CHEMFIX Vinyl eco / EASF

Features and Benefits

Version: 10/01/2025

- *High bond strength with High load resistance*
- *Used with all grades of threaded rod and rebar*
- *Used in concrete and masonry*
- *Fast gelling and curing*
- *Used in dry/wet concrete and flooded holes*
- *Resistance to chemicals and damp conditions*
- *Close edge distance and small spacing*
- *European approval for use in masonry with nylon sleeves*
- *Economical fixing resin*
- *Extremely versatile*
- *Styrene free with low odour*
- *Manual cleaning up to 20mm diameter and embedment depths of 240mm*
- *Independently tested and approved*
- *Used for the installation of Solar Panels*

Contents

Shelf Life and Storage

This product should be stored between +5˚C & +25˚C.
The Shelf life of the product is 18 months from the manufacture date.

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Product Description

Chemfix Vinyl eco / EASF is a 2 component high strength 10:1 ratio chemical anchoring resin system. It is designed as a fast curing high strength resin fixing anchor for high loads and medium loads and is particularly advantageous for fixings in damp environments or with chemical exposure.

Available in sizes : 165/300ml Foil Bag 10:1, 345/825ml Side By Side and 400/410ml Coaxial Cartridges

Specific Benefits

- European Approved
- High loads possible
- Chemical resistance
- Studs and rebar
- Approved for Masonry
- Styrene Free Low odour
- Economical fixing resin

Approvals

- ETA - EAD 330499 for non-cracked concrete
- ETA - EAD 330076 for solid and hollow masonry
- Tested according to LEED 2021 EQ c4.1, SCAQMD rule 1168 (2017).
- A+ Rating VOC content
- VOC Emission Test Report - Indoor Air Comfort GOLD®

Loads, Edge and Spacings based on Characteristic bond strengths - Showing steel failure

	Characteristic Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Characteristic distances (mm)			Min Edge and Spacing (mm)				
Size (mm)	Tension N_{rk}	Shear V_{rk}	Tension N_{rd}	Shear V_{rd}	Tension N_{rec}	Shear V_{rec}	Edge $C_{cr,N}$	Spacing $S_{cr,N}$	Edge $C_{cr,V}$	C_{min}, S_{min}	Nominal Embedment (mm)	Hole Diameter concrete (mm)	Hole Diameter fixture (mm)	Max Torque (Nm)
8	15.15		10.10		7.21						60			
	19.00	9.00	12.70	7.20	9.07	5.14	80	160	80	40	80	10	9	10
	19.00		12.70		9.07						160			
10	18.90		12.60		9.00						60			
	28.35	15.00	18.90	12.00	13.50	8.57	100	200	90	50	90	12	12	20
	30.20		20.10		14.36						200			
12	25.35		16.90		12.07						70			
	39.75	21.00	26.50	16.80	18.93	12.00	120	240	110	60	110	14	14	40
	43.80		29.20		20.86						240			
16	33.00		22.00		15.71						80			
	51.60	39.00	34.40	31.20	24.57	22.29	160	320	125	80	125	18	18	80
	81.60		54.40		38.86						320			
20	31.50		21.00		15.00						90			
	87.75	61.00	58.50	48.80	41.79	34.86	200	400	180	100	170	22	22	120
	127.40		84.90		60.64						400			
24	59.25		39.50		28.21						100			
	124.35	88.00	82.90	70.40	59.21	50.29	240	480	220	120	210	28	26	160
	183.60		122.40		87.43						480			
27	66.60		44.40		31.71						110			
	145.50	115.00	97.00	92.00	69.29	65.71	270	540	240	135	240	30	30	180
	238.00		159.10		113.64						540			
30	72.75		48.50		34.64						120			
	169.65	142.50	113.10	114.00	80.79	81.43	280	560	280	150	280	35	32	200
	292.00		194.50		138.93						600			

= steel failure Partial safety factor = 1.5

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Design Resistance used with various stud strengths, material and rebar.

5.8 Grade Steel Studding

Stud Diameter	Hole Diameter	Embedment Depth hef																		h_{ef} failure	$F_{d,s}$ design load
(mm)	(mm)	60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	(mm)	(kN)
8	10	10.1	11.7	12.7																76	12.7
10	12	12.6	14.7	16.8	18.9	20.1														96	20.1
12	14		16.9	19.3	21.7	24.1	26.5	28.9	29.2											121	29.2
16	18			22.0	24.8	27.5	30.3	33.0	35.8	38.5	44.0	54.4								198	54.4
20	22			27.5	31.0	34.4	37.9	41.3	44.7	48.2	55.1	68.8	82.6	84.9						247	84.9
24	28					39.5	43.4	47.4	51.3	55.3	63.2	79.0	94.8	110.6	122.4					310	122.4
27	30						44.4	48.5	52.5	56.6	64.6	80.8	97.0	113.1	129.3	159.1				394	159.1
30	35							48.5	52.5	56.6	64.6	80.8	97.0	113.1	129.3	161.6	193.9	194.5		481	194.5
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600		

steel failure

8.8 Grade Steel Studding

Stud Diameter	Hole Diameter	Embedment Depth hef																		h_{ef} failure	$F_{d,s}$ design load
(mm)	(mm)	60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	(mm)	(kN)
8	10	101.0	11.7	13.4	15.1	16.8	18.4	19.5												116	19.5
10	12	12.6	14.7	16.8	18.9	20.9	23.0	25.1	27.2	29.3	30.9									148	30.9
12	14		16.9	19.3	21.7	24.1	26.5	28.9	31.3	33.7	38.5	45.0								187	45.0
16	18			22.0	24.8	27.5	30.3	33.0	35.8	38.5	44.0	55.1	66.1	77.1	83.7					304	83.7
20	22			27.5	31.0	34.4	37.9	41.3	44.7	48.2	55.1	68.8	82.6	96.4	110.1	130.7				380	130.7
24	28					39.5	43.4	47.4	51.3	55.3	63.2	79.0	94.8	110.6	126.4	158.0	188.3			477	188.3
27	30						44.4	48.5	52.5	56.6	64.6	80.8	97.0	113.1	129.3	161.6	193.9	218.1		606	244.8
30	35							56.6	61.3	66.0	75.4	94.3	113.1	132.0	150.8	188.5	226.2	218.1	242.4	741	299.2
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600		

= steel failure

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Design Resistance used with various stud strengths, material and rebar.

10.9 Grade Steel Studding

Stud Diameter	Hole Diameter	Embedment Depth hef																		h_{ef} failure	$F_{d,s}$ design load
(mm)	(mm)	60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	(mm)	(kN)
8	10	10.1	11.7	13.4	15.1	16.8	18.4	20.1	21.8	23.5	27.2									162	27.2
10	12	12.6	14.7	16.8	18.9	20.9	23.0	25.1	27.2	29.3	33.5	43.1								206	43.1
12	14		16.9	19.3	21.7	24.1	26.5	28.9	31.3	33.7	38.5	48.2	57.8							260	62.6
16	18			22.0	24.8	27.5	30.3	33.0	35.8	38.5	44.0	55.1	66.1	77.1	88.1					424	116.6
20	22			27.5	31.0	34.4	37.9	41.3	44.7	48.2	55.1	68.8	82.6	96.4	110.1	137.6				529	182.0
24	28					39.5	43.4	47.4	51.3	55.3	63.2	79.0	94.8	110.6	126.4	158.0	189.6			664	262.2
27	30						44.4	48.5	52.5	56.6	64.6	80.8	97.0	113.1	129.3	161.6	193.9	218.1		844	341.0
30	35							48.5	52.5	56.6	64.6	80.8	97.0	113.1	129.3	161.6	193.9	218.1	242.4	1032	416.7
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600		

A4-70 Stainless Steel Studding

Stud Diameter	Hole Diameter	Embedment Depth hef													steel failure					h_{ef} failure	$F_{d,s}$ design load
(mm)	(mm)	60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	(mm)	(kN)
8	10	10.1	11.7	13.7																82	13.7
10	12	12.6	14.7	16.8	18.9	21.7														104	21.7
12	14		16.9	19.3	21.7	24.1	26.5	28.9	31.6											131	31.6
16	18			22.0	24.8	27.5	30.3	33.0	35.8	38.5	44.0	55.1	58.8							213	58.8
20	22			27.5	31.0	34.4	37.9	41.3	44.7	48.2	55.1	68.8	82.6	91.7						267	91.7
24	28					39.5	43.4	47.4	51.3	55.3	63.2	79.0	94.8	110.6	126.4	132.1				355	132.1
27	30						44.4	48.5	52.5	56.6	64.6	80.2							1	199	80.2
30	35							48.5	52.5	56.6	64.6	80.8	97.0	98.1					1	243	98.1
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600		

Notes

1 Tensile strength 500N/mm2

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Design Resistance used with various stud strengths, material and rebar.

A4-80 Stainless Steel Studding

Stud Diameter	Hole Diameter	Embedment Depth hef																		h_{ef} failure	$F_{d,s}$ design load
(mm)	(mm)	60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	(mm)	(kN)
8	10	10.1	11.7	13.4	15.7															93	15.7
10	12	12.6	14.7	16.8	18.9	20.9	23.0	24.8												118	24.8
12	14		16.9	19.3	21.7	24.1	26.5	28.9	31.3	33.7	36.1									150	36.1
16	18			22.0	24.8	27.5	30.3	33.0	35.8	38.5	44.0	55.1	67.2							244	67.2
20	22			27.5	31.0	34.4	37.9	41.3	44.7	48.2	55.1	68.8	82.6	96.4	104.8					304	104.8
24	28					39.5	43.4	47.4	51.3	55.3	63.2	79.0	94.8	110.6	126.4	132.1			2	335	132.1
27	30						44.4	48.5	52.5	56.6	64.6	80.2							1	199	80.2
30	35							48.5	52.5	56.6	64.6	80.8	97.0	98.1					1	243	98.1
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600		

High bond reinforcing bars Fyk=500N/mm2

Rebar Diameter	Hole Diameter	Embedment Depth hef																		h_{ef} failure	$F_{d,s}$ yield load
(mm)	(mm)	60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	500	560	640	(mm)	(kN)
8	10	8.4	9.8	11.2	12.6	14.0	15.4	16.8	18.2	19.6	21.9									157	21.9
10	12	10.5	12.2	14.0	15.7	17.5	19.2	20.9	22.7	24.4	27.9	34.1								196	34.1
12	14		14.7	16.8	18.9	20.9	23.0	25.1	27.2	29.3	33.5	41.9	49.5							235	49.2
16	20			17.2	19.4	21.5	23.7	25.9	28.0	30.2	34.5	43.1	51.7	60.3	68.9					406	87.4
20	25			21.5	24.2	26.9	29.6	32.3	35.0	37.7	43.1	53.9	64.6	75.4	86.2	107.7				507	136.6
25	30					33.7	37.0	40.4	43.8	47.1	53.9	67.3	80.8	94.3	107.7	134.7	168.3			634	196.5
28	35						39.2	42.7	46.3	49.9	57.0	71.2	85.5	99.7	113.9	142.4	178.0	199.4		752	267.8
32	40								49.3	53.6	61.3	76.6	91.9	107.2	122.6	153.2	191.5	214.5	245.1	913	349.7
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	500	560	640		

*1 = Tensile strength 500N/mm2

*2 = Tensile strength 700N/mm2

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Bond Strength Factors

Influence of concrete strength on combined pull out and concrete cone resistance

Concrete Strength N/mm2	C15/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Non-Cracked fc =	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Influence of environmental conditions in non cracked concrete

		M8	M10	M12	M16	M20	M24	M30
Temp I 40°C / 24°C	Dry and Wet	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Temp II 80°C / 50°C	Dry and Wet	0.70	0.70	0.70	0.70	0.70	0.70	0.70

Select concrete strength and environmental condition and apply to bond strength table on pages 3 to 5

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Material Properties for grades of threaded rod and rebar

	Stud Grade 8.8		Stud Grade 10.9		Stud Grade A4-70		Stud Grade A4-80	
Stud Diameter	$N_{rk,\,s}$	$N_{rd,\,s}$	$N_{rk,\,s}$	$N_{rd,\,s}$	$N_{rk,\,s}$	$N_{rd,\,s}$	$N_{rk,\,s}$	$N_{rd,\,s}$
(mm)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)
M8	29.3	19.5	38.1	27.2	25.6	13.7	29.2	15.6
M10	46.4	30.9	60.3	43.1	40.6	21.7	46.4	24.8
M12	67.5	45.0	87.7	62.6	59.0	31.6	67.4	36.1
M16	125.6	83.7	163.2	116.6	109.9	58.8	125.7	67.2
M20	196.1	130.7	254.8	182.0	171.5	91.7	196.0	104.8
M24	282.5	188.3	367.1	262.2	247.1	132.1	293.0	132.1
M30	448.8	299.2	583.4	416.7	280.5	150.0	392.7	210.0

	Stud Grade 8.8		Stud Grade 10.9		Stud Grade A4-70		Stud Grade A4-80	
Stud Diameter	$V_{rk,\,s}$	$V_{rd,\,s}$	$V_{rk,\,s}$	$V_{rd,\,s}$	$V_{rk,\,s}$	$V_{rd,\,s}$	$V_{rk,\,s}$	$V_{rd,\,s}$
(mm)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)
M8	14.6	11.7	19.0	15.2	12.8	8.2	14.6	9.4
M10	23.2	18.6	30.2	24.1	20.3	13.0	23.2	14.9
M12	33.7	27.0	43.8	35.1	29.5	18.9	33.7	21.6
M16	62.8	50.2	81.6	65.3	55.0	35.2	62.8	40.3
M20	98.0	78.4	127.4	101.9	85.8	55.0	98.0	62.8
M24	141.2	113.0	183.6	146.8	123.6	79.2	141.2	90.5
M30	224.4	179.5	291.5	215.9	140.3	89.9	196.4	125.9

	Rebar BSt 500 to DIN 488		Rebar BSt 500 to DIN 488	
Rebar Diameter	$N_{rk,\,s}$	$N_{rd,\,s}$	$V_{rk,\,s}$	$V_{rd,\,s}$
(mm)	(kN)	(kN)	(kN)	(kN)
8	28.0	20.0	14.0	9.3
10	43.0	30.7	21.5	14.3
12	62.0	44.3	31.0	20.7
16	111.0	79.3	55.5	37.0
20	173.0	123.6	86.5	57.7
25	270.0	192.8	135.0	90.0
28	339.0	242.1	169.0	112.7
32	442.0	315.7	221	147.3

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Bond Strength Factors - REBAR

Influence of concrete strength on combined pull out and concrete cone resistance

Concrete Strength N/mm2	C15/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
non-cracked fc =	0.97	1.00	1.03	1.06	1.09	1.12	1.16	1.20

Influence of environmental conditions in non cracked concrete

		Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 18	Ø 20	Ø 22	Ø 25	Ø 28	Ø 32
Temp I 40°C / 24°C	Dry and Wet	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Temp II 80°C / 50°C	Dry and Wet	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70

Select concrete strength and environmental condition and apply to bond strength table on page 5

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Typical Performance in Aerated Concrete

Characteristic values of resistance under tension & shear loads for Autoclaved Aerated Concrete.
Compresive strength of material fb > 6MPa Temp range -40 to +40 C degree. Vinylester ECO.

Size	Condition :	d/d	w/w & w/d	d/d, w/w & w/d
	Hef (mm)	Tension (kN)	Tension (kN)	Shear (kN)
M8	80	2.0	1.5	5
M10	90	3.0	2.5	8
M12	100	4.0	3.5	8
M16	100	5.5	4.5	8

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Effect of Anchor Spacing - Tension

Anchor Spacing	Stud / Rebar Diameter						
(mm)	8	10	12	16	20	24	30
40	0.64						
50	0.67	0.63					
60	0.70	0.65	0.63				
70	0.73	0.67	0.64				
80	0.76	0.69	0.66	0.63			
90	0.79	0.72	0.68	0.64			
100	0.82	0.74	0.70	0.65	0.63		
120	0.87	0.79	0.74	0.68	0.65	0.63	
150	0.96	0.86	0.80	0.73	0.68	0.65	0.63
160	1.00	0.88	0.82	0.74	0.70	0.66	0.63
175		0.92	0.85	0.76	0.71	0.67	0.64
200		1.00	0.90	0.80	0.74	0.69	0.66
225			0.95	0.84	0.77	0.72	0.68
240			1.00	0.86	0.79	0.73	0.69
250				0.87	0.80	0.74	0.70
275				0.91	0.83	0.76	0.72
280				0.92	0.84	0.77	0.73
300				0.95	0.86	0.79	0.74
320				1.00	0.88	0.81	0.76
350					0.92	0.83	0.78
400					1.00	0.88	0.82
440						0.92	0.85
460						1.00	0.87
500							0.90
560							1.00

Effect of Edge Distance - Tension

Edge Distance	Stud / Rebar Diameter						
(mm)	8	10	12	16	20	24	30
40	0.64						
50	0.73	0.63					
60	0.82	0.70	0.63				
70	0.90	0.77	0.68				
80	1.00	0.84	0.74	0.63			
90		0.91	0.80	0.67			
100		1.00	0.86	0.71	0.63		
110			0.92	0.76	0.66		
120			1.00	0.80	0.70	0.64	
140				0.89	0.77	0.67	0.63
160				1.00	0.84	0.72	0.65
180					0.91	0.78	0.70
200					1.00	0.84	0.76
220						0.89	0.81
240						1.00	0.86
280							1.00

Effect of Edge Distance - Shear

Edge Distance	Stud / Rebar Diameter						
(mm)	8	10	12	16	20	24	30
40	0.25						
50	0.44	0.30					
60	0.63	0.48	0.30				
70	0.81	0.65	0.44				
80	1.00	0.83	0.58	0.40			
90		1.00	0.72	0.53			
100			0.86	0.67	0.35		
110			1.00	0.80	0.44		
125				1.00	0.58	0.35	
140					0.72	0.46	0.30
160					0.91	0.62	0.35
180					1.00	0.77	0.46
200						0.92	0.57
220						1.00	0.68
240							0.78
280							1.00

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Minimum Curing Time

Concrete Temperature	Gel - Working Time	Minimum curing time in dry concrete	Minimum curing time in wet concrete
-10°C ≤ Tbase material < 0°C	40 min	10 h	x2
0°C ≤ Tbase material < 10°C	20 min	90 min	x2
10°C ≤ Tbase material < 20°C	9 min	60 min	x2
20°C ≤ Tbase material < 30°C	5 min	30 min	x2
30°C ≤ Tbase material < 40°C	3 min	20 min	x2

* Resin temperature must be at least 20°C

- All specifications based on supplied mixer

Temperature Ranges

Temperature Range	Concrete Service Temperature	Maximum Long Term Concrete Temp	Maximum Short Term Concrete Temp
Range I	-40°C to +40°C	+24°C	+40°C
Range II	-40°C to +80°C	+50°C	+80°C

Service temperature range: Range of ambient temperatures after installation and during the lifetime of the anchor.

Short term temperature: Temperatures within the service temperature range which vary over short intervals,

e.g. day/night cycles and freeze/thaw cycles.

Long term temperature: Temperature, within the service temperature range, which will be approximately constant

over significant periods of time.

Long term temperatures will include constant or near constant temperatures, such as those experienced in cold stores or next to heating installations.

Physical Properties

	N/mm2	Test Method
Compresive Strength	**55**	
Flexural Strength	20.8	EN ISO 178 / ASTM 790
Flexural Modulus	4000	EN ISO 178 / ASTM 790
Tensile Strength	15	EN ISO 527 / ASTM 638
VOC Content	A+ Rating	-

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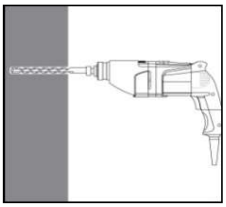
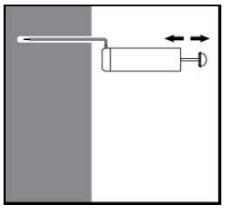
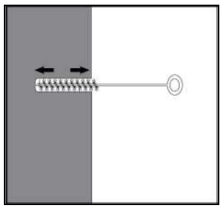
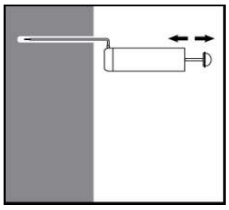
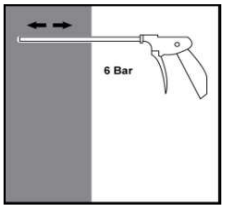
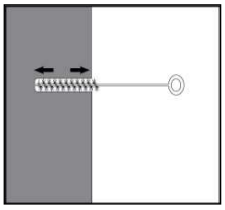
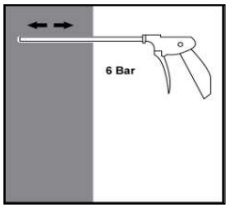
Installation parameters: drilling hole cleaning and installation

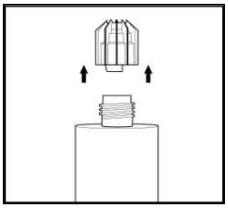
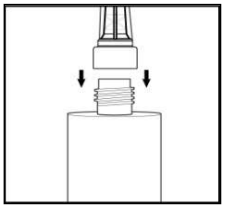
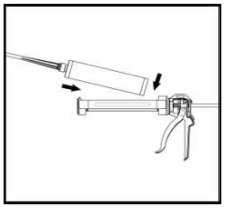
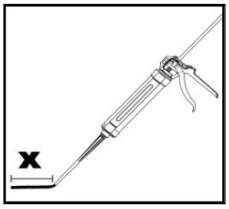
Drill hole in the substrate to the required embedment depth using the appropriately sized carbide drill bit. Bore hole cleaning Just before setting an anchor, the bore hole must be free of dust and debris. The manual pump shall be used for blowing out bore holes up to diameters do ≤ 24mm and embedment depths up to hef ≤ 10d. Blow out at least 4 times from the back of the bore hole, using an extension if needed. Brush 4 times with the specified brush size (see Table 6) by inserting the steel brush to the back of the hole (if needed with an extension) in a twisting motion and removing it. Blow out again with manual pump at least 4 times.

Compressed air cleaning (CAC) for all bore hole diameters do and all bore hole depths

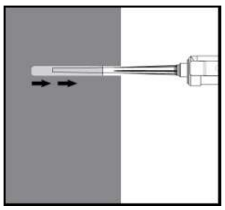
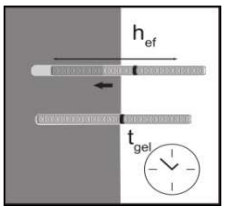


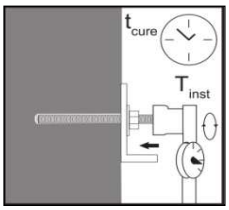



Blow 2 times from the back of the hole (if needed with a nozzle extension) over the whole length with oil-free compressed air (min. 6 bar at 6 m³/h). Brush 2 times with the specified brush size (see Table 6) by inserting the steel brush to the back of the hole (if needed with an extension) in a twisting motion and removing it.
X 2 Blow out again with compressed air at least 2 times.

Remove the threaded cap from the cartridge. Tightly attach the mixing nozzle. Do not modify the mixer in any way. Made sure the mixing element is inside the mixer. Use only the supplied mixer. Insert the cartridge into the dispenser gun. Discard the initial trigger pulls of adhesive. Discard the first 10ml of resin.



Inject the adhesive starting at the back of the hole, slowly withdrawing the mixer with each trigger pull. Fill holes approximately 2/3 full, to ensure that the annular gap between the anchor and the concrete is completely filled with adhesive along the embedment depth. Before use, verify that the threaded rod is dry and free of contaminants. Install the threaded rod to the required embedment depth during the open gel time tgel has elapsed. The working time tgel is given in Table 7. The anchor can be loaded after the required curing time tcure (see Table 7). The applied torque shall not exceed the values Tmax given in Table 1.

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Characteristic and recommended loads for masonry:

The design details are fully disclosed in the ETA. The recommended load are valid under the following conditions:

- dry environment
- masonry mortar class more than M2.5
- space distance s ≥ s_{cr}
- edge distance c ≥ c_{cr}
- joints (vertical and horizontal) are visible and filled with mortar
- no pre-stressing force on the wall
- steel strength of anchor 5.8 or higher
- no interaction of tension and shear loads considered
- temperature range from -40 to +40°C

Brick type and strength: solid clay brick with compressive strength ≥ 18 Mpa Bulk density 1,60 kg/dm3

Brick "Mattone Pieno"			**M6**	**M8**	**M10**	**M12**
Anchorage depth	h_{ef}	mm	80	80	85	85
Drill diameter (hole diameter)	d_0	mm	8	10	12	14
Minimum wall thickness	h_{min}	mm	h_{ef} + 5mm			
Minimal space distance	s_{min}	mm	240		255	
Minimal edge distance	c_{min}	mm	120		127.5	
Critical space distance	$s_{cr,N}$	mm	240		255	
Critical edge distance	$c_{cr,N}$	mm	120		127.5	
Installation torque	T_{ins}	Nm	1			
Characteristic tension load	N rk	kN	4	4	5	5
Recommended tension load	N rec	kN	1,14		1,43	
Characteristic shear load	V rk	kN	2	2	6	6
Recommended shear load	V rec	kN	0,57		1,71	

Brick type and strength: hollow brick - compressive strength ≥ 6 Mpa Bulk density 0,9 kg/dm3

Brick "Doppio UNI"			**M6**	**M8**	**M10**	**M12**
Sleeve dimention (nylon or plastic)		mm	12 x 80		16 x 85	
Anchorage depth	h_{ef}	mm	80	80	85	85
Drill diameter (hole diameter)	d_0	mm	12	12	16	16
Minimum wall thickness	h_{min}	mm	h_{ef} + 5mm			
Critical space distance parallel to horizontal j	$s_{cr,\|\|}$	mm	250	250	250	250
Critical space distance perpendicular to horiz	$s_{cr,\perp}$	mm	120	120	120	120
Minimal space distance parallel to horizontal	$s_{min,\|\|}$	mm	250			
Minimal space distance perpendicular to hor	$s_{min,\perp}$	mm	120			
Critical edge distance	c_{cr}	mm	100	100	100	100
Minimal edge distance	c_{min}	mm	100			
Installation torque	T_{ins}	Nm	2			
Characteristic tension load	N rk	kN	0,75	0,75	1,5	1,5
Recommended tension load	N rec	kN	0,21		0,43	
Characteristic shear load	V rk	kN	1,5	1,5	1,5	1,5
Recommended shear load	V rec	kN	0,43			

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Properties for installation in vary type of wood

Wood Type	Bar size	Hole size [mm]	Embedment depth [mm]	Characteristic Tension Load [kN]	Characteristic Bond strength [MPa]
OAK	M8	10	60	9	6.0
Glulam spruce	M12	16	120	27	6.0
Glulam spruce	M16	19/20	150	45	6.0

Wood Type	Bar size	Hole size [mm]	*Load for 60mm embedment depth [kg]	*Load for 120 mm embedment depth [kg]	*Load for 150 mm embedment depth [kg]
OAK	M8	10	918	1836	2295
Glulam spruce	M12	16	1377	2754	3443
Glulam spruce	M16	19/20	1836	3672	4590

*** Note:**
The load is in function of the embedment depth and should be factored down with a safety factor (≥4)

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Notes

PAGE 2 :

Typical characteristic and design resistance performance with 5.8 grade studding and associated installation data

All data is based on correct installation - see instructions

No influence of edge and spacing

Minimum base material thickness hef +30mm >100mm for M8 to M12 and for M16 to M30 hef +2 d

h_{ef} range minimum or 4d whichever is greatest to 20d

Concrete strength C20/25 - f_c cube = 25N/mm^2 (25MPa)

5.8 grade stud

Temperature range I maximum long term / short term temperature +24/40^{o}C

PAGE 3 to 5

Design Resistance with various stud strengths, material and rebar.

Note 1 for stainless steel tensile strength is 500N/mm^2 (500MPa)

Note 2 for stainless steel tensile strength is 700N/mm^2 (500MPa)

Data shown below the minimum embedment depth is for reference only. Please refer to manufacturer for advice.

PAGE 6 & 8:

Bond Strength Factors

Select concrete strength and environmental condition and apply to bond strength table on page 6 for threaded bars or 8 for rebar

PAGE 7 :

Material Properties for grades of other threaded rod and rebar

All grades shown for information

M30 studding is 8.8 grade instead of 5.8 grade

M30 for A4-70 tensile strength of 500N/mm2 (500MPa), instead of 700N/mm2 (700MPa)

Safety factor is 1.5 tension and 1.25 shear for all carbon steel except 10.9 grade which is 1.4 for tension

Safety factor is 1.87 for stainless steel, up to M24, M27 and M30 is

Safety factor is 1.4 tension and 1.5 shear for BSt 500 rebar

Partial Safety Factors for pages 2,3,4,5:

1.8 for all sizes studs

1.8 for all sizes rebar

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