CHEMIRES EPOXY CHEMICAL ANCHOR

CHEMIRES Epoxy Chemical Anchor is a two component chemical anchoring injection system. A formulation derived from epoxy acrylate resin with high bond strength, developed principally to anchor threaded rods into concrete

- ✓ **Easy application**
- ✓ **Excellent adhesion**
- ✓ **For medium to high loads**
- ✓ **Simple extrusion and injection**
- ✓ **Can be applied horizontally or vertically**
- ✓ **No styrene**
- ✓ **Quick-drying**
- ✓ **Can be used in poorly ventilated areas**
- ✓ **Good durability formulation and resistance to chemicals**

APPLICATIONS

It can be used in concrete, stone, tiles and hollow concrete blocks in a wide range of applications: fixing doors, balconies, blinds, awnings, antennas, signs, industrial machinery.

It is also suitable for structural applications, with reinforcement bars in new construction or restoration works, and anchoring anchors for prefabricated concrete elements.

INDICATIONS

Before injecting, check the expiration date of the product, the resistance of the support and the temperature of use. Application and adjustment of the product are only possible before it sets.

This product should be stored between +5˚C and +25˚C.

Avoid direct sunlight.

The Shelf life of the product is 18 months from the manufacture date.

SAP	ml		EAN
CH080004	400	12	5608907394953
CH080006	300	15	5608907505168

TECHNICAL DATA

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	17.79		9.88		7.06						60	10	9	10
	19.00	9.00	12.70	7.20	9.07	5.14	80	160	80	40	80			
	19.00		12.70		9.07						160			
10	20.81		11.56		8.26						60	12	12	20
	30.20	15.00	20.10	12.00	14.36	8.57	100	200	90	50	90			
	30.20		20.10		14.36						200			
12	27.45		15.25		10.89						70	14	14	40
	43.13	21.00	23.96	16.80	17.11	12.00	120	240	110	60	110			
	43.80		29.20		20.86						240			
16	39.97		22.21		15.86						80	18	18	80
	62.46	39.00	34.70	31.20	24.78	22.29	160	320	125	80	125			
	81.60		54.40		38.86						320			
20	50.89		28.27		20.20						90	24	22	120
	96.13	61.00	53.41	48.80	38.15	34.86	200	400	180	100	170			
	127.40		84.90		60.64						400			
24	58.28		32.38		23.13						100	28	26	160
	122.39	88.00	68.00	70.40	48.57	50.29	240	480	220	120	210			
	183.60		122.40		87.43						480			
30	71.82		39.90		28.50						120	35	32	200
	167.57	142.50	93.10	114.00	66.50	81.43	280	560	280	150	280			
	292.00		194.50		138.93						600			

= Steel Failure ***Partial safety factor = 1.5***

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	9.9	11.5	12.7																		77	12.7
10	12	11.6	13.5	15.4	17.3	19.3	20.1															104	20.1
12	14		15.3	17.4	19.6	21.8	24.0	26.2	28.3	29.2												134	29.2
16	18			22.2	25.0	27.8	30.5	33.3	36.1	38.9	44.4	54.4										196	54.4
20	24			25.1	28.3	31.4	34.6	37.7	40.8	44.0	50.3	62.8	75.4	84.9								270	84.9
24	28					32.4	35.6	38.8	42.1	45.3	51.8	64.7	77.6	90.6	103.5	122.4						378	122.4
27	32						36.4	39.7	43.0	46.3	52.9	66.2	79.4	92.6	105.9	132.3	158.8	159.1				481	159.1
30	35							39.9	43.3	46.6	53.2	66.5	79.9	93.2	106.5	133.1	159.7	179.7	194.5			584	194.5
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	660	720		

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	9.9	11.5	13.2	14.8	16.5	18.1	19.5														118	19.5
10	12	11.6	13.5	15.4	17.3	19.3	21.2	23.1	25.0	27.0	30.9											161	30.9
12	14		15.3	17.4	19.6	21.8	24.0	26.2	28.3	30.5	34.9	43.6	45.0									206	45.0
16	18			22.2	25.0	27.8	30.5	33.3	36.1	38.9	44.4	55.5	66.6	77.7	83.7							302	83.7
20	24			25.1	28.3	31.4	34.6	37.7	40.8	44.0	50.3	62.8	75.4	88.0	100.5	125.7						416	130.7
24	28					32.4	35.6	38.8	42.1	45.3	51.8	64.7	77.6	90.6	103.5	129.4	155.3					582	188.3
27	32						36.4	39.7	43.0	46.3	52.9	66.2	79.4	92.6	105.9	132.3	158.8	178.7				740	244.8
30	35							39.9	43.3	46.6	53.2	66.5	79.9	93.2	106.5	133.1	159.7	179.7	199.6			899	299.2
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	660	720		

= *Steel Failure*

10.9 Grade Steel Studding

Stud Diameter	Hole Diameter	Embedment Depth hef																				hef 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	9.9	11.5	13.2	14.8	16.5	18.1	19.8	21.4	23.1	26.4											165	27.2
10	12	11.6	13.5	15.4	17.3	19.3	21.2	23.1	25.0	27.0	30.8	38.5										224	43.1
12	14		15.3	17.4	19.6	21.8	24.0	26.2	28.3	30.5	34.9	43.6	52.3									287	62.6
16	18			22.2	25.0	27.8	30.5	33.3	36.1	38.9	44.4	55.5	66.6	77.7	88.8							420	116.6
20	24			25.1	28.3	31.4	34.6	37.7	40.8	44.0	50.3	62.8	75.4	88.0	100.5	125.7						579	182.0
24	28					32.4	35.6	38.8	42.1	45.3	51.8	64.7	77.6	90.6	103.5	129.4	155.3					811	262.2
27	32						36.4	39.7	43.0	46.3	52.9	66.2	79.4	92.6	105.9	132.3	158.8	178.7				1031	341.0
30	35							39.9	43.3	46.6	53.2	66.5	79.9	93.2	106.5	133.1	159.7	179.7	199.6			1252	416.7
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	Embedment Depth hef																				hef 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	9.9	11.5	13.2	13.7																	83	13.7
10	12	11.6	13.5	15.4	17.3	19.3	21.2	21.7														113	21.7
12	14		15.3	17.4	19.6	21.8	24.0	26.2	28.3	30.5	31.6											145	31.6
16	18			22.2	25.0	27.8	30.5	33.3	36.1	38.9	44.4	55.5	58.8									212	58.8
20	24			25.1	28.3	31.4	34.6	37.7	40.8	44.0	50.3	62.8	75.4	88.0	91.7							292	91.7
24	28					32.4	35.6	38.8	42.1	45.3	51.8	64.7	77.6	90.6	103.5	129.4	132.1					408	132.1
27	32						36.4	39.7	43.0	46.3	52.9	66.2	79.4	80.2							1	243	80.2
30	35							39.9	43.3	46.6	53.2	66.5	79.9	93.2	98.1						1	295	98.1
Depth (mm)		60	70	80	90	100	110	120	130	140	160	200	240	280	320	400	480	540	600	660	720		

steel failure

A4-80 Stainless Steel Studding

Stud Diameter	Hole Diameter	Embedment Depth hef																				hef 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	9.9	11.5	13.2	14.8	15.7																95	15.7
10	12		13.5	15.4	17.3	19.3	21.2	23.1	24.8													129	24.8
12	14		15.3	17.4	19.6	21.8	24.0	26.2	28.3	30.5	34.9	36.1										165	36.1
16	18			22.2	25.0	27.8	30.5	33.3	36.1	38.9	44.4	55.5	66.6	67.2								242	67.2
20	24			25.1	28.3	31.4	34.6	37.7	40.8	44.0	50.3	62.8	75.4	88.0	100.5	104.8						334	104.8
24	28					32.4	35.6	38.8	42.1	45.3	51.8	64.7	77.6	90.6	103.5	129.4	132.1					408	132.1
27	32						36.4	39.7	43.0	46.3	52.9	66.2	79.4	80.2							2	243	80.2
30	35							39.9	43.3	46.6	53.2	66.5	79.9	93.2	98.1						2	295	98.1
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																				hef 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	12	8.6	10.0	11.5	12.9	14.3	15.8	17.2	18.6	20.1	21.9											153	21.9
10	14	10.4	12.1	13.8	15.6	17.3	19.0	20.7	22.5	24.2	27.6	34.1										198	34.1
12	16		12.9	14.8	16.6	18.5	20.3	22.2	24.0	25.9	29.6	36.9	44.3									266	49.2
16	20			18.0	20.3	22.5	24.8	27.0	29.3	31.5	36.0	45.0	54.1	63.1	72.1							388	87.4
20	25			19.1	21.5	23.9	26.3	28.7	31.0	33.4	38.2	47.8	57.3	66.9	76.4	95.5						572	136.6
25	30					25.0	27.5	30.0	32.5	35.0	40.0	50.0	60.0	70.1	80.1	100.1	125.1					786	196.5
28	35						29.0	31.7	34.3	36.9	42.2	52.8	63.3	73.9	84.5	105.6	132.0	147.8				1015	267.8
32	40								35.3	38.0	43.4	54.3	65.2	76.0	86.9	108.6	135.7	152.0	173.7			1288	349.7
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

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

	Non Cracked Concrete						Cracked Concrete						
	Characteristic Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Characteristic Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Nominal Embed-ment
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	17.79	9.00	9.89	7.20	7.06	5.14	Not Applicable		Not Applicable		Not Applicable		60
	23.73		13.18		9.41								**80**
	47.45		26.36		18.83								160
10	20.81	15.00	11.56	12.00	8.26	8.57	Not Applicable		Not Applicable		Not Applicable		60
	31.21		17.34		12.39								**90**
	69.37		38.54		27.53								200
12	27.45	21.00	15.25	16.80	10.89	12.00	Not Applicable		Not Applicable		Not Applicable		70
	43.13		23.96		17.11								**110**
	94.10		52.28		37.34								240
16	39.97	39.00	22.21	31.20	15.86	22.29	Not Applicable		Not Applicable		Not Applicable		80
	62.46		34.70		24.78								**125**
	159.88		88.82		63.45								320
20	50.89	61.00	28.27	48.80	20.20	34.86	Not Applicable		Not Applicable		Not Applicable		90
	96.13		53.41		38.15								**170**
	226.20		125.66		89.76								400
24	58.28	88.00	32.38	70.40	23.13	50.29	Not Applicable		Not Applicable		Not Applicable		100
	122.39		68.00		48.57								**210**
	279.76		155.42		111.02								480
30	71.82	207.00	39.90	165.60	28.50	118.29	Not Applicable		Not Applicable		Not Applicable		120
	167.57		93.10		66.50								**280**
	359.08		199.49		142.49								600

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 =	0.98	1.00	1.03	1.06	1.09	1.13	1.16	1.20

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	0.90	0.88	0.87	0.86	0.85	0.84	0.82

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

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

	Non Cracked Concrete						Cracked Concrete						
	Characteristic Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Characteristic Resistance (kN)		Design Resistance (kN)		Recommended Load (kN)		Nominal Embed-ment
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	15.47	13.95	8.60	9.30	6.14	6.64	Not Applicable		Not Applicable		Not Applicable		60
	20.63		11.46		8.19								**80**
	41.26		22.92		16.37								160
10	18.66	21.45	10.37	14.30	7.41	10.21	Not Applicable		Not Applicable		Not Applicable		60
	27.99		15.55		11.11								**90**
	62.20		34.56		24.68								200
12	23.28	31.05	12.93	20.70	9.24	14.79	Not Applicable		Not Applicable		Not Applicable		70
	36.58		20.32		14.51								**110**
	79.80		44.33		31.67								240
14	29.45	42.45	16.36	28.30	11.69	20.21	Not Applicable		Not Applicable		Not Applicable		80
	42.34		23.52		16.80								115
	103.08		57.27		40.90								280
16	32.41	55.50	18.01	37.00	12.86	26.43	Not Applicable		Not Applicable		Not Applicable		80
	50.64		28.13		20.10								**125**
	129.65		72.03		51.45								320
18	33.93	69.66	18.85	46.44	13.46	33.17	Not Applicable		Not Applicable		Not Applicable		80
	63.62		35.34		25.25								150
	152.68		84.82		60.59								360
20	36.64	86.55	20.36	57.70	14.54	41.21	Not Applicable		Not Applicable		Not Applicable		90
	69.22		38.45		27.47								**170**
	162.86		90.48		64.63								400
22	42.16	104.01	23.42	69.34	16.73	49.53	Not Applicable		Not Applicable		Not Applicable		100
	80.10		44.50		31.79								190
	185.51		103.06		73.61								440
25	45.03	135.00	25.01	90.00	17.87	64.29	Not Applicable		Not Applicable		Not Applicable		100
	94.56		52.53		37.52								**210**
	225.13		125.07		89.34								500
28	62.07	168.75	29.56	112.50	21.11	80.36	Not Applicable		Not Applicable		Not Applicable		112
	155.17		73.89		52.78								**280**
	310.34		147.78		105.56								560
32	72.96	220.95	34.74	147.30	24.82	105.21	Not Applicable		Not Applicable		Not Applicable		128
	182.40		86.86		62.04								**320**
	364.81		173.72		124.08								640

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	29.2	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
M30	448.8	299.2	583.0	416.4	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
14	85.0	60.7	42.5	28.3
16	111.0	79.3	55.5	37.0
18	140.0	100.0	70.0	46.7
20	173.0	123.6	86.5	57.7
22	209.0	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

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	0.90	0.90	0.88	0.88	0.88	0.86	0.86	0.84	0.84	0.84	0.84

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	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

MINIMUM CURING TIME

Concrete temperature (°C)	-10°C	-5°C	5°C	15°C	25°C	35°C
Gel - Working time (min)	50	40	20	9	5	3
Min. Curing time in dry concrete	240	180	90	60	30	20
Min. Curing time in wet concrete	x2	x2	x2	x2	x2	x2

* Resin temperature must be at least 20°C

- Full cure 24 hours

- 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
Compressive Strength	40,7	EN ISO 604 / ASTM 695
Flexural Strength	16,6	EN ISO 178 / ASTM 790
Flexural Modulus	3111.7	EN ISO 178 / ASTM 790
Tensile Strength	7	EN ISO 527 / ASTM 638
E Modulus	5488.5	EN ISO 527 / ASTM 638
VOC Content	A+ Rating	-

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

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

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

5.8 grade stud

Temperature range i maximum long term / short term temperature +24/40ºC

PAGE 3 and 4:

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.

PAGE 5 and 6:

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

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 (25MPa)

Temperature range i maximum long term / short term temperature +24/40ºC

PAGE 6:

Bond Strength Factors

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

PAGE 8:

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

Partial Safety Factors for pages 2,3,4,5,6,7,8,9, 10:

1.8 for all sizes studs

1.8 for all sizes rebar