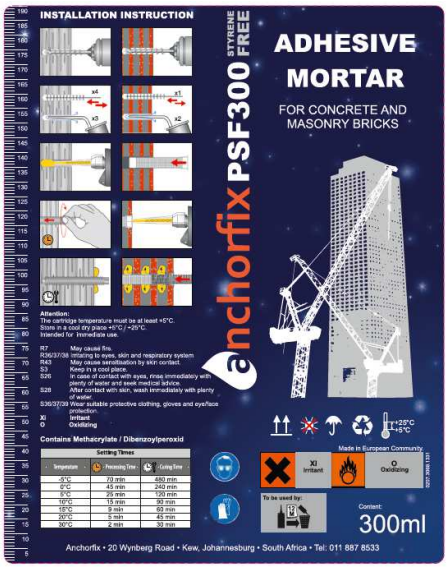
PSF-300 – Polyester resin for use in lightweight substrates

Bonded anchor with anchor rod made of galvanized steel or stainless steel of sizes M8 to M30 for use in lightweight and hollow substrates



Basic product information

Features

- Several embedment depths
- Styrene free resin (odorless)
- ETAG 001-5 Option 7
- **PSF-300** – basic version
- **PSF-300-S** – summer version
- **PSF-300-W** – winter version
- **STUD** – carbon steel, class 5.8 acc. EN ISO 898-1
- **STUD-88** – carbon steel , class 8.8 acc. EN ISO 898-1
  Coating thickness min. 5µm acc. EN ISO 4042
- **STUD-A4** – stainless steel, grade A4-70, A4-80
  acc. EN ISO 3506
  Steel material 1.4401, 1.4404, 1.4571 acc. EN 10088

Substrate

- Solid clay brick (e.g. Wienerberger Mz 20/2.0) 20N/mm^2
- Autoclaved aerated concrete blocks AAC 7 6N/mm^2
- Solid silicate bricks (e.g. KS NF 20/2.0) 20N/mm^2
- Silicate hollow blocks (e.g. KS Ratio 8 DF 12/1.4) 12N/mm^2
- Perforated ceramic blocks (e.g. Poroton Hlz 12/0.9 DF) 12N/mm^2
- Perforated ceramic blocks (e.g. Wienerberger Porotherm 25 P+W) 15N/mm^2
- Perforated ceramic blocks (e.g. Leier Thermopor 38 P+W) 10N/mm^2
- Perforated ceramic blocks (e.g. Kozłowice MEGA-MAX 250/238 P+W) 12N/mm^2
- Perforated ceramic blocks (e.g. LS Tableau Mono Rect) 6N/mm^2
- Perforated ceramic blocks (e.g. LS Tableau Rect) 6N/mm^2
- Perforated ceramic blocks (e.g. Monomur 30) 6N/mm^2
- Perforated ceramic blocks (e.g. SM BGV Thermo) 6N/mm^2
- Perforated ceramic blocks (e.g. SM BGV Thermo Plus) 6N/mm^2
- Lightweight concrete hollow blocks (e.g. Hbl) 2N/mm^2

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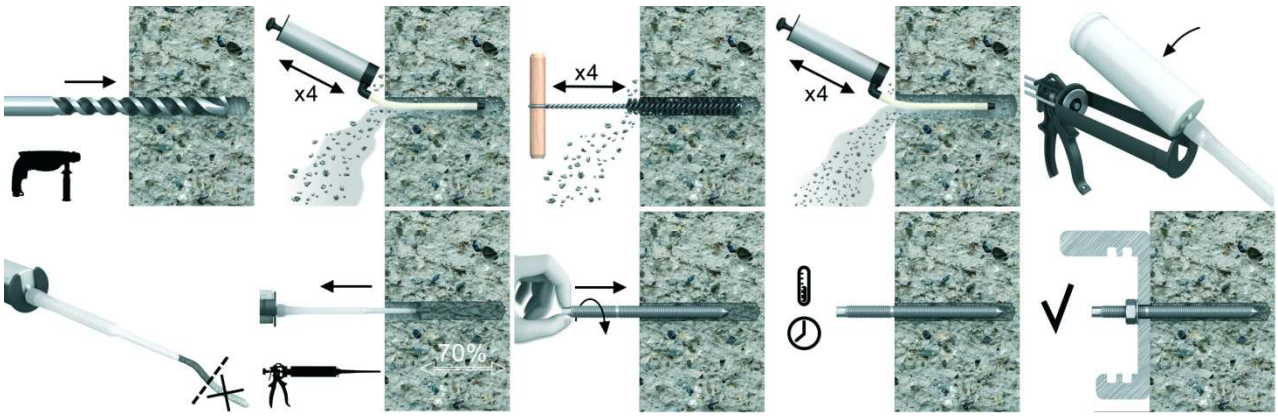
Installation guide

SOLID SUBSTRATES



HOLLOW SUBSTRATES

1. Drill hole to the correct diameter and depth for stud or mesh sleeve size being used.
   2.1 Solid substrates: Clean the hole with brush and hand pump at least four times each.
   2.2 Hollow substrates: Insert mesh sleeve into the hole.
3. Insert cartridge (or foil) into gun and attach nozzle.
4. Dispense to waste until an even colour is obtained. Insert the mixing nozzle to the far end of the hole and inject the resin, slowly withdrawing the nozzle as the hole is filled to:
   4.1 Solid substrates: 70% of its depth
   4.2 Hollow substrates: full mesh.
5. Immediately insert the rod, slowly and with a slight twisting motion. Remove excess of resin around the hole before it sets and leave it undisturbed until the curing time elapses.
6. Attach fixture and tighten the nut to the required torque.

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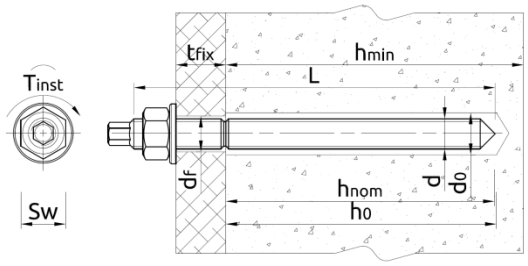
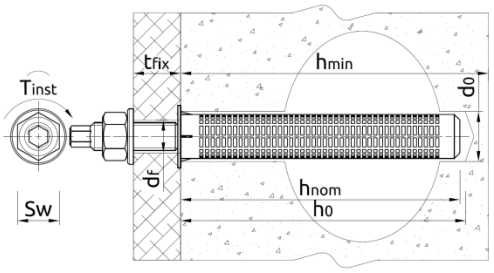
Installation data

Solid substrates



Substrate type			Ceramic solid substrate				Aerated concrete			
Size			**M8**	**M10**	**M12**	**M16**	**M8**	**M10**	**M12**	**M16**
Thread diameter	d	[mm]	8	10	12	16	8	10	12	16
Hole diameter in substrate	d_0	[mm]	10	12	14	18	10	12	14	18
Installation torque	T_{inst}	[Nm]	5	8	10	15	3	4	6	10
Wrench size	s_w	[mm]	13	17	19	24	13	17	19	24
Min. hole depth in substrate	h_0	[mm]	85	90	100	110	85	90	100	110
Installation depth	h_{nom}	[mm]	80	85	95	105	80	85	95	105
Min. spacing	s_{min}	[mm]	50	50	50	50	50	54	50	54
54Min. edge distance	c_{min}	[mm]	50	50	50	50	50	54	50	54

Hollow substrates



Size			M8		M10		M12		M16
Thread diameter	d	[mm]	8	8	10	10	12	12	16
Mesh sleeve size	d x l	[mm]	12x50	12x80	15x85	15x125	15x85	15x125	20x85
Hole diameter in substrate	d_0	[mm]	12	12	16	16	16	16	20
Installation torque	T_{inst}	[Nm]	3	3	4	4	6	6	10
Wrench size	s_w	[mm]	13	13	17	17	19	19	24
Min. hole depth in substrate	h_0	[mm]	55	85	90	130	90	130	90
Installation depth	h_{nom}	[mm]	50	80	85	125	85	125	85
Min. spacing	s_{min}	[mm]	100	100	100	100	100	100	120
54Min. edge distance	c_{min}	[mm]	100	100	100	100	100	100	120

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Minimum curing and working time

Resin temperature	Concrete temperature	Curing time*			Working time		
		Summer version	Standard version	Winter version	Summer version	Standard version	Winter version
[°C]	[°C]	[min]			[min]		
5	-20	-	-	1440	-	-	45
5	-15	-	-	1080	-	-	30
5	-10	-	-	480	-	-	20
5	-5	1440	480	300	180	70	11
5	0	1080	240	120	120	45	7
5	5	720	120	60	60	25	5
10	10	480	90	45	45	15	2
15	15	360	60	30	25	9	1.5
20	20	240	45	15	15	5	1
25	30	90	30	-	7	2	-
25	40	45	-	-	5	-	-

* For wet concrete the curing time must be doubled.

Mechanical properties

Size				M8	M10	M12	M16
Nominal tensile strength	STUDS	f_{uk}	[N/mm^2]	500	500	500	500
	STUDS-88			800	800	800	800
	STUDS-A4			700	700	700	700
Nominal yield stress	STUDS	f_{yk}	[N/mm^2]	400	400	400	400
	STUDS-88			640	640	640	640
	STUDS-A4			350	350	350	350
Cross-sectional area		A_s	[mm^2]	36.6	58.0	84.3	157.0
Section modulus		W_{el}	[mm^3]	31.2	62.3	109.2	277.5
Characteristic bending resistance	STUDS	M^0_{Rks}	[Nm]	19	37	65	166
	STUDS-88			30	60	105	266
	STUDS-A4			26	52	92	233
Design bending moment	STUDS	M	[Nm]	11	21	37	95
	STUDS-88			17	34	60	152
	STUDS-A4			12	24	42	107

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Product information

Size	Product Code			Anchor		Fixture			
				Thread diameter	Length	Max. thickness			Hole diameter
						Solid substrates	Hollow substrates		
	Steel class 5.8	Steel class 8.8	Steel grade A4	d	L	$t_{fix,stnd}$	$t_{fix,stnd}$	$t_{fix,max}$	d_f
				[mm]	[mm]	[mm]			[mm]
M8	STUDS-08110	STUDS-08110-88	STUDS-08110-A4	8	110	20	50	15	9
	STUDS-08160	-	STUDS-08160-A4	8	160	70	100	65	9
M10	STUDS-10130	STUDS-10130-88	STUDS-10130-A4	10	130	33	33	-	12
	STUDS-10170	-	STUDS-10170-A4	10	170	73	73	33	12
	STUDS-10190	-	STUDS-10190-A4	10	190	93	93	53	12
M12	STUDS-12160	STUDS-12160-88	STUDS-12160-A4	12	160	50	60	20	14
	STUDS-12190	-	STUDS-12190-A4	12	190	80	90	50	14
	STUDS-12220	-	STUDS-12220-A4	12	220	110	120	80	14
	STUDS-12260	-	STUDS-12260-A4	12	260	150	160	120	14
	STUDS-12300	-	STUDS-12300-A4	12	300	190	200	160	14
M16	STUDS-16190	STUDS-16190-88	STUDS-16190-A4	16	190	66	86	-	18
	STUDS-16220	-	STUDS-16220-A4	16	220	96	116	-	18
	STUDS-16260	-	STUDS-16260-A4	16	260	136	156	-	18
	STUDS-16300	-	STUDS-16300-A4	16	300	176	196	-	18
	STUDS-16380	-	STUDS-16380-A4	16	380	256	276	-	18

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Basic performance data for single anchor

Performance data for single anchor without influence of edge distance and spacing.

Size	M8	M10	M12	M16	M8		M10		M12		M16
Mesh sleeve size	-	-	-	-	12 x 50	12 x 80	15 x 85	15 x 125	15 x 85	15 x 125	20 x 85
MEAN ULTIMATE LOAD											
TENSION AND SHEAR LOAD $F_{RU,m}$ [kN]											
SOLID SUBSTRATES											
Solid clay brick	8.8	12.1	14.3	16.3	-	-	-	-	-	-	-
Autoclaved aerated concrete	2.7	3.2	4.1	4.7	-	-	-	-	-	-	-
Solid silicate bricks	9.6	12.6	16.7	19.1	-	-	-	-	-	-	-
HOLLOW SUBSTRATES											
Silicate hollow blocks e.g. KS Ratio	-	-	-	-	3.4	3.5	3.7	5.1	4.2	4.5	4.2
Perforated ceramic blocks e.g. Poroton Hlz	-	-	-	-	3.3	3.5	4.5	5.0	5.2	5.8	5.8
Perforated ceramic blocks e.g. Wienerberger Porotherm	-	-	-	-	2.0	2.8	3.3	3.7	4.9	4.9	3.5
Perforated ceramic blocks e.g. Leier Thermopor	-	-	-	-	2.1	3.0	3.2	3.8	3.7	4.7	4.3
Perforated ceramic blocks e.g. Kozłowice MEGA-MAX	-	-	-	-	2.9	3.4	4.7	5.0	5.3	5.8	5.7
Perforated ceramic blocks e.g. LS Tableau Mono Rect	-	-	-	-	1.2	1.3	2.7	2.7	2.8	2.8	2.0
Perforated ceramic blocks e.g. LS Tableau Rect	-	-	-	-	1.6	1.6	2.4	2.5	2.6	2.7	2.1
Perforated ceramic blocks e.g. Monomur	-	-	-	-	1.3	1.4	2.0	2.1	2.1	2.1	2.1
Perforated ceramic blocks e.g. SM BGV Thermo	-	-	-	-	1.5	1.5	2.2	2.2	2.2	2.2	2.3
Perforated ceramic blocks e.g. SM BGV Thermo Plus	-	-	-	-	1.6	1.6	1.5	1.5	1.9	2.1	1.8
Lightweight concrete hollow blocks e.g. Hbl	-	-	-	-	1.7	2.4	3.5	3.3	3.9	4.8	5.3

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Basic performance data for single anchor (cont.)

Size	M8	M10	M12	M16	M8		M10		M12		M16
Mesh sleeve size	-	-	-	-	12 x 50	12 x 80	15 x 85	15 x 125	15 x 85	15 x 125	20 x 85
CHARACTERISTIC LOAD											
TENSION AND SHEAR LOAD F_{Rk}** [kN]											
SOLID SUBSTRATES											
Solid clay brick	6.0	7.0	7.0	7.0	-	-	-	-	-	-	-
Autoclaved aerated concrete	1.5	2.0	2.5	3.0	-	-	-	-	-	-	-
Solid silicate bricks	5.0	5.0	5.0	4.0	-	-	-	-	-	-	-
HOLLOW SUBSTRATES											
Silicate hollow blocks e.g. KS Ratio	-	-	-	-	2.5	2.5	2.5	3.5	3.0	3.0	3.0
Perforated ceramic blocks e.g. Poroton Hlz	-	-	-	-	2.0	2.5	3.0	3.5	3.5	4.0	4.0
Perforated ceramic blocks e.g. Wienerberger Porotherm	-	-	-	-	1.5	2.0	2.5	2.5	3.5	3.5	2.5
Perforated ceramic blocks e.g. Leier Thermopor	-	-	-	-	1.5	2.0	2.0	2.5	2.5	3.5	3.0
Perforated ceramic blocks e.g. Kozłowice MEGA-MAX	-	-	-	-	2.0	2.5	3.5	3.5	4.0	4.0	4.0
Perforated ceramic blocks e.g. LS Tableau Mono Rect	-	-	-	-	0.9	0.9	2.0	2.0	2.0	2.0	1.5
Perforated ceramic blocks e.g. LS Tableau Rect	-	-	-	-	1.2	1.2	1.5	1.5	2.0	2.0	1.5
Perforated ceramic blocks e.g. Monomur	-	-	-	-	0.9	0.9	1.5	1.5	1.5	1.5	1.5
Perforated ceramic blocks e.g. SM BGV Thermo	-	-	-	-	0.9	0.9	1.5	1.5	1.5	1.5	1.5
Perforated ceramic blocks e.g. SM BGV Thermo Plus	-	-	-	-	1.2	1.2	1.2	1.2	1.2	1.5	1.2
Lightweight concrete hollow blocks e.g. Hbl	-	-	-	-	1.2	1.5	2.5	2.5	2.5	2.5	2.5

**According to ETAG 029

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Basic performance data for single anchor (cont.)

Size	M8	M10	M12	M16	M8		M10		M12		M16
Mesh sleeve size	-	-	-	-	12 x 50	12 x 80	15 x 85	15 x 125	15 x 85	15 x 125	20 x 85
DESIGN LOAD											
TENSION AND SHEAR LOAD F_{Rd} [kN]											
SOLID SUBSTRATES											
Solid clay brick	2.4	2.8	2.8	2.8	-	-	-	-	-	-	-
Autoclaved aerated concrete	0.8	1.0	1.3	1.5	-	-	-	-	-	-	-
Solid silicate bricks	2.0	2.0	2.0	2.0	-	-	-	-	-	-	-
HOLLOW SUBSTRATES											
Silicate hollow blocks e.g. KS Ratio	-	-	-	-	1.0	1.0	1.0	1.4	1.2	1.2	1.2
Perforated ceramic blocks e.g. Poroton Hlz	-	-	-	-	0.8	1.0	1.2	1.4	1.4	1.6	1.6
Perforated ceramic blocks e.g. Wienerberger Porotherm	-	-	-	-	0.6	0.8	1.0	1.0	1.4	1.4	1.0
Perforated ceramic blocks e.g. Leier Thermopor	-	-	-	-	0.6	0.8	0.8	1.0	1.0	1.4	1.2
Perforated ceramic blocks e.g. Kozłowice MEGA-MAX	-	-	-	-	0.8	1.0	1.4	1.4	1.6	1.6	1.6
Perforated ceramic blocks e.g. LS Tableau Mono Rect	-	-	-	-	0.4	0.4	0.8	0.8	0.8	0.8	0.6
Perforated ceramic blocks e.g. LS Tableau Rect	-	-	-	-	0.5	0.5	0.6	0.6	0.8	0.8	0.6
Perforated ceramic blocks e.g. Monomur	-	-	-	-	0.4	0.4	0.6	0.6	0.6	0.6	0.6
Perforated ceramic blocks e.g. SM BGV Thermo	-	-	-	-	0.4	0.4	0.6	0.6	0.6	0.6	0.6
Perforated ceramic blocks e.g. SM BGV Thermo Plus	-	-	-	-	0.5	0.5	0.5	0.5	0.5	0.6	0.5
Lightweight concrete hollow blocks e.g. Hbl	-	-	-	-	0.5	0.6	1.0	1.0	1.0	1.0	1.0

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Size	M8	M10	M12	M16	M8		M10		M12		M16
Mesh sleeve size	-	-	-	-	12 x 50	12 x 80	15 x 85	15 x 125	15 x 85	15 x 125	20 x 85
RECOMMENDED LOAD											
TENSION AND SHEAR LOAD F_{Rec}* [kN]											
SOLID SUBSTRATES											
Solid clay brick	1,7	2,0	2,0	2,0	-	-	-	-	-	-	-
Autoclaved aerated concrete	0,5	0,7	0,9	1,1	-	-	-	-	-	-	-
Solid silicate bricks	1,4	1,4	1,4	1,4	-	-	-	-	-	-	-
HOLLOW SUBSTRATES											
Silicate hollow blocks e.g. KS Ratio	-	-	-	-	0,7	0,7	0,7	1,0	0,9	0,9	0,9
Perforated ceramic blocks e.g. Poroton Hlz	-	-	-	-	0,6	0,7	0,9	1,0	1,0	1,1	1,1
Perforated ceramic blocks e.g. Wienerberger Porotherm	-	-	-	-	0,4	0,6	0,7	0,7	1,0	1,0	0,7
Perforated ceramic blocks e.g. Leier Thermopor	-	-	-	-	0,4	0,6	0,6	0,7	0,7	1,0	0,9
Perforated ceramic blocks e.g. Kozłowice MEGA-MAX	-	-	-	-	0,6	0,7	1,0	1,0	1,1	1,1	1,1
Perforated ceramic blocks e.g. LS Tableau Mono Rect	-	-	-	-	0,3	0,3	0,6	0,6	0,6	0,6	0,4
Perforated ceramic blocks e.g. LS Tableau Rect	-	-	-	-	0,3	0,3	0,4	0,4	0,6	0,6	0,4
Perforated ceramic blocks e.g. Monomur	-	-	-	-	0,3	0,3	0,4	0,4	0,4	0,4	0,4
Perforated ceramic blocks e.g. SM BGV Thermo	-	-	-	-	0,3	0,3	0,4	0,4	0,4	0,4	0,4
Perforated ceramic blocks e.g. SM BGV Thermo Plus	-	-	-	-	0,3	0,3	0,3	0,3	0,3	0,4	0,3
Lightweight concrete hollow blocks e.g. Hbl	-	-	-	-	0,3	0,4	0,7	0,7	0,7	0,7	0,7

* Partial safety factor 1.4

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