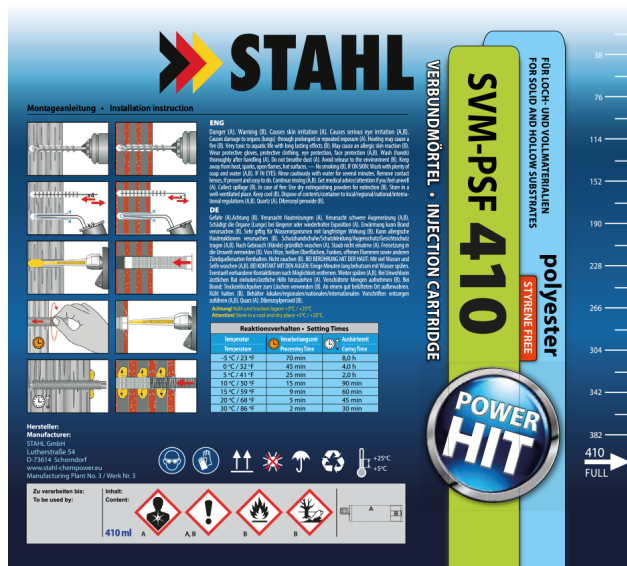


PSF-410 – Polyester resin for use in lightweight substrates

Bonded anchor with anchor rod made of galvanized steel or stainless steel of sizes M8 to M16 for use in lightweight and hollow substrates



Basic product information

Features

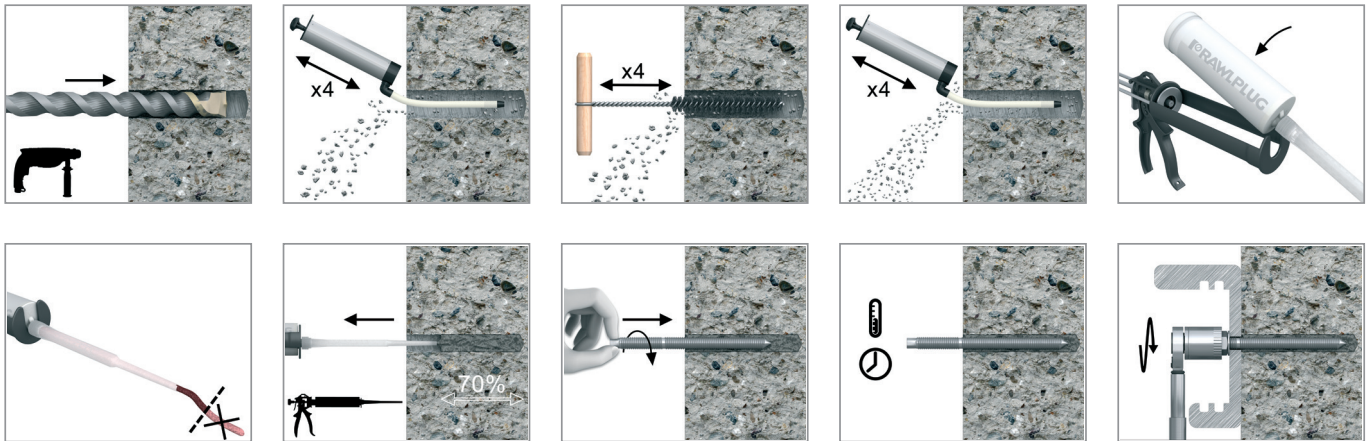
- Several embedment depths
- Styrene free resin (odorless)
- ETAG 001-5 Option 7
- **PSF-410** – 410ml
- **STUD** – carbon steel, class 5.8 acc. EN ISO 898-1
- **STUD-88** – carbon steel, class 8.8 acc. EN ISO 898-1
Coating thickness min. 5µm acc. EN ISO 4042
- **STUD-A4** – stainless steel, grade A4-70, A4-80 acc. EN ISO 3506
Steel material 1.4401, 1.4404, 1.4571 acc. EN 10088

Substrate

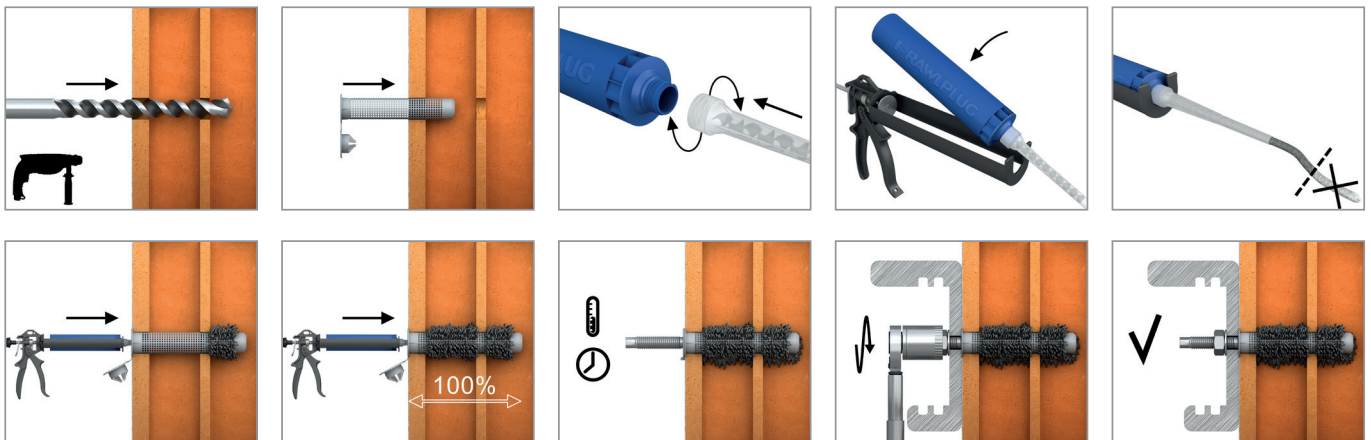
- Solid clay brick (e.g. Wienerberger Mz 20/2.0) 20N/mm²
- Autoclaved aerated concrete blocks AAC 7 6N/mm²
- Solid silicate bricks (e.g. KS NF 20/2.0) 20N/mm²
- Silicate hollow blocks (e.g. KS Ratio 8 DF 12/1.4) 12N/mm²
- Perforated ceramic blocks (e.g. Poroton Hlz 12/0.9 DF) 12N/mm²
- Perforated ceramic blocks (e.g. Wienerberger Porotherm 25 P+W) 15N/mm²
- Perforated ceramic blocks (e.g. Leier Thermopor 38 P+W) 10N/mm²
- Perforated ceramic blocks (e.g. Kozłowiec MEGA-MAX 250/238 P+W) 12N/mm²
- Perforated ceramic blocks (e.g. LS Tableau Mono Rect) 6N/mm²
- Perforated ceramic blocks (e.g. LS Tableau Rect) 6N/mm²
- Perforated ceramic blocks (e.g. Monomur 30) 6N/mm²
- Perforated ceramic blocks (e.g. SM BGV Thermo) 6N/mm²
- Perforated ceramic blocks (e.g. SM BGV Thermo Plus) 6N/mm²
- Lightweight concrete hollow blocks (e.g. Hbl) 2N/mm²

Installation guide

SOLID SUBSTRATES



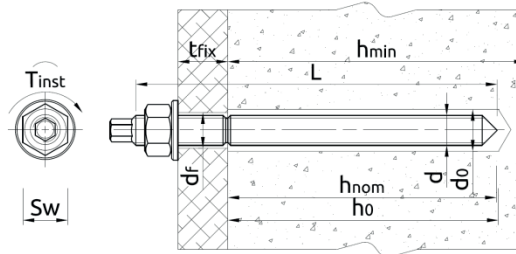
HOLLOW SUBSTRATES



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.

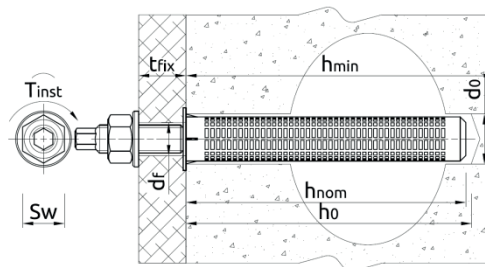
Installation data

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

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	-20	-		1080	-	-	30
5	-20	-		480	-	-	20
5	-20	1440	480	300	180	70	11
5	-20	1080	240	120	120	45	7
5	-20	720	120	60	60	25	5
10	-20	480	90	45	45	15	2
15	-20	360	60	30	25	9	1,5
20	-20	240	45	15	15	5	1
25	-20	90	30	-	7	2	-
25	-20	45	-	-	5	-	-

Mechanical properties

Size			M8	M10	M12	M16
STUDS Metric Threaded Rods - Steel Class 5.8						
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	400	400	400	400
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	19	37	65	166
Design bending resistance	M	[Nm]	15	30	52	133
Allowable bending resistance	M_{rec}	[Nm]	11	21	37	95
STUDS Metric Threaded Rods - Steel Class 8.8						
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	800	800	800	800
Nominal yield strength - tension	f_{yk}	[N/mm ²]	640	640	640	640
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	30	60	105	266
Design bending resistance	M	[Nm]	24	48	84	213
Allowable bending resistance	M_{rec}	[Nm]	17	34	60	152
STUDS Metric Threaded Rods - A4						
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	700	700	700	700
Nominal yield strength - tension	f_{yk}	[N/mm ²]	450	450	450	450
Cross sectional area - tension	A_s	[mm ²]	36.6	58	84.3	157
Elastic section modulus	W_{el}	[mm ³]	31.2	62.3	109.2	277.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	233
Design bending resistance	M	[Nm]	17	34	59	149
Allowable bending resistance	M_{rec}	[Nm]	12	24	42	107

Product information

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

Basic performance data for single anchor

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

Size		M8		M10		M12		M16	
Substrate type		-	Hollow substrates						
Plastic mesh sleeve size		[mm]	12x50	12x80	16x85	16x130	16x85	16x130	20x85
MEAN ULTIMATE LOAD									
TENSION AND SHEAR LOAD $F_{R,t,m}$									
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)		[kN]	3.42	3.50	3.73	5.11	4.16	4.48	4.24
Perforated ceramic blocks min 12MPa (eg Proton Hlz 12/0.9 DF)		[kN]	3.21	3.54	3.87	4.03	3.97	4.16	3.69
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)		[kN]	2.04	2.84	3.07	3.68	3.74	3.99	3.51
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)		[kN]	2.08	2.98	3.19	3.78	3.68	4.03	3.77
Perforated ceramic blocks min 15MPa (eg MEGA MAX)		[kN]	2.86	3.43	3.74	3.59	3.71	3.94	3.80
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)		[kN]	1.24	1.25	2.49	2.74	2.82	2.78	2.14
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)		[kN]	1.73	1.60	2.37	2.51	2.41	2.68	2.10
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)		[kN]	1.30	1.39	1.99	2.06	2.05	2.12	2.05
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)		[kN]	1.45	1.45	2.22	2.17	2.19	2.24	2.25
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)		[kN]	1.51	1.60	1.39	1.45	1.86	2.07	1.75
Lightweight concrete hollow block min 2.0MPa		[kN]	1.73	2.38	3.52	3.00	3.93	3.75	3.92
Substrate type		-	Hollow substrates						
Plastic mesh sleeve size		[mm]	12x50	12x80	16x85	16x130	16x85	16x130	20x85
MEAN ULTIMATE LOAD									
TENSION AND SHEAR LOAD $F_{R,k}$									
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)		[kN]	2.50	2.50	2.50	3.50	3.00	3.00	3.00
Perforated ceramic blocks min 12MPa (eg Proton Hlz 12/0.9 DF)		[kN]	2.00	2.50	2.50	2.50	2.50	2.50	2.50
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)		[kN]	1.50	2.00	2.00	2.50	2.50	2.50	2.50
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)		[kN]	1.50	2.00	2.00	2.50	2.50	2.50	2.50
Perforated ceramic blocks min 15MPa (eg MEGA MAX)		[kN]	2.00	2.50	2.50	2.50	2.50	2.50	2.50
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)		[kN]	0.90	0.90	1.50	2.00	2.00	2.00	1.20
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)		[kN]	0.90	1.20	1.50	1.50	1.50	2.00	1.50
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)		[kN]	0.90	0.90	1.20	1.50	1.50	1.50	1.50
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)		[kN]	0.90	0.90	1.50	1.50	1.50	1.50	1.50
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)		[kN]	0.90	1.20	0.90	0.90	1.20	1.50	1.20
Lightweight concrete hollow block min 2.0MPa		[kN]	1.20	1.50	2.50	2.00	2.50	2.50	2.50

Basic performance data for single anchor (cont.)

Size		M8	M10	M12	M16			
DESIGN LOAD								
TENSION AND SHEAR LOAD F_{Rd}								
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	1.00	1.00	1.00	1.40	1.20	1.20	1.20
Perforated ceramic blocks min 12MPa (eg Proton Hlz 12/0.9 DF)	[kN]	0.88	1.00	1.20	1.40	1.40	1.60	1.60
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	0.60	0.80	1.00	1.00	1.40	1.40	1.00
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	0.60	0.80	0.80	1.00	1.00	1.40	1.20
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	0.80	1.00	1.40	1.40	1.60	1.60	1.60
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	0.36	0.36	0.80	0.80	0.80	0.80	0.60
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	0.48	0.48	0.60	0.60	0.80	0.80	0.60
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	0.36	0.36	0.60	0.60	0.60	0.60	0.60
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	0.36	0.36	0.60	0.60	0.60	0.60	0.60
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	0.48	0.48	0.48	0.48	0.48	0.60	0.48
Lightweight concrete hollow block min 2.0MPa	[kN]	0.48	0.60	1.00	1.00	1.00	1.40	1.40
RECOMMENDED LOAD								
TENSION AND SHEAR LOAD F_{rec}								
Silicate hollow block min 12MPa (eg KS Ratio Block 8 DF)	[kN]	0.71	0.71	0.71	1.00	0.86	0.86	0.86
Perforated ceramic blocks min 12MPa (eg Proton Hlz 12/0.9 DF)	[kN]	0.63	0.71	0.86	1.00	1.00	1.14	1.14
Perforated ceramic blocks min 15MPa (eg Wienerberger Porotherm)	[kN]	0.43	0.57	0.71	0.71	1.00	1.00	0.71
Perforated ceramic blocks min 10MPa (eg Leiter Thermopor)	[kN]	0.43	0.57	0.57	0.71	0.71	1.00	0.86
Perforated ceramic blocks min 15MPa (eg MEGA MAX)	[kN]	0.57	0.71	1.00	1.00	1.14	1.14	1.14
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Mono Rect)	[kN]	0.26	0.26	0.57	0.57	0.57	0.57	0.43
Perforated ceramic blocks min 6.0MPa (eg LS Tableau Rect)	[kN]	0.34	0.34	0.43	0.43	0.57	0.57	0.43
Perforated ceramic blocks min 6.0MPa (eg LS Monomur)	[kN]	0.26	0.26	0.43	0.43	0.43	0.43	0.43
Perforated ceramic blocks min 6MPa (eg SM BGV Thermo)	[kN]	0.26	0.26	0.43	0.43	0.43	0.43	0.43
Perforated ceramic blocks min 6.0MPa (eg SM BGV Thermo Plus)	[kN]	0.34	0.34	0.34	0.34	0.34	0.43	0.34
Lightweight concrete hollow block min 2.0MPa	[kN]	0.34	0.43	0.71	0.71	0.71	1.00	1.00

Basic performance data for single anchor (cont.)

STUDS LIGHT

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

Size		M8	M10	M12	M16
Substrate type	-	Solid substrates			
Plastic mesh sleeve size	-	-	-	-	-
MEAN ULTIMATE LOAD					
TENSION LOAD $N_{Ru,m}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	8.78	10.9	11.3	11.5
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	2.65	3.24	4.11	4.68
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	7.54	8.00	8.30	8.50
SHEAR LOAD $V_{Ru,m}$					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	5.79	8.35	11.6	11.5
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	2.43	3.41	4.36	4.48
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	5.86	8.11	7.91	8.23
CHARACTERISTIC LOAD					
TENSION LOAD N_{Rk}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	6.00	7.00	7.00	7.00
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	1.50	2.00	2.50	3.00
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	5.00	5.00	5.00	5.00
SHEAR LOAD V_{Rk}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	3.50	5.00	7.00	7.00
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	1.50	2.00	2.50	2.50
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	3.50	5.00	5.00	5.00

Basic performance data for single anchor (cont.)

Size		M8	M10	M12	M16
DESIGN LOAD					
TENSION LOAD N_{Rd}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	2.40	2.80	2.80	2.80
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.75	1.00	1.25	1.50
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	2.00	2.00	2.00	2.00
SHEAR LOAD V_{Rd}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	1.40	2.00	2.80	2.80
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.75	1.00	1.25	1.25
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	1.40	2.00	2.00	2.00
RECOMMENDED LOAD					
TENSION LOAD N_{rec}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	1.71	2.00	2.00	2.00
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.54	0.71	0.89	1.07
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	1.43	1.43	1.43	1.43
SHEAR LOAD V_{rec}					
Solid clay brick min 20MPa (eg Mz20/2.0)	[kN]	1.00	1.43	2.00	2.00
Autoclaved aerated concrete block min 6.0MPa (AAC7)	[kN]	0.54	0.71	0.89	0.89
Solid silicate brick min 20MPa (eg KS NF 20/2.0)	[kN]	1.00	1.43	1.43	1.43