



### Product Information

The Vinylester 2 Part Injection Resin is suitable for use in solid concrete, solid brickwork and natural stone as well as hollow base material using suitable sleeves. It can be used for installing studs, rebar and Internal Threaded Sockets in both wet and dry conditions. It is also approved for use in contact with potable (drinking) water.

### Features

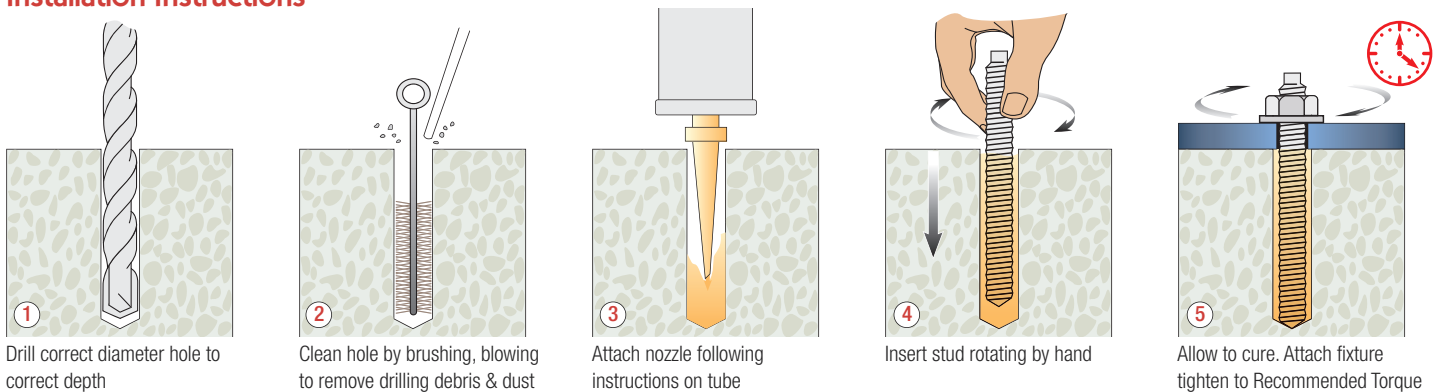
- 1 Expansion free
- 2 High Loads
- 3 Close Spacing and Edge Distance
- 4 Suitable for use with potable (drinking) water



Stud Data						
Thread Diameter	Drill Hole Diameter	Hole Depth	Maximum Fixture Thickness	Fixture Clearance Hole	Minimum Structure Thickness	Tightening Torque
mm	mm	mm	mm	mm	mm	mm
8	10	80	18	10	110	10
10	12	90	25	12	120	20
12	14	110	34	14	140	40
16	18	125	45	18	160	80
20	25	170	55	22	220	120
24	28	210	55	26	260	150

Setting Times		
Base Material Temp °C	Gel Time Mins	Load Time Mins
0	45	180
5	25	120
10	15	90
15	10	60
20	8	45
25	5	30

### Installation Instructions



Performance Data for Rebar into Concrete (According to Eurocode 2)								
Bar Diameter $d_s$ mm	Hole Diameter $d_0$ mm	Permissible Load $F_s$ in C20/25 Concrete • High Adherence 500N/mm <sup>2</sup> steel rebar						
		Embedment Depth	Tension Loads	10ds (mm) (kN)	20ds (mm) (kN)	30ds (mm) (kN)	40ds (mm) (kN)	Maximum (mm) (kN)
8	10	$l_v$		80	160	240	320	329
		$F_s$ (20/25)		5.3	10.6	15.9	21.2	21.8
10	12	$l_v$		100	200	300	400	429
		$F_s$ (20/25)		7.9	15.9	32.8	31.7	34.1
12	14	$l_v$		120	240	360	Not allowed	463
		$F_s$ (20/25)		12.7	25.5	38.2	Not allowed	49.1
14	18	$l_v$		140	280	420	560	560
		$F_s$ (20/25)		16.7	33.4	50.1	66.9	66.9
16	20	$l_v$		160	320	480	640	659
		$F_s$ (20/25)		21.2	42.4	63.7	84.9	87.4
20	25	$l_v$		200	400	600	800	823
		$F_s$ (20/25)		33.1	66.3	99.5	132.7	136.5

Method of calculation:  $F_s$  (kN) =  $d_0 \times l_v \times c / 100$  •  $d_0$  and  $l_v$  in mm, Spacing min  $10d_s$ , Edge Distance min  $5d_s$

Concrete strength class	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Characteristic bond resistance for good bond conditions (EC2) $f_c$ (N/mm <sup>2</sup> )	1.8	2.1	2.4	2.7	3.0	3.3	3.6
Factor for concrete strength class c $c = 0.06 \times \pi \times ft \times s^2/s$ $s = 1.15$ safety coefficient $s = 1.5$ high adherence bar coefficient*	0.664	0.774	0.885	0.996	1.106	1.217	1.328

\*For smooth bar use  $s = 1.0$

Performance Data (20/25 Concrete)									
Thread Diameter mm	Characteristic Resistance kN		Design Resistance kN		Approved Load kN		Spacing mm	Edge Distance mm	
	Tensile	Shear	Tensile	Shear	Tensile	Shear		Tensile & Shear	Tensile
8	19.2	9.0	12.8	7.2	9.1	5.1	160	80	90
10	30.0	14.0	20.0	11.2	14.3	8.0	180	90	125
12	40.0	21.0	26.7	16.8	19.0	12.0	220	110	160
16	60.0	39.0	40.0	31.2	28.6	22.3	250	125	270
20	102.2	61.0	56.8	48.8	40.6	34.9	340	170	300
24	151.5	88.0	84.2	70.4	60.1	50.3	420	210	360

Shear Loads towards a free edge are for single anchors where Spacing  $\geq 3 \times$  Edge Distance

Loads are for JCP Grade 5.8 Studs and Grade 70 Stainless Steel Studs \*M8, M20 & M24 Studs are not part of ETA

**Reduced Design Resistance (kN) • Divide Loads by 1.4 for Approved Loads**

Edge mm	Edge Distance (C20/25 Concrete) for single anchors												Spacing (C20/25 Concrete)						
	Tensile Resistance						Shear Resistance						Spacing mm	Tensile Resistance per Pair of Anchors					
	M8	M10	M12	M16	M20	M24	M8	M10	M12	M16	M20	M24		M8	M10	M12	M16	M20	M24
40	8.3												40	16.0					
45	8.9	13.0											45	16.4	25.0				
50	9.4	13.8					4.0						50	16.8	25.6				
55	10.0	14.6	17.4				4.4						55	17.2	26.1	33.4			
60	10.6	15.3	18.2				4.8						60	17.6	26.7	34.0			
65	11.1	16.1	19.1	27.1			5.2	5.8					65	18.0	27.2	34.6	50.4		
70	11.7	16.9	19.9	29.2			5.6	6.3					70	18.4	27.8	35.2	51.2		
80	12.8	18.4	21.6	31.4			6.4	7.2	8.4				80	19.2	28.9	36.4	52.8		
90		20.0	23.3	33.5	38.1		7.2	8.1	9.5				90	20.0	30.0	37.6	54.4	71.8	
100			25.0	35.7	40.4			9.0	10.5				100	20.8	31.1	38.8	56.0	73.5	
110			26.7	38.9	42.8	56.1		9.9	11.6				110	21.6	32.2	40.1	57.6	75.2	
125				40.0	46.3	60.3		11.2	13.1	14.4			120	22.4	33.3	41.3	59.2	76.8	108.3
130					47.4	61.7			13.7	15.0			140	24.0	35.6	43.7	62.4	80.2	112.3
150					52.1	67.4			15.8	17.3	24.4		160	25.6	37.8	46.1	65.6	83.5	116.3
160					54.5	70.2			16.8	18.5	26.0		180		40.0	48.5	68.8	86.9	120.3
170					56.8	73.0				19.6	27.7		200			51.0	72.0	90.2	124.3
190						78.6				22.0	30.9	37.2	220			53.4	75.2	93.6	128.3
210						84.2				24.3	34.2	41.1	235				77.6	96.1	131.3
230										26.6	37.4	45.0	250				80.0	98.6	134.3
270										31.2	43.9	52.8	300					106.9	144.3
300											48.8	58.7	340					113.6	152.4
330												64.5	380						160.4
360												70.4	420						168.4

**Influence of Concrete Strength**

Concrete Strength		C20/25	C25/30	C30/37	C40/50	C45/55	C50/60
Cylinder	N/mm <sup>2</sup>	20	25	30	40	45	50
Cube	N/mm <sup>2</sup>	25	30	37	50	55	60
Factor		1.00	1.10	1.22	1.41	1.48	1.55

When using concrete factors check all other information to ensure Steel Strength and Pull out Resistance is not exceeded

**Steel Design Resistance for single anchor**

		M8	M10	M12	M16	M20	M24	
Tension	kN	12.0	19.3	28.0	52.0	82.0	118.0	Grade 5.8
	kN	13.9	21.4	31.5	58.8	92.0	132.0	Stainless Steel Grade 70
Shear	kN	7.2	11.2	16.8	31.2	48.8	70.4	Grade 5.8
	kN	8.3	12.8	18.5	35.2	55.1	79.4	Stainless Steel Grade 70

**Anchor Mechanical Properties**

		M8	M10	M12	M16	M20	M24	
Nominal Tensile Strength	N/mm <sup>2</sup>	500	500	500	500	500	500	Zinc plated & H.D.G
		700	700	700	700	700	700	Stainless Steel Grade 70
Yield Strength	N/mm <sup>2</sup>	400	400	400	400	400	400	Zinc plated & H.D.G
		450	450	450	450	450	450	Stainless Steel Grade 70
Nut A/F	mm	13	17	19	24	30	36	
Washer Diameter	mm	16	21	24	30	37	44	