec}	[kN]	0,5	1,7	1,7	1,7	1,7	1,7
Light concrete hollow brick	Hbl 2	F_{rec}	[kN]	0,3	0,3	0,3	0,3	-	-
	Hbl 4			0,5	0,6	0,6	0,6	-	-
Concrete hollow brick	Hbn 4	F_{rec}	[kN]	0,5	0,6	0,6	0,6	-	-

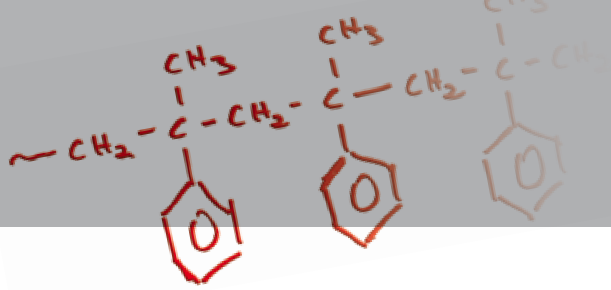
Installation parameters									
Axial distance plug group		$s_{cr,N\ Group}$	[mm]	Hlz, KSL, MZ, KS = 100 Hbl, Hbn = 200				100	
Min. axial distance plug group2)		$s_{min\ Group}$	[mm]	Hlz, KSL, MZ, KS = 50 Hbl, Hbn = 200				50	
Axial distance between single plugs		$s_{cr,N\ Single}$	[mm]	250				250	
Edge distance		$c_{cr,N}$	[mm]	250				200 (250)3)	
Min. edge distance4)		c_{min}	[mm]	250				50 (60)3)	
Embedment depth of rod	with sleeve	h_{ef}	[mm]	50	85	85	85	80	90
	without sleeve	h_{ef}	[mm]	60	80	90	110	80	90
Drilling depth	with sleeve	h_o	[mm]	55	90	90	90	105	105
	without sleeve	h_o	[mm]	65	85	95	115	85	95
Minimum part thickness		h_{min}	[mm]	110			125	110	
Drill diameter		d_o	[mm]	11	16	16	16	14	16
Hole diameter in fixed element		d_f	[mm]	7	9	12	14	9	12
Installation torque		T_{inst}	[Nm]	3	8	8	8	2	2

1) Anchoring in masonry of solid lime-sand bricks (KS) and masonry bricks (Mz) does not require perforated sleeve.

2) It is permissible to go below the axial spacing to the minimum value for anchor pairs and groups of four, if the permissible loads are reduced. The maximum loads must not be exceeded.

3) Value in brackets applies to solid bricks (Mz and KS).

4) Applies to masonry with top load or proof of tilt. Does not apply to shear loads directed towards a free edge.



STP SFP

2K Reaction resin mortar based on Polyester

Performance data - masonry

Reduced permissible loads with reduced axial spacing per anchor in anchor groups

$s_{cr,N\ Group} \geq s > s_{min}$

Anchor pairs:

red F = $\chi s \cdot$ F rec

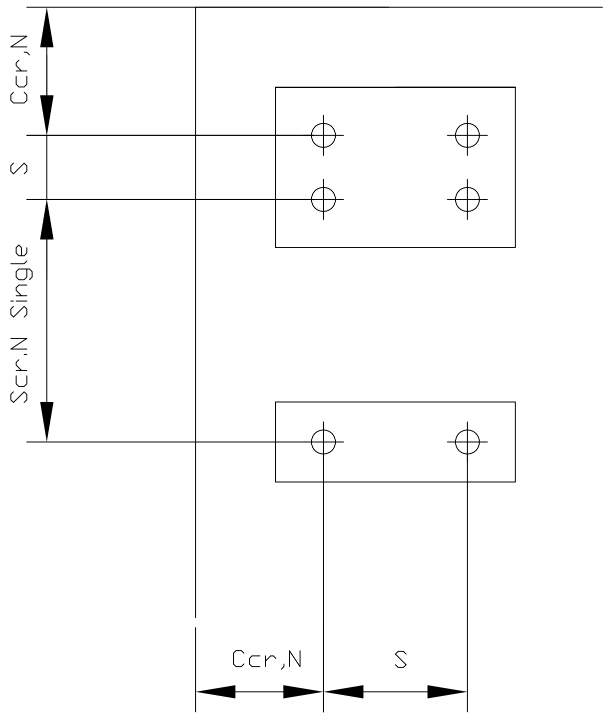
$\chi s = \frac{1}{2}\,(1 + s/s_{cr,N\ Group}) \leq 1{,}0$

Groups of four:

red F = $\chi s_1 \cdot \chi s_2 \cdot$ F rec

$\chi s_{1,2} = \frac{1}{2}\,(1 + s_{1,2}/s_{cr,N\ Group}) \leq 1{,}0$

F rec = Permissible load per anchor
red F = Reduced load per anchor
$s_{cr,N\ Group}$ = Axial spacing
s = Reduced axial spacing



Permissible load in [kN] for each single brick				
Brick format		‹ 4 DF	4 bis 10 DF	≥ 10DF
Without top load	max F [kN]	1,0	1,4	2,0
With top load	max F [kN]	1,4	1,7	2,5