SAXON PAINTS.

Epoxy No:5

Features and Benefits

Version: - 12/11/2020

- *High bond strength with High load resistance*
- *Use with all grades of threaded rod and rebar*
- *For deep embedment installations*
- *Longer gelling times for large holes*
- *Used in dry and wet concrete and also in wood*
- *Used in flooded holes*
- *Used in corrosive environments*
- *Suitable for diamond drilled holes*
- *Used for elevated temperatures - temperature ranges I, II and III*
- ***European Approval TR023 for rebar installations***
- *Low shrinkage enables large diameter installations*
- *Close edge distance and small spacing*
- *Manual cleaning up to 20mm diameter and embedment depths of 240mm*
- *Independently tested and approved*

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Shelf Life and Storage

This product should be stored between +5˚C & +25˚C.
The Shelf life of the product is 24 months from the manufacture date.

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Epoxy No:5

Product Description

Epoxy No.5 is a Pure Epoxy is a 2 component high strength pure epoxy chemical anchoring resin system. It is designed for deep embedment and large diameter holes due to its zero shrinkage, and longer working times. For diamond drilled holes, with rebar, and in areas of high chemical exposure eg. Seasalt and swimming pools.

Specific Benefits Approvals

- Long working times
- High loads possible
- High chemical resistance
- Use with potable water
- Studs and rebar
- Diamond drilled holes
- Fixing studs in wood
- Zero shrinkage
- Low odour
- 24 Month shelf life
- European Approval 15/0255 for Post-Installed Rebar TR023
- Tested to BS6920 for use with potable water* (Cured at 7°C for 7 days)
- Tested according to LEED 2009 EQ c4.1, SCAQMD rule 1168 (2005).
- A+ Rating VOC content
- R240 Fire Tested

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

	Characteris c Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Characteris c distances (mm)			Min Edge and Spacing (mm)				
Size (mm)	Tension	Shear	Tension	Shear	Tension	Shear	Edge	Spacing	Edge		Nominal Embedment (mm)	Hole Diameter concrete (mm)	Hole Diameter fixture (mm)	Max Torque (Nm)
	N_{rk}	V_{rk}	N_{rd}	V_{rd}	N_{rec}	V_{rec}	$C_{cr,N}$	$S_{cr,N}$	$C_{cr,V}$	C_{min}, S_{min}				
8	19.00		12.70		9.07						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	25.45		14.14		10.10						60			
	30.20	15.00	20.10	12.00	14.36	8.57	100	200	90	50	90	12	12	20
	30.20		20.10		14.36						200			
12	35.63		19.79		14.14						70			
	43.80	21.00	29.20	16.80	20.86	12.00	120	240	110	60	110	14	14	40
	43.80		29.20		20.86						240			
16	52.28		29.04		20.74						80			
	81.60	39.00	54.40	31.20	38.86	22.29	160	320	175	80	125	18	18	80
	81.60		54.40		38.86						320			
20	67.86		32.31		23.08						90			
	126.70	61.00	60.30	48.80	43.07	34.86	200	400	225	100	170	22	22	120
	127.40		84.90		60.64						400			
24	82.94		39.49		28.21						100	28	26	160

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	174.17	88.00	82.94	70.40	59.24	50.29	240	480	280	120	210			
	183.60		122.40		87.43						480			
	102.64		48.87		34.91						110			
27	223.93	115.00	106.63	92.00	76.17	65.71	270	540	240	135	240	30	30	180
	238.00		159.10		109.50						540			
	124.41		59.24		42.32						120			
30	290.28	142.50	138.23	114.00	98.74	81.43	300	600	280	150	280	35	32	200
	292.00		194.50		133.33						600			
	141.51		67.39		48.13						130			
33	326.57	173.50	155.51	138.80	111.08	99.14	330	660	310	165	300	37	36	250
	360.00		240.60		165.23						660			
	169.65		80.78		57.70						150			
36	384.53	212.50	183.10	170.00	130.79	121.43	360	720	330	180	340	40	38	300
	425.00		283.33		202.38						720			

= steel failure **Table notes** : see back page

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	660	720	(mm)	(kN)
8	10	11.3	12.7																			67	12.7
10	12	14.1	16.5	18.9	20.1																	85	20.1
12	14		19.8	22.6	25.5	28.3	29.2															103	29.2
16	18			29.0	32.7	36.3	39.9	43.6	47.2	50.8	54.4											150	54.4
20	22			30.4	34.2	38.0	41.8	45.6	49.4	53.2	60.8	76.0	84.9									223	84.9
24	28					39.5	43.5	47.4	51.4	55.3	63.2	79.0	94.8	110.6	122.4							310	122.4
27	30						48.9	53.3	57.8	62.2	71.1	88.9	106.7	124.5	142.2	159.1						358	159.1
30	35							59.3	64.2	69.1	79.0	98.8	118.5	138.3	158.1	194.5						394	194.5
33	38								67.4	72.6	82.9	103.7	124.4	145.2	165.9	207.4	240.6					464	240.6
36	40									76.0	86.9	108.6	130.3	152.0	173.7	217.2	260.6	283.2				522	283.2
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	660	720		

steel failure

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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	660	720	(mm)	(kN)
8	10	11.3	13.2	15.1	17.0	18.9	19.5															104	19.5
10	12	14.1	16.5	18.9	21.2	23.6	25.9	28.3	30.6	30.9												131	30.9
12	14		19.8	22.6	25.5	28.3	31.1	33.9	36.8	39.6	45.0											159	45.0
16	18			29.0	32.7	36.3	39.9	43.6	47.2	50.8	58.1	72.6	83.7									231	83.7
20	22			30.4	34.2	38.0	41.8	45.6	49.4	53.2	60.8	76.0	91.2	106.5	121.7	130.7						344	130.7
24	28					39.5	43.5	47.4	51.4	55.3	63.2	79.0	94.8	110.6	126.4	158.1	188.3					476	188.3
27	30						48.9	53.3	57.8	62.2	71.1	88.9	106.7	124.5	142.2	177.8	213.4	240.0	244.8			551	244.8
30	35							59.3	64.2	69.1	79.0	98.8	118.5	138.3	158.1	197.6	237.1	266.7	296.4	299.2		606	299.2
33	38								67.4	72.6	82.9	103.7	124.4	145.2	165.9	207.4	248.8	280.0	311.1	342.2	370.1	714	370.1
36	40									76.0	86.9	108.6	130.3	152.0	173.7	217.2	260.6	293.2	325.8	358.3	390.9	803	435.7
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	660	720		

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	660	720	(mm)	(kN)
8	10	11.3	13.2	15.1	17.0	18.9	20.7	22.6	24.5	26.4	27.2											144	27.2
10	12	14.1	16.5	18.9	21.2	23.6	25.9	28.3	30.6	33.0	37.7	43.1										183	43.1
12	14		19.8	22.6	25.5	28.3	31.1	33.9	36.8	39.6	45.2	56.6	62.6									221	62.6
16	18			29.0	32.7	36.3	39.9	43.6	47.2	50.8	58.1	72.6	87.1	101.6	116.6							321	116.6
20	22			30.4	34.2	38.0	41.8	45.6	49.4	53.2	60.8	76.0	91.2	106.5	121.7	152.1						479	182.0
24	28					39.5	43.5	47.4	51.4	55.3	63.2	79.0	94.8	110.6	126.4	158.1	189.7					664	262.2
27	30						48.9	53.3	57.8	62.2	71.1	88.9	106.7	124.5	142.2	177.8	213.4	240.0				767	341.0
30	35							59.3	64.2	69.1	79.0	98.8	118.5	138.3	158.1	197.6	237.1	266.7	296.4			844	416.7
33	38								67.4	72.6	82.9	103.7	124.4	145.2	165.9	207.4	248.8	280.0	311.1	342.2		994	515.5
36	40									76.0	86.9	108.6	130.3	152.0	173.7	217.2	260.6	293.2	325.8	358.3	390.9	1118	606.9
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	660	720		

A4-70 Stainless Steel Studding

Stud Diameter	Hole Diameter	steel failure; 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	660	720	(mm)	(kN)
8	10	11.3	13.2	13.7																		73	13.7
10	12	14.1	16.5	18.9	21.2	21.7																92	21.7
12	14		19.8	22.6	25.5	28.3	31.1	31.6														112	31.6
16	18			29.0	32.7	36.3	39.9	43.6	47.2	50.8	58.1	58.8										162	58.8
20	22			30.4	34.2	38.0	41.8	45.6	49.4	53.2	60.8	76.0	91.2	91.7								241	91.7
24	28					39.5	43.5	47.4	51.4	55.3	63.2	79.0	94.8	110.6	126.4	132.1						334	132.1
27	30						48.9	53.3	57.8	62.2	71.1	80.2									1	181	80.2
30	35							59.3	64.2	69.1	79.0	98.1									1	199	98.1
33	38								67.4	72.6	82.9	103.7	121								1	234	121.3
36	40									76.0	86.9	108.6	130.3	143							1	263	142.8
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	660	720		

*1 = Tensile strength 500N/mm2

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	660	720	(mm)	(kN)
8	10	11.3	13.2	15.1	15.7																	83	15.7
10	12		16.5	18.9	21.2	23.6	24.8															105	24.8
12	14		19.8	22.6	25.5	28.3	31.1	33.9	36.1													128	36.1
16	18			29.0	32.7	36.3	39.9	43.6	47.2	50.8	58.1	67.2										185	67.2
20	22			30.4	34.2	38.0	41.8	45.6	49.4	53.2	60.8	76.0	91.2	104.8								276	104.8
24	28					39.5	43.5	47.4	51.4	55.3	63.2	79.0	94.8	110.6	126.4	132.1					2	334	132.1
27	30						48.9	53.3	57.8	62.2	71.1	80.2									1	181	80.2
30	35							59.3	64.2	69.1	79.0	98.1									1	199	98.1
33	38								67.4	72.6	82.9	103.7	121.3								1	234	121.3
36	40									76.0	86.9	108.6	130.3	142.8							1	263	142.8
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	660	720		

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	720	800	(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		13.2	15.1	17.0	18.9	20.7	22.6	24.5	26.4	30.2	37.7	45.2	49.2								261	49.2
16	20			19.0	21.4	23.7	26.1	28.5	30.9	33.2	38.0	47.5	57.0	66.5	76.0							368	87.4
20	25			20.4	22.9	25.5	28.0	30.6	33.1	35.7	40.8	51.0	61.2	71.4	81.6	102.0						536	136.6
25	30					29.9	32.9	35.9	38.9	41.9	47.9	59.8	71.8	83.8	95.8	119.7	149.6					657	196.5
28	35						34.6	37.7	40.8	44.0	50.3	62.8	75.4	88.0	100.5	125.7	157.1	176.0				852	267.8
32	40								46.7	50.3	57.5	71.8	86.2	100.5	114.9	143.6	179.5	201.1	229.8			974	349.7
36	44									56.6	64.6	80.8	97.0	113.1	129.3	161.6	202.0	226.2	258.5	290.9		1098	443.5
40	50										67.0	83.8	100.5	117.3	134.1	167.6	209.5	234.6	268.1	301.6	335.1	1304	546.3
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	500	560	640	720	800		

*1 = Tensile strength 500N/mm2

*2 = Tensile strength 700N/mm2

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

High bond reinforcing bars Fyk=420N/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	720	800	(mm)	(kN)
8	10	8.4	9.8	11.2	12.6	14.0	15.4	18.4														120	18.4
10	12	10.5	12.2	14.0	15.7	17.5	19.2	20.9	22.7	24.4	28.7											149	28.7
12	15		13.2	15.1	17.0	18.9	20.7	22.6	24.5	26.4	30.2	41.3										197	41.3
16	18			19.0	21.4	23.7	26.1	28.5	30.9	33.2	38.0	47.5	57.0	73.4								277	73.4
20	25			20.4	22.9	25.5	28.0	30.6	33.1	35.7	40.8	51.0	61.2	71.4	81.6	102.0						426	114.8
25	30					29.9	32.9	35.9	38.9	41.9	47.9	59.8	71.8	83.8	95.8	119.7	165.1					490	165.1
28	35						34.6	37.7	40.8	44.0	50.3	62.8	75.4	88.0	100.5	125.7	157.1	176.0				632	225.0
32	40								46.7	50.3	57.5	71.8	86.2	100.5	114.9	143.6	179.5	201.1	229.8			722	293.7
36	44									56.6	64.6	80.8	97.0	113.1	129.3	161.6	202.0	226.2	258.5	290.9		865	372.5
40	50										67.0	83.8	100.5	117.3	134.1	167.6	209.5	234.6	268.1	301.6	335.1	959	458.9
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	500	560	640	720	800		

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Characteristic and Design Load resistances based on characteristic bond strengths for hef 4d (minimum embedment) to 20d

	Non Cracked Concrete						Cracked Concrete						
	Characteris c Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Characteris c Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Nominal Embedment
Size (mm)	Tension N_{rk}	Shear V_{rk}	Tension N_{rd}	Shear V_{rd}	Tension N_{rec}	Shear V_{rec}	Tension N_{rk}	Shear V_{rk}	Tension N_{rd}	Shear V_{rd}	Tension N_{rec}	Shear V_{rec}	(mm)
8	20.36	9.00	11.31	7.20	8.08	5.14	Not Applicable		Not Applicable		Not Applicable		60
	27.14		15.08		10.77								**80**
	54.29		30.16		21.54								160
10	25.45	15.00	14.14	12.00	10.10	8.57							60
	38.17		21.21		15.15								**90**
	84.82		47.12		33.66								200
12	35.63	21.00	19.79	16.80	14.14	12.00	18.47	21.00	10.26	16.80	7.33	12.00	70
	55.98		31.10		22.22		28.00		15.56		11.11		**110**
	122.15		67.86		48.47		63.33		35.19		25.13		240
16	52.28	39.00	29.04	31.20	20.74	22.29	24.13	39.00	13.40	31.20	9.57	22.29	80
	81.68		45.38		32.41		39.20		21.78		15.56		**125**
	209.10		116.17		82.98		96.51		53.62		38.30		320
20	67.86	61.00	32.31	48.80	23.08	34.86	31.10	61.00	14.81	48.80	10.58	34.86	90
	128.18		61.04		43.60		58.96		28.08		20.06		**170**
	301.59		143.62		102.58		138.23		65.82		47.02		400
24	82.94	88.00	39.49	70.40	28.21	50.29	37.70	88.00	17.95	70.40	12.82	50.29	100
	174.17		82.94		59.24		78.37		37.32		26.66		**210**
	398.10		189.57		135.41		180.96		86.17		61.55		480
27	102.64	115.00	48.87	92.00	34.91	65.71	46.65	115.00	22.22	92.00	15.87	65.71	110
	223.93		106.63		76.17		96.29		45.85		32.75		**240**
	503.85		239.93		171.38		229.02		109.06		77.90		540
30	124.41	142.50	59.24	114.00	42.32	81.43	56.55	142.50	26.93	114.00	19.23	81.43	120
	290.28		138.23		98.74		119.00		56.67		40.48		**280**
	622.04		296.21		211.58		282.74		134.64		96.17		600
33	141.51	173.50	67.39	138.80	48.13	99.14	64.02	173.50	30.48	138.80	21.77	99.14	130
	326.57		155.51		111.08		130.63		62.20		44.43		**300**
	718.45		342.12		244.37		325.01		154.77		110.55		660
36	169.65	212.50	80.78	170.00	57.70	121.43	76.34	212.50	36.35	170.00	25.97	121.43	150
	384.53		183.11		130.79		146.12		69,6		49.70		**340**
	814.30		387.76		276.97		366.44		174.49		124.64		720

Table notes : see back page

Bond Strength Factor

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

Concrete Strength N/mm2 (MPa)	C15/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
fc =	0.98	1.00	1.02	1.04	1.06	1.08	1.09	1.10

Influence of environmental conditions in non cracked concrete

		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36
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
	Flooded	1.00	0.94	0.87	0.79	0.71	0.65	0.65	0.60	0.57	0.55
Temp II 60°C / 43°C	Dry and Wet	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
	Flooded	0.65	0.63	0.61	0.59	0.57	0.54	0.52	0.50	0.48	0.46
Temp III 72°C / 43°C	Dry and Wet	0.57	0.56	0.54	0.53	0.52	0.51	0.50	0.48	0.47	0.46
	Flooded	0.57	0.54	0.52	0.51	0.50	0.49	0.47	0.45	0.44	0.42

Influence of environmental conditions in cracked concrete

		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36
Temp I 40°C / 24°C	Dry and Wet	n/a	n/a	0.50	0.48	0.46	0.45	0.43	0.41	0.40	0.38
	Flooded	n/a	n/a	0.50	0.42	0.38	0.38	0.32	0.28	0.24	0.20
Temp II 60°C / 43°C	Dry and Wet	n/a	n/a	0.32	0.31	0.30	0.29	0.28	0.27	0.26	0.25
	Flooded	n/a	n/a	0.32	0.29	0.28	0.27	0.25	0.23	0.22	0.20
Temp III 72°C / 43°C	Dry and Wet	n/a	n/a	0.27	0.27	0.26	0.25	0.25	0.24	0.23	0.20
	Flooded	n/a	n/a	0.27	0.27	0.26	0.25	0.25	0.24	0.23	0.22

Table notes: see back page

SAXON PAINTS.

Characteristic and Design Load resistances for REBAR based on characteristic bond strengths for hef 4d (min embedment) to 20d

	Non Cracked Concrete						Cracked Concrete						
	Characteris c Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Characteris c Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Nominal Embedment
Rebar Ø	Tension N_{rk}	Shear V_{rk}	Tension N_{rd}	Shear V_{rd}	Tension N_{rec}	Shear V_{rec}	Tension N_{rk}	Shear V_{rk}	Tension N_{rd}	Shear V_{rd}	Tension N_{rec}	Shear V_{rec}	(mm)
8	15.08	13.95	8.38	9.30	5.98	6.64	Not Applicable		Not Applicable		Not Applicable		60
	20.11		11.17		7.98								**80**
	40.21		22.34		15.96								160
10	18.85	21.45	10.47	14.30	7.48	10.21							60
	28.27		15.71		11.22								**90**
	62.83		34.91		24.93								200
12	23.75	31.05	13.19	20.70	9.42	14.79	13.19	31.05	7.33	20.70	5.24	14.79	70
	37.32		20.73		14.81		20.73		11.52		8.23		**110**
	81.43		45.24		32.31		45.24		25.13		17.95		240
14	30.78	42.45	17.10	28.30	12.21	20.21	16.71	42.45	9.29	28.10	6.63	20.07	80
	44.25		24.58		17.56		22.56		12.54		8.96		**115**
	107.73		59.85		42.75		58.50		32.50		23.21		280
16	34.18	55.50	18.99	37.00	13.56	26.43	18.10	55.50	10.05	37.00	7.18	26.43	80
	53.41		29.67		21.19		25.10		13.94		9.96		**125**
	136.72		75.96		54.25		72.38		40.21		28.72		320
18	37.32	69.66	20.73	46.44	14.81	33.17	19.23	69.66	10.68	46.44	7.63	33.17	80
	69.98		38.88		27.77		31.50		17.50		12.50		**150**
	167.95		93.31		66.65		86.52		48.07		34.33		360
20	45.24	86.55	21.54	57.70	15.39	41.21	22.62	86.55	10.77	57.70	7.69	41.21	90
	85.45		40.69		29.07		37.60		17.90		12.79		**170**
	201.06		95.74		68.39		100.53		47.87		34.19		400
22	55.29	104.01	26.33	69.34	18.81	49.53	25.92	104.00	12.34	69.34	8.82	49.53	100
	105.06		50.03		35.73		45.18		21.51		15.37		**190**
	243.29		115.85		82.75		114.04		54.30		38.79		440
25	62.83	135.00	29.92	90.00	21.37	64.29	27.49	135.00	13.09	90.00	9.35	64.29	100
	131.95		62.83		44.88		56.73		27.02		19.30		**210**
	314.16		149.60		106.86		137.45		65.45		46.75		500
28	73.89	168.75	35.19	112.50	25.13	80.36	34.48	168.75	16.42	112.50	11.73	80.36	112
	184.73		87.96		62.83		77.60		36.95		26.39		**280**
	369.45		175.93		125.66		172.41		82.10		58.64		560
32	96.51	220.95	45.96	147.30	32.83	105.21	45.04	220.95	21.45	147.30	15.32	105.21	128
	241.27		114.89		82.07		98.92		47.10		33.65		**320**
	482.55		229.79		164.13		225.19		107.23		76.60		640

Bond Strength Factors - REBAR Influence of concrete strength on combined pull out and concrete cone resistance

Concrete Strength N/mm2 (MPa)	C15/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
fc =	0.98	1.00	1.02	1.04	1.06	1.08	1.09	1.10
Concrete Strength N/mm2 (MPa)	C55/67	C60/75	C70/85	C80/96	C90/105	-	-	-
fc =	1.10	1.12	1.13	1.14	1.15	-	-	-

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
	Flooded	1.00	0.94	0.90	0.87	0.85	0.82	0.80	0.76	0.71	0.65	0.63
Temp II 60°C / 43°C	Dry and Wet	0.67	0.65	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60	0.59
	Flooded	0.65	0.64	0.61	0.60	0.59	0.59	0.58	0.57	0.56	0.55	0.47
Temp III 72°C / 43°C	Dry and Wet	0.60	0.58	0.57	0.57	0.56	0.56	0.56	0.55	0.55	0.54	0.53
	Flooded	0.58	0.56	0.53	0.52	0.50	0.47	0.47	0.46	0.45	0.43	0.41

Influence of environmental conditions in 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	n/a	n/a	0.55	0.51	0.47	0.45	0.44	0.43	0.43	0.42	0.41
	Flooded	n/a	n/a	0.55	0.48	0.42	0.41	0.40	0.39	0.38	0.36	0.35
Temp II 60°C / 43°C	Dry and Wet	n/a	n/a	0.30	0.29	0.28	0.27	0.26	0.25	0.24	0.23	0.23
	Flooded	n/a	n/a	0.30	0.28	0.27	0.26	0.25	0.24	0.23	0.22	0.22
Temp I 72°C / 43°C	Dry and Wet	n/a	n/a	0.30	0.28	0.26	0.25	0.25	0.24	0.24	0.23	0.22

	Flooded	n/a	n/a	0.30	0.28	0.26	0.25	0.24	0.24	0.23	0.23	0.22

Table notes : see back page

Material Properties for grades of other threaded rod and rebar

	Stud Grade 8.8		**Stud Grade 10.9**		**Stud Grade A4-70**		**Stud Grade A4-80**	
Stud Diameter (mm)	$N_{rk,s}$ (kN)	$N_{rd,s}$ (kN)	$N_{rk,s}$ (kN)	$N_{rd,s}$ (kN)	$N_{rk,s}$ (kN)	$N_{rd,s}$ (kN)	$N_{rk,s}$ (kN)	$N_{rd,s}$ (kN)
M8	29.2	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	67.4	44.9	87.7	62.6	59.0	31.6	67.4	36.0
M16	125.6	83.7	163.0	116.4	109.9	58.8	125.7	67.2
M20	196.1	130.7	255.0	182.1	171.5	91.7	196.0	104.8
M24	282.5	188.3	367.0	262.1	247.1	132.1	293.0	132.1
M27	367.0	244.7	477.4	341.0	229.4	80.2	229.4	80.2
M30	448.8	299.2	583.0	416.4	280.6	98.1	280.6	98.1
M33	555.2	370.1	721.8	515.5	347.0	121.3	347.0	121.3
M36	653.6	435.7	849.7	606.9	408.4	142.8	408.4	142.8

	Stud Grade 8.8		**Stud Grade 10.9**		**Stud Grade A4-70**		**Stud Grade A4-80**	
Stud Diameter (mm)	$V_{rk,s}$ (kN)	$V_{rd,s}$ (kN)	$V_{rk,s}$ (kN)	$V_{rd,s}$ (kN)	$V_{rk,s}$ (kN)	$V_{rd,s}$ (kN)	$V_{rk,s}$ (kN)	$V_{rd,s}$ (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
M27	183.5	146.8	238.7	191.0	114.7	48.4	114.7	48.4
M30	224.4	179.5	291.5	215.9	140.3	89.9	140.3	89.9
M33	277.6	222.1	360.9	288.7	173.5	111.2	173.5	111.2
M36	326.8	261.4	424.8	283.2	204.2	130.9	204.2	130.9

Effect of Anchor Spacing – Tension Effect of Edge Distance - Tension

	Rebar BSt 500 to DIN 488		Rebar BSt 500 to DIN 488	
Rebar Diameter (mm)	$N_{rk,s}$	$N_{rd,s}$	$V_{rk,s}$	$V_{rd,s}$
	(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
14	84.4	67.0	42.5	28.3
16	111.0	79.3	55.5	37.0
18	139.5	100.0	70.0	46.7
20	173.0	123.6	86.5	57.7
22	208.3	149.3	104.5	69.7
25	270.0	192.9	135.0	90.0
28	339.0	242.1	169.0	112.7
32	442	315.7	221	147.3
36	563.2	443.5	281.6	187.7
40	693.8	546.3	346.9	231.3

Table notes :
see back page

Anchor Spacing	Stud / Rebar Diameter										
(mm)	8	10	12	16	20	24	27	30	33	36	40
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	0.63				
150	0.96	0.86	0.80	0.73	0.68	0.65	0.64	0.63			
160	1.00	0.88	0.82	0.74	0.70	0.66	0.65	0.63	0.63	0.63	0.63
175		0.92	0.85	0.76	0.71	0.67	0.66	0.64	0.63	0.63	0.63
200		1.00	0.90	0.80	0.74	0.69	0.69	0.66	0.65	0.65	0.65
225			0.95	0.84	0.77	0.72	0.71	0.68	0.67	0.67	0.66
240			1.00	0.86	0.79	0.73	0.72	0.69	0.68	0.68	0.67
250				0.87	0.80	0.74	0.73	0.70	0.69	0.68	0.68
275				0.91	0.83	0.76	0.75	0.72	0.71	0.70	0.69
280				0.92	0.84	0.77	0.76	0.73	0.71	0.70	0.69
300				0.95	0.86	0.79	0.78	0.74	0.73	0.72	0.71
320				1.00	0.88	0.81	0.80	0.76	0.74	0.73	0.72
350					0.92	0.83	0.82	0.78	0.77	0.75	0.73
400					1.00	0.88	0.87	0.82	0.80	0.78	0.76
440						0.92	0.91	0.85	0.83	0.81	0.79
480						1.00	0.94	0.88	0.86	0.84	0.81
540							1.00	0.93	0.91	0.88	0.84
600								1.00	0.96	0.92	0.88
660									1.00	0.96	0.91
720										1.00	0.95
800											1.00

Edge Distance	Stud / Rebar Diameter										
(mm)	8	10	12	16	20	24	27	30	33	36	40
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							
40	0.25										
90		0.91	0.80	0.67							
50	0.44	0.30									
100		1.00	0.86	0.71	0.63						
60	0.63	0.48	0.30								
110			0.92	0.76	0.66						
70	0.81	0.65	0.44								
120			1.00	0.80	0.70	0.64					
80	1.00	0.83	0.58	0.40							
140				0.89	0.77	0.67	0.63	0.63			
90		1.00	0.72	0.53							
160				1.00	0.84	0.72	0.70	0.65	0.63	0.67	
100			0.86	0.67	0.35						
180					0.91	0.78	0.75	0.70	0.66	0.71	0.68
110			1.00	0.80	0.44						
200					1.00	0.84	0.81	0.76	0.71	0.74	0.71
125				1.00	0.58	0.35					
220						0.89	0.86	0.81	0.75	0.78	0.75
140					0.72	0.46	0.35	0.30			
240						1.00	0.92	0.86	0.80	0.82	0.78
160					0.91	0.62	0.51	0.35	0.32	0.33	
270							1.00	0.94	0.87	0.87	0.83
180					1.00	0.77	0.63	0.46	0.37	0.43	
300								1.00	0.94	0.93	0.88
200						0.92	0.75	0.57	0.46	0.50	0.32
330									1.00	0.98	0.93
220						1.00	0.88	0.68	0.56	0.56	0.53
360										1.00	0.98
240							1.00	0.78	0.65	0.63	0.59
400											1.00
280								1.00	0.84	0.77	0.72
310									1.00	0.90	0.82
330										1.00	0.89
400											1.00

Effect of Edge Distance - Shear

Minimum Curing Time

Concrete Temperature	Gel - Working Time	Minimum curing me in dry concrete	Minimum curing me in wet concrete
5°C	120 min	24 h	x2
15°C	60 min	18 h	x2
25°C	20 min	7 h	x2
35°C	12 min	5 h	x2
45°C	6 min	4 h	x2

- 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 +60°C	+43°C	+60°C
Range III	-40°C to +72°C	+43°C	+72°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 me.**

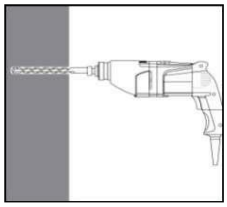
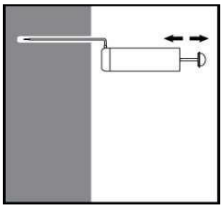
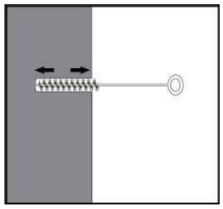
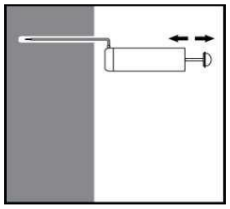
Long term temperatures will include constant or near constant temperatures, such as those experienced in cold stores or next to heating installations.

Physical Properties

	N/mm2 (MPa)	Test Method
Compressive Strength	95	EN ISO 604 / ASTM 695
Flexural Strength	52.79	EN ISO 178 / ASTM 790

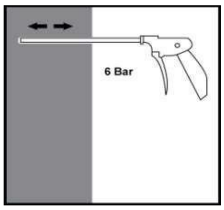
Flexural Modulus	4331	EN ISO 178 / ASTM 790
Tensile Strength	26.94	EN ISO 527 / ASTM 638
E Modulus	7267	EN ISO 527 / ASTM 638
VOC Content	A+ Rating	-

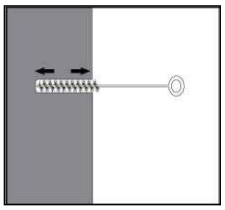
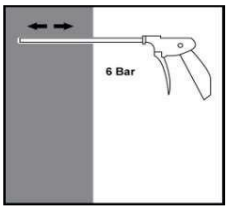
Installation parameters: drilling hole cleaning and installation

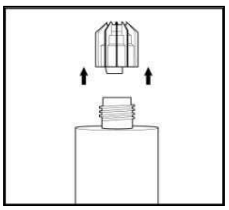
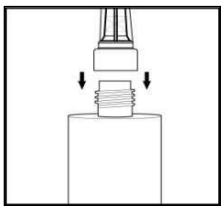
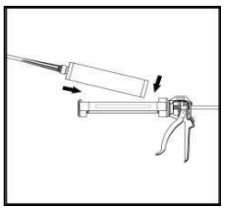
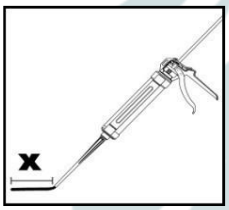
Drill hole in the substrate to the required embedment depth using the appropriately sized carbide drill bit. Bore hole cleaning Just before setting an anchor, the bore hole must be free of dust and debris. The manual pump shall be used for blowing out bore holes up to diameters do ≤ 24mm and embedment 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

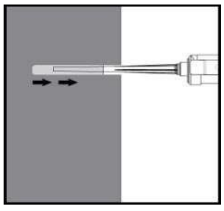
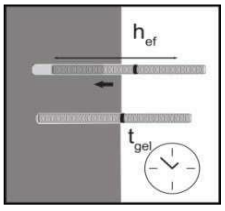


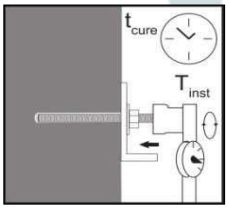



Blow 2 times from the back of the hole (if needed with a nozzle extension) over the whole length with oil-free compressed air (min. 6 bar at 6 m³/h). Brush 2 times with the specified brush size by inserting the steel brush to the back of the hole (if needed with an extension) in a twisting motion and 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. The applied torque shall not exceed the values Tmax given.

Chemical Resistance Chart

Chemical	Chemicals Tested	Resistant	Not Resistant
Alkaline	Concrete Drilling Mud (10%) pH=12.6	+	
	Concrete Drilling Mud (10%) pH=13.2	+	
	Concrete Potash solution (10%) pH=14.0	+	
Acids	Acetic Acid (10%)[1]		--
	Nitric Acid (10%)[1]		--
	Hydrochloric Acid (10%) 3 Month		--
	Sulfuric Acid (10%)		--
Solvents	Benzyl Alcohol		--
	Ethanol		--
	Ethyl acetate		--
	Methyl ethyl ketone (MEK)		--
	Triclorethylene		--
	Xylene (mixture)	+	
Chemicals used on	Concrete plasticizer	+	
job sites	Diesel oil	+	
	Oil	+	
	Petrol	+	
	Oil for form work (forming oil)	+	

Environmental	Salt Water	+
Chemicals	de-mineralized water	+
	salt spraying test	+
	SO_2	+
	Environment / Weather	+

1 - concrete was disolved by acid

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 or concrete cone failure

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 (25 Mpa)

5.8 grade stud

Temperature range I maximum long term / short term temperature +24/40°C

PAGE 3 to 6 :

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 (700MPa)

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

PAGE 7 and 9 :

Characteristic and Design Load resistances based on characteristic bond strengths for hef 4d (minimum embedment) to 20d

All data is based on correct installation - see instructions

No influence of edge and spacing or concrete cone failure

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)

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

PAGE 8 & 10 :

Bond Strength Factors

Select concrete strength and environmental condition and apply to bond strength table on page 4

PAGE 11 :

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

Safety factor is 1.56 for stainless steel, up to M24, M30 and M36 is 2.0

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

Par al Safety Factors :

1.8 for 8mm-16mm rebar and studs

2.1 for 16mm and above rebar and studs

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