



**Technical and Test Institute  
for Construction Prague**

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## European Technical Assessment

**ETA 15/0704  
of 22/10/2015**

**Technical Assessment Body issuing the ETA:** Technical and Test Institute  
for Construction Prague

**Trade name of the construction product**

High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter  
Grade JFEA410SFW  
steel bonded anchor

**Product family to which the construction  
product belongs**

Product area code: 33  
Bonded injection type anchor for use in  
cracked and non-cracked concrete

**Manufacturer**

JCP Owlett-Jaton.  
Opal Way, Stone Business Park,  
Stone, Staffordshire, ST15 0SW.  
United Kingdom

**Manufacturing plant**

JCP Plant 1 United Kingdom

**This European Technical Assessment  
contains**

22 pages including 18 Annexes which form  
an integral part of this assessment.

**This European Technical Assessment is  
issued in accordance with regulation  
(EU) No 305/2011, on the basis of**

ETAG 001-Part 1 and Part 5, edition 2013,  
used as European Assessment Document  
(EAD)

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## 1. Technical description of the product

The High Load Vinylester JFV380SF and High Load Vinylester Fast Cure / Winter Grade JFEA410SFW (faster curing time) with steel elements is bonded anchor (injection type).

Steel elements can be galvanized or stainless steel threaded rod or rebar.

Steel element is placed into a drilled hole filled with injection mortar. The steel element is anchored via the bond between metal part, injection mortar and concrete. The anchor is intended to be used with embedment depth from 8 diameters to 20 diameters.

The illustration and the description of the product are given in Annex A.

## 2. Specification of the intended use in accordance with the applicable EAD

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The provisions made in this European Technical Assessment are based on an assumed working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the products in relation to the expected economically reasonable working life of the works.

## 3. Performance of the product and references to the methods used for its assessment

### 3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for tension loads - threaded rod	See Annex C 1
Characteristic resistance for tension loads - rebar	See Annex C 2
Characteristic resistance for shear loads - threaded rod	See Annex C 3
Characteristic resistance for shear loads - rebar	See Annex C 4
Characteristic resistance for tension loads - threaded rod	See Annex C 5
Characteristic resistance for tension loads - rebar	See Annex C 6
Characteristic resistance for shear loads - threaded rod	See Annex C 7
Characteristic resistance for shear loads - rebar	See Annex C 8
Displacement for threaded rod	See Annex C 9
Displacement for rebar	See Annex C 10

### 3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorage satisfy requirements for Class A1
Resistance to fire	No performance assessed

### 3.3 Hygiene, health and environment (BWR 3)

Regarding dangerous substances contained in this European Technical Assessment, there may be requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

### 3.4 Safety in use (BWR 4)

For basic requirement safety in use the same criteria are valid as for Basic Requirement Mechanical resistance and stability.

### 3.5 Sustainable use of natural resources (BWR 7)

For the sustainable use of natural resources no performance was determined for this product.

### 3.6 General aspects relating to fitness for use

Durability and serviceability are only ensured if the specifications of intended use according to Annex B 1 are kept.

## 4. Assessment and verification of constancy of performance (AVCP) system applied with reference to its legal base

According to the Decision 96/582/EC of the European Commission<sup>1</sup> the system of assessment verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units	-	1

## 5. Technical details necessary for the implementation of the AVCP system, as provided in the applicable EAD

### 5.1 Tasks of the manufacturer

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European Technical Assessment.

The manufacturer may only use raw materials stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the control plan which is a part of the technical documentation of this European Technical Assessment. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited at Technical and Test Institute for Construction Prague.<sup>2</sup> The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

The manufacturer shall, on the basis of a contract, involve a body which is notified for the tasks referred to in section 4 in the field of anchors in order to undertake the actions laid down in section 5.2. For this purpose, the control plan referred to in this section and section 5.2 shall be handed over by the manufacturer to the notified body involved.

The manufacturer shall make a declaration of performance, stating that the construction product is in conformity with the provisions of this European Technical Assessment.

<sup>1</sup> Official Journal of the European Communities L 254 of 08.10.1996

<sup>2</sup> The control plan is a confidential part of the documentation of the European Technical Assessment, but not published together with the ETA and only handed over to the approved body involved in the procedure of AVCP.

## 5.2 Tasks of the notified bodies

The notified body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

The notified certification body involved by the manufacturer shall issue a certificate of constancy of performance of the product stating the conformity with the provisions of this European Technical Assessment.

In cases where the provisions of the European Technical Assessment and its control plan are no longer fulfilled the notified body shall withdraw the certificate of constancy of performance and inform Technical and Test Institute for Construction Prague without delay.

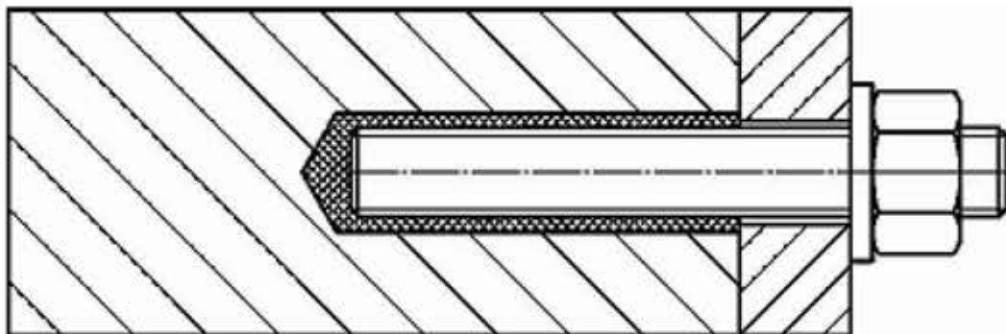
Issued in Prague on 22.10.2015

By

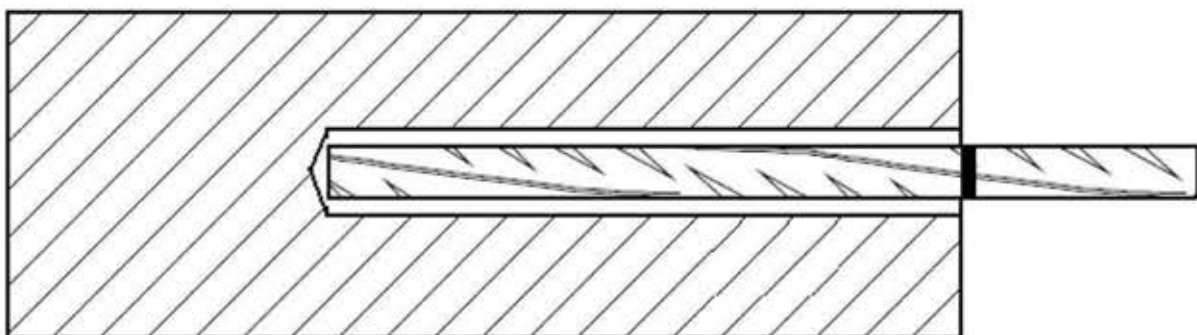
**Ing. Mária Schaan**

Head of the Technical Assessment Body

**Threaded rod**



**Reinforcing bar**



**High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW**

**Product description**  
Installed conditions

**Annex A 1**

**Coaxial cartridge**

High Load Vinylester JFV380SF, JFEA410SFW 150 ml  
380 ml  
400 ml  
410 ml



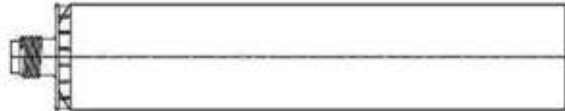
**Side by side cartridge**

High Load Vinylester JFV380SF, JFEA410SFW 350 ml



**Two part foil in a single piston component cartridge**

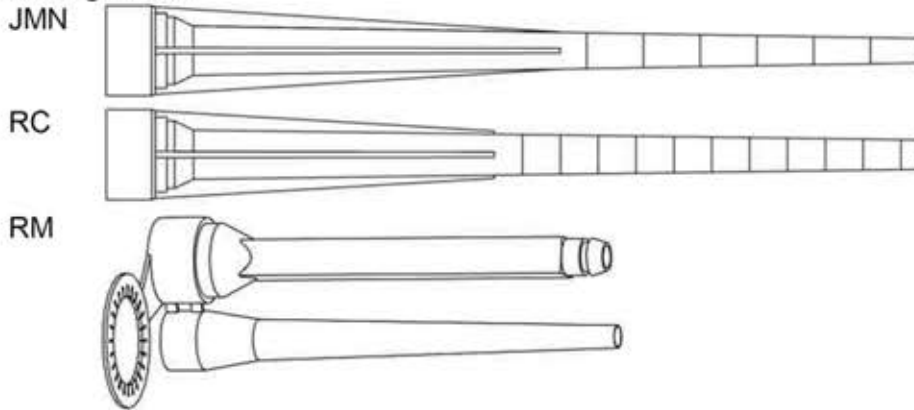
High Load Vinylester JFV380SF, JFEA410SFW 150 ml  
170 ml  
300 ml



**Marking of the mortar cartridges**

Identifying mark of the producer, Trade name, Charge code number, Storage life, Curing and processing time

**Mixing nozzle**

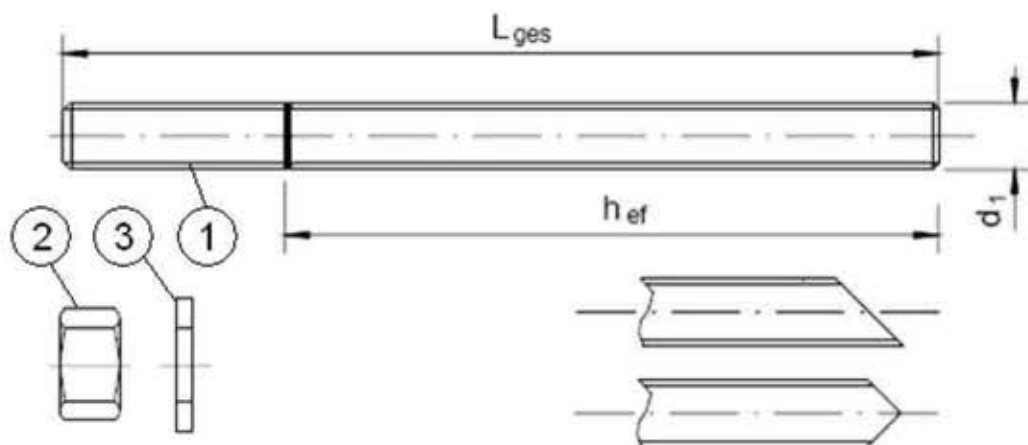


High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

Product description  
Injection system

Annex A 2

**Threaded rod M8, M10, M12, M16, M20, M24, M27, M30**



Standard commercial threaded rod with marked embedment depth

Part	Designation	Material
<b>Steel, zinc plated <math>\geq 5 \mu\text{m}</math> acc. to EN ISO 4042 or Steel, Hot-dip galvanized <math>\geq 40 \mu\text{m}</math> acc. to EN ISO 1461 and EN ISO 10684</b>		
1	Anchor rod	Steel, EN 10087 or EN 10263 Property class 4.6, 5.8, 8.8, 10.9* EN ISO 898-1
2	Hexagon nut EN ISO 4032	According to threaded rod, EN 20898-2
3	Washer EN ISO 887, EN ISO 7089, EN ISO 7093 or EN ISO 7094	According to threaded rod
<b>Stainless steel</b>		
1	Anchor rod	Material: A4-70, A4-80, EN ISO 3506
2	Hexagon nut EN ISO 4032	According to threaded rod
3	Washer EN ISO 887, EN ISO 7089, EN ISO 7093 or EN ISO 7094	According to threaded rod
<b>High corrosion resistant steel 1.4529</b>		
1	Anchor rod	Material: 1.4529, EN 10088-1
2	Hexagon nut EN ISO 4032	According to threaded rod
3	Washer EN ISO 887, EN ISO 7089, EN ISO 7093 or EN ISO 7094	According to threaded rod

\*Galvanized rod of high strength are sensitive to hydrogen induced brittle failure

**High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW**

**Product description**  
Threaded rod and materials

**Annex A 3**

Rebar Ø8, Ø10, Ø12, Ø16, Ø20, Ø25, Ø32



Standard commercial reinforcing bar with marked embedment depth

Product form		Bars and de-coiled rods	
Class		B	C
Characteristic yield strength $f_{yk}$ or $f_{0,2k}$ (MPa)		400 to 600	
Minimum value of $k = (f_t/f_y)_k$		$\geq 1,08$	$\geq 1,15$ < 1,35
Characteristic strain at maximum force $\epsilon_{uk}$ (%)		$\geq 5,0$	$\geq 7,5$
Bendability		Bend/Rebend test	
Maximum deviation from nominal mass (individual bar) (%)	Nominal bar size (mm)	$\pm 6,0$ $\pm 4,5$	
	$\leq 8$		
Bond: Minimum relative rib area, $f_{R,min}$	Nominal bar size (mm)	0,040 0,056	
	8 to 12		
	> 12		

High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

Product description  
Rebars and materials

Annex A 4



## Specifications of intended use

### Anchorage subject to:

- Static and quasi-static load.

### Base materials

- Non-cracked concrete.
- Cracked and non-cracked concrete for threaded rod size M10, M12, M16, M20, M24
- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum and C50/60 at maximum according EN 206-1:2000-12.

### Temperature range:

- -40°C to +80°C (max. short. term temperature +80°C and max. long term temperature +50°C)

### Use conditions (Environmental conditions)

- Structures subject to dry internal conditions (zinc coated steel, stainless steel, high corrosion resistance steel).
- Structures subject to external atmospheric exposure including industrial and marine environment, if no particular aggressive conditions exist (stainless steel, high corrosion resistance steel).
- Structures subject to permanently damp internal condition, if no particular aggressive conditions exist (stainless steel, high corrosion resistance steel).
- Structures subject to permanently damp internal condition, with particular aggressive conditions exist (high corrosion resistance steel).

Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

### Use categories:

- Category 2 – installation in dry or wet concrete or in flooded hole.

### Design:

- The anchorages are designed in accordance with the EOTA Technical Report TR 029 "Design of bonded anchors" under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings.

### Installation:

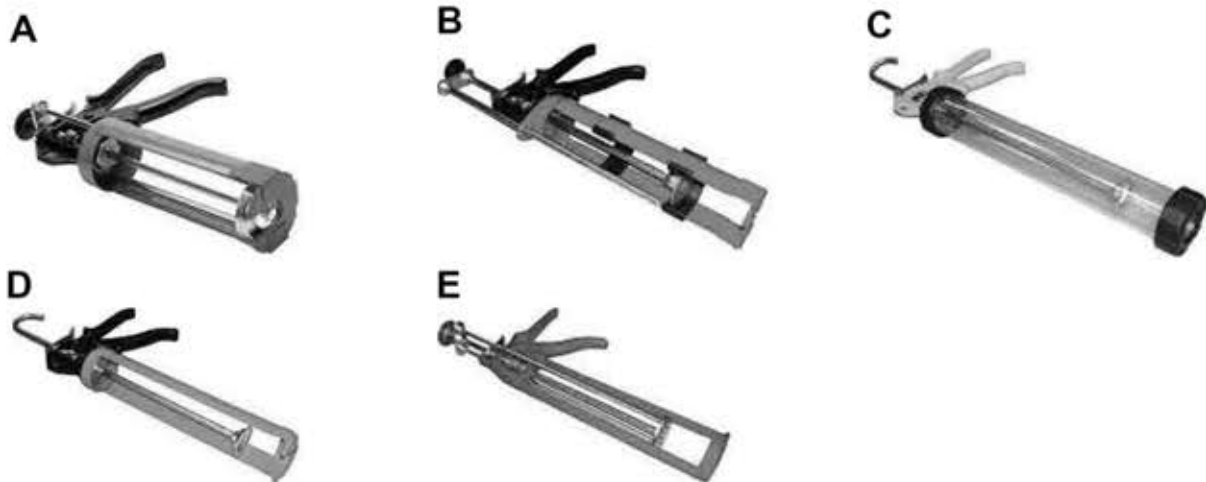
- Dry or wet concrete or flooded hole.
- Hole drilling by rotary drill mode.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

Intended use  
Specifications

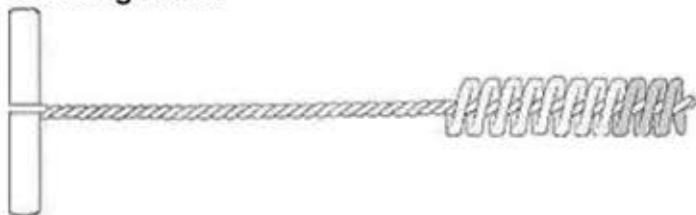
Annex B 1

### Applicator gun



Applicator gun	A	B	C	D	E
Cartridge	Coaxial 380ml 400ml 410ml	Side by side 350ml	Foil capsule 150ml 300ml	Foil capsule 150ml 300ml	Coaxial 150ml

### Cleaning brush



High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

Intended use  
Applicator guns  
Cleaning brush

Annex B 2

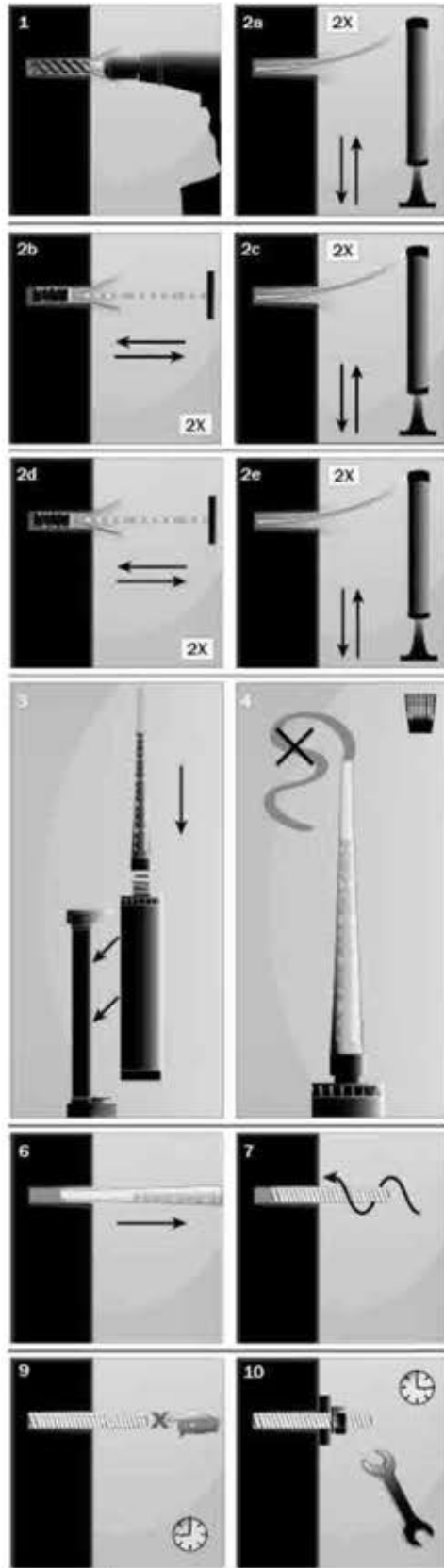
## Installation instructions

1. Drill the hole to the correct diameter and depth using a rotary percussion drilling machine.
2. Thoroughly clean the hole in the following sequence using a brush with the required extensions and a blow pump:

Blow Clean x2.  
 Brush Clean x2.  
 Blow Clean x2.  
 Brush Clean x2.  
 Blow Clean x2.

*Remove standing water from the hole prior to cleaning to achieve maximum performance.*

3. Select the appropriate static mixer nozzle for the installation, open the cartridge/cut foil pack and screw nozzle onto the mouth of the cartridge. Insert the cartridge into a good quality applicator (gun).
4. Extrude the first part of the cartridge to waste until an even colour has been achieved without streaking in the resin.
5. If necessary, cut the extension tube to the depth of the hole and push onto the end of the mixer nozzle, and fit the correct resin stopper to the other end.
6. Insert the mixer nozzle (or the extension tube with resin stopper when necessary) to the bottom of the hole. Begin to extrude the resin and slowly withdraw the mixer nozzle from the hole ensuring that there are no air voids as the mixer nozzle is withdrawn. Fill the hole to approximately 1/2 to 3/4 full and withdraw the nozzle completely.
7. Insert the clean threaded bar, free from oil or other release agents, to the bottom of the hole using a back and forth twisting motion ensuring all the threads are thoroughly coated. Adjust to the correct position within the stated working time.
8. Excess resin will be expelled from the hole evenly around the steel element showing that the hole is full.  
 This excess resin should be removed from around the mouth of the hole before it sets.
9. Leave the anchor to cure.  
 Do not disturb the anchor until the appropriate loading time has elapsed depending on the substrate conditions and ambient temperature.
10. Attach the fixture and tighten the nut to the recommended torque.  
**Do not overtighten.**



**High Load Vinylester JFV380SF,  
 High Load Vinylester Fast Cure / Winter Grade JFEA410SFW**

**Intended use**  
 Installation procedure

**Annex B 3**

**Table B1: Installation parameters of threaded rod**

Size		M8	M10	M12	M16	M20	M24	M27	M30
Nominal drill hole diameter	$\varnothing d_0$ [mm]	10	12	14	18	22	26	30	35
Diameter of cleaning brush	$d_b$ [mm]	14	14	20	20	29	29	40	40
Torque moment	$T_{inst}$ [Nm]	10	20	40	80	150	200	240	275
$h_{ef,min} = 8d$									
Depth of drill hole	$h_0$ [mm]	64	80	96	128	160	192	216	240
Minimum edge distance	$c_{min}$ [mm]	35	40	50	65	80	96	110	120
Minimum spacing	$s_{min}$ [mm]	35	40	50	65	80	96	110	120
Minimum thickness of member	$h_{min}$ [mm]	$h_{ef} + 30 \text{ mm} \geq 100 \text{ mm}$				$h_{ef} + 2d_0$			
$h_{ef,max} = 20d$									
Depth of drill hole	$h_0$ [mm]	160	200	240	320	400	480	540	600
Minimum edge distance	$c_{min}$ [mm]	80	100	120	160	200	240	270	300
Minimum spacing	$s_{min}$ [mm]	80	100	120	160	200	240	270	300
Minimum thickness of member	$h_{min}$ [mm]	$h_{ef} + 30 \text{ mm} \geq 100 \text{ mm}$				$h_{ef} + 2d_0$			

**Table B2: Installation parameters of rebar**

Size		Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32	
Nominal drill hole diameter	$\varnothing d_0$ [mm]	12	14	16	20	25	32	40	
Diameter of cleaning brush	$d_b$ [mm]	14	14	19	22	29	40	42	
$h_{ef,min} = 8d$									
Depth of drill hole	$h_0$ [mm]	64	80	96	128	160	200	256	
Minimum edge distance	$c_{min}$ [mm]	35	40	50	65	80	100	130	
Minimum spacing	$s_{min}$ [mm]	35	40	50	65	80	100	130	
Minimum thickness of member	$h_{min}$ [mm]	$h_{ef} + 30 \text{ mm} \geq 100 \text{ mm}$				$h_{ef} + 2d_0$			
$h_{ef,max} = 20d$									
Depth of drill hole	$h_0$ [mm]	160	200	240	320	400	500	640	
Minimum edge distance	$c_{min}$ [mm]	80	100	120	160	200	250	320	
Minimum spacing	$s_{min}$ [mm]	80	100	120	160	200	250	320	
Minimum thickness of member	$h_{min}$ [mm]	$h_{ef} + 30 \text{ mm} \geq 100 \text{ mm}$				$h_{ef} + 2d_0$			

**Table B3: Cleaning**

All diameters
- 2 x blowing
- 2 x brushing
- 2 x blowing
- 2 x brushing
- 2 x blowing

**Table B4: Minimum curing time**

High Load Vinylester JFV380SF		
Application temperature	Processing time	Load time
+5 to +10°C	10 mins	145 mins
+10 to +15°C	8 mins	85 mins
+15 to +20°C	6 mins	75 mins
+20 to +25°C	5 mins	50 mins
+25 to +30°C	4 mins	40 mins

Processing time refers to the highest temperature in the range.

Load time refers to the lowest temperature in the range.

Cartridge must be conditioned to a minimum +5°C.

High Load Vinylester Fast Cure / Winter Grade JFEA410SFW		
Application temperature	Processing time	Load time
-10 to -5°C	50 mins	12 hours
-5 to 0°C	15 mins	100 mins
0 to +5°C	10 mins	75 mins
+5 to +20°C	5 mins	50 mins
+20°C	100 second	20 mins

Processing time refers to the highest temperature in the range.

Load time refers to the lowest temperature in the range.

Cartridge must be conditioned to a minimum 0°C.

**High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW**

**Intended use**  
Installation parameters  
Curing time

**Annex B 4**

**Table C1: Design method TR 029**

Characteristic values of resistance to tension load of threaded rod

Steel failure – Characteristic resistance										
Size			M8	M10	M12	M16	M20	M24	M27	M30
Steel grade 4.6	$N_{RK,s}$	[kN]	15	23	34	63	98	141	184	224
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	2							
Steel grade 5.8	$N_{RK,s}$	[kN]	18	29	42	79	123	177	230	281
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5							
Steel grade 8.8	$N_{RK,s}$	[kN]	29	46	67	126	196	282	367	449
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5							
Steel grade 10.9	$N_{RK,s}$	[kN]	37	58	84	157	245	353	459	561
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,4							
Stainless steel grade A4-70	$N_{RK,s}$	[kN]	26	41	59	110	172	247	321	393
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,9							
Stainless steel grade A4-80	$N_{RK,s}$	[kN]	29	46	67	126	196	282	367	449
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,6							
Stainless steel grade 1.4529	$N_{RK,s}$	[kN]	26	41	59	110	172	247	321	393
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5							

Combined pullout and concrete cone failure in non-cracked concrete C20/25											
Size			M8	M10	M12	M16	M20	M24	M27	M30	
Characteristic bond resistance in non-cracked concrete											
Dry and wet concrete	$\tau_{RK}$	[N/mm <sup>2</sup> ]	11	10	9,5	9	8,5	8	6,5	5,5	
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,8 <sup>2)</sup>							2,1 <sup>3)</sup>	
Flooded hole	$\tau_{RK}$	[N/mm <sup>2</sup> ]	9	8	7,5	7	7	6	/		
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	2,1 <sup>3)</sup>								
Factor for concrete C50/60	$\psi_c$	[-]	1								

Combined pullout and concrete cone failure in cracked concrete C20/25												
Size			M10	M12	M16	M20	M24					
Characteristic bond resistance in cracked concrete												
Dry and wet concrete	$\tau_{RK}$	[N/mm <sup>2</sup> ]	5	5	5	4,5	4,5					
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,8 <sup>2)</sup>									
Flooded hole	$\tau_{RK}$	[N/mm <sup>2</sup> ]	5	5	5	4,5	4,5					
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	2,1 <sup>3)</sup>									
Factor for cracked concrete	C30/37	$\psi_c$	[-]	1,12								
	C40/50			1,23								
	C50/60			1,30								

Splitting failure										
Size			M8	M10	M12	M16	M20	M24	M27	M30
Edge distance	$c_{cr,sp}$	[mm]	1,5 $h_{ef}$							
Spacing	$s_{cr,sp}$	[mm]	3,0 $h_{ef}$							
Partial safety factor	$\gamma_{Msp}^{1)}$	[-]	1,8							

1) In absence of national regulations

2) The partial safety factor  $\gamma_2=1,2$  is included3) The partial safety factor  $\gamma_2=1,4$  is included

High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

**Performances**

Design according to TR 029

Characteristic resistance for tension loads - threaded rod

**Annex C 1**

**Table C2: Design method TR 029**

Characteristic values of resistance to tension load of rebar

Steel failure – Characteristic resistance									
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Rebar BSt 500 S	$N_{Rk,s}$	[kN]	28	43	62	111	173	270	442
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,4						

Combined pullout and concrete cone failure in non-cracked concrete C20/25									
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Characteristic bond resistance in non-cracked concrete									
Dry and wet concrete	$\tau_{Rk}$	[N/mm <sup>2</sup> ]	12	10	10	9	9	9	5,5
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,8 <sup>2)</sup>						
Flooded hole	$\tau_{Rk}$	[N/mm <sup>2</sup> ]	12	10	10	9	9	9	5,5
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	2,1 <sup>3)</sup>						
Factor for concrete C50/60	$\psi_c$	[-]	1						

Splitting failure									
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Edge distance	$c_{cr,sp}$	[mm]	1,5 $h_{ef}$						
Spacing	$s_{cr,sp}$	[mm]	3,0 $h_{ef}$						
Partial safety factor	$\gamma_{Msp}^{1)}$	[-]	1,8						

<sup>1)</sup> In absence of national regulations<sup>2)</sup> The partial safety factor  $\gamma_2=1,2$  is included<sup>3)</sup> The partial safety factor  $\gamma_2=1,4$  is included

High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

**Performances**

Design according to TR 029

Characteristic resistance for tension loads - rebar

**Annex C 2**

**Table C3: Design method TR 029**

Characteristic values of resistance to shear load of threaded rod

<b>Steel failure without lever arm</b>									
Size		M8	M10	M12	M16	M20	M24	M27	M30
Steel grade 4.6	$V_{RK,s}$ [kN]	7	12	17	31	49	71	92	112
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,67							
Steel grade 5.8	$V_{RK,s}$ [kN]	9	15	21	39	61	88	115	140
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,25							
Steel grade 8.8	$V_{RK,s}$ [kN]	15	23	34	63	98	141	184	224
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,25							
Steel grade 10.9	$V_{RK,s}$ [kN]	18	29	42	79	123	177	230	281
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,5							
Stainless steel grade A4-70	$V_{RK,s}$ [kN]	13	20	30	55	86	124	161	196
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,56							
Stainless steel grade A4-80	$V_{RK,s}$ [kN]	15	23	34	63	98	141	184	224
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,33							
Stainless steel grade 1.4529	$V_{RK,s}$ [kN]	13	20	30	55	86	124	161	196
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,25							

<b>Steel failure with lever arm</b>									
Size		M8	M10	M12	M16	M20	M24	M27	M30
Steel grade 4.6	$M^o_{RK,s}$ [N.m]	15	30	52	133	260	449	666	900
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,67							
Steel grade 5.8	$M^o_{RK,s}$ [N.m]	19	37	66	166	325	561	832	1125
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,25							
Steel grade 8.8	$M^o_{RK,s}$ [N.m]	30	60	105	266	519	898	1332	1799
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,25							
Steel grade 10.9	$M^o_{RK,s}$ [N.m]	37	75	131	333	649	1123	1664	2249
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,50							
Stainless steel grade A4-70	$M^o_{RK,s}$ [N.m]	26	52	92	233	454	786	1165	1574
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,56							
Stainless steel grade A4-80	$M^o_{RK,s}$ [N.m]	30	60	105	266	519	898	1332	1799
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,33							
Stainless steel grade 1.4529	$M^o_{RK,s}$ [N.m]	26	52	92	233	454	786	1165	1574
Partial safety factor	$\gamma_{Ms}^{1)}$ [-]	1,25							
<b>Concrete pryout failure</b>									
Factor $k$ from TR 029		2							
Design of bonded anchors, Part 5.2.3.3		2							
Partial safety factor	$\gamma_{Mp}^{1)}$ [-]	1,5							

<b>Concrete edge failure</b>									
Size		M8	M10	M12	M16	M20	M24	M27	M30
See section 5.2.3.4 of Technical Report TR 029 for the Design of Bonded Anchors									
Partial safety factor	$\gamma_{Mc}^{1)}$ [-]	1,5							

<sup>1)</sup> In absence of national regulations

**High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW**

**Performances**

Design according to TR 029

Characteristic resistance for shear loads - threaded rod

**Annex C 3**



**Table C4:** Design method TR 029  
Characteristic values of resistance to shear load of rebar

Steel failure without lever arm										
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32	
Rebar BSt 500 S	$V_{Rk,s}$	[kN]	14	22	31	55	86	135	221	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5							

Steel failure with lever arm										
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32	
Rebar BSt 500 S	$M^o_{Rk,s}$	[N.m]	33	65	112	265	518	1013	2122	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5							

Concrete pryout failure								
Factor $k$ from TR 029			2					
Design of bonded anchors, Part 5.2.3.3			2					
Partial safety factor	$\gamma_{Mp}^{1)}$	[-]	1,5					

Concrete edge failure									
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
See section 5.2.3.4 of Technical Report TR 029 for the Design of Bonded Anchors									
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,5						

<sup>1)</sup> In absence of national regulations

High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

**Performances**

Design according to TR 029  
Characteristic resistance for shear loads - rebar

**Annex C 4**



**Table C5: Design method CEN/TS 1992-4**

Characteristic values of resistance to tension load of threaded rod

Steel failure – Characteristic resistance											
Size			M8	M10	M12	M16	M20	M24	M27	M30	
Steel grade 4.6	$N_{RK,S}$	[kN]	15	23	34	63	98	141	184	224	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	2								
Steel grade 5.8	$N_{RK,S}$	[kN]	18	29	42	79	123	177	230	281	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5								
Steel grade 8.8	$N_{RK,S}$	[kN]	29	46	67	126	196	282	367	449	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5								
Steel grade 10.9	$N_{RK,S}$	[kN]	37	58	84	157	245	353	459	561	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,4								
Stainless steel grade A4-70	$N_{RK,S}$	[kN]	26	41	59	110	172	247	321	393	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,9								
Stainless steel grade A4-80	$N_{RK,S}$	[kN]	29	46	67	126	196	282	367	449	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,6								
Stainless steel grade 1.4529	$N_{RK,S}$	[kN]	26	41	59	110	172	247	321	393	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5								

Combined pullout and concrete cone failure in non-cracked concrete C20/25											
Size			M8	M10	M12	M16	M20	M24	M27	M30	
Characteristic bond resistance in non-cracked concrete											
Dry and wet concrete	$TR_k$	[N/mm <sup>2</sup> ]	11	10	9,5	9	8,5	8	6,5	5,5	
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,8 <sup>2)</sup>							2,1 <sup>3)</sup>	
Flooded hole	$TR_k$	[N/mm <sup>2</sup> ]	9	8	7,5	7	7	6			
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	2,1 <sup>3)</sup>								
Factor for concrete C50/60	$\psi_c$	[-]	1								
Factor according to CEN/TS 1992-4-5 Section 6.2.2	$k_8$		10,1								

Combined pullout and concrete cone failure in cracked concrete C20/25											
Size			M10	M12	M16	M20	M24				
Characteristic bond resistance in cracked concrete											
Dry and wet concrete	$TR_k$	[N/mm <sup>2</sup> ]	5	5	5	4,5	4,5				
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,8 <sup>2)</sup>								
Flooded hole	$TR_k$	[N/mm <sup>2</sup> ]	5	5	5	4,5	4,5				
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	2,1 <sup>3)</sup>								
Factor for cracked concrete C30/37	$\psi_c$	[-]	1,12								
Factor for cracked concrete C40/50	$\psi_c$	[-]	1,23								
Factor for cracked concrete C50/60	$\psi_c$	[-]	1,30								
Factor according to CEN/TS 1992-4-5 Section 6.2.2	$k_8$		7,2								

Concrete cone failure											
Size			M8	M10	M12	M16	M20	M24	M27	M30	
Factor according to CEN/TS 1992-4-5 Section 6.2.3	$k_{ucr}$		10,1								
	$k_{cr}$		7,2								
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$								
Spacing	$s_{cr,N}$	[mm]	3,0 $h_{ef}$								
Splitting failure											
Edge distance	$c_{cr,sp}$	[mm]	1,5 $h_{ef}$								
Spacing	$s_{cr,sp}$	[mm]	3,0 $h_{ef}$								
Partial safety factor	$\gamma_{Msp}^{1)}$	[-]	1,8								

<sup>1)</sup> In absence of national regulations

<sup>2)</sup> The partial safety factor  $\gamma_2=1,2$  is included

<sup>3)</sup> The partial safety factor  $\gamma_2=1,4$  is included

**High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW**
**Performances**

Design according to CEN/TS 1992-4

Characteristic resistance for tension loads - threaded rod

**Annex C 5**

**Table C6: Design method CEN/TS 1992-4**  
 Characteristic values of resistance to tension load of rebar

<b>Steel failure – Characteristic resistance</b>									
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Rebar BSt 500 S	$N_{Rk,s}$	[kN]	28	43	62	111	173	270	442
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,4						
<b>Combined pullout and concrete cone failure in non-cracked concrete C20/25</b>									
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
<b>Characteristic bond resistance in non-cracked concrete</b>									
Dry and wet concrete	$\tau_{Rk}$	[N/mm <sup>2</sup> ]	12	10	10	9	9	9	5,5
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,8 <sup>2)</sup>						
Flooded hole	$\tau_{Rk}$	[N/mm <sup>2</sup> ]	12	10	10	9	9	9	5,5
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	2,1 <sup>3)</sup>						
Factor for concrete C50/60	$\psi_c$	[-]	1						
Factor according to CEN/TS 1992-4-5 Section 6.2.2	$k_8$		10,1						
<b>Concrete cone failure</b>									
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Factor according to CEN/TS 1992-4-5 Section 6.2.3	$k_{ucr}$		10,1						
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$						
Spacing	$s_{cr,N}$	[mm]	3,0 $h_{ef}$						
<b>Splitting failure</b>									
Edge distance	$c_{cr,sp}$	[mm]	1,5 $h_{ef}$						
Spacing	$s_{cr,sp}$	[mm]	3,0 $h_{ef}$						
Partial safety factor	$\gamma_{Msp}^{1)}$	[-]	1,8						

<sup>1)</sup> In absence of national regulations

<sup>2)</sup> The partial safety factor  $\gamma_s=1,2$  is included

<sup>3)</sup> The partial safety factor  $\gamma_s=1,4$  is included

High Load Vinylester JFV380SF,  
 High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

**Performances**

Design according to CEN/TS 1992-4  
 Characteristic resistance for tension loads - rebar

**Annex C 6**

**Table C7: Design method CEN/TS 1992-4**

Characteristic values of resistance to shear load of threaded rod

<b>Steel failure without lever arm</b>											
<b>Size</b>			<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>	<b>M27</b>	<b>M30</b>	
Steel grade <b>4.6</b>	$V_{Rk,s}$	[kN]	7	12	17	31	49	71	92	112	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,67								
Steel grade <b>5.8</b>	$V_{Rk,s}$	[kN]	9	15	21	39	61	88	115	140	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,25								
Steel grade <b>8.8</b>	$V_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,25								
Steel grade <b>10.9</b>	$V_{Rk,s}$	[kN]	18	29	42	79	123	177	230	281	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5								
Stainless steel grade <b>A4-70</b>	$V_{Rk,s}$	[kN]	13	20	30	55	86	124	161	196	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,56								
Stainless steel grade <b>A4-80</b>	$V_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,33								
Stainless steel grade <b>1.4529</b>	$V_{Rk,s}$	[kN]	13	20	30	55	86	124	161	196	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,25								
Ductility factor according to CEN/TS 1992-4-5 Section 6.3.2.1	$k_2$		0,8								
<b>Steel failure with lever arm</b>											
<b>Size</b>			<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>	<b>M27</b>	<b>M30</b>	
Steel grade <b>4.6</b>	$M^o_{Rk,s}$	[N.m]	15	30	52	133	260	449	666	900	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,67								
Steel grade <b>5.8</b>	$M^o_{Rk,s}$	[N.m]	19	37	66	166	325	561	832	1125	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,25								
Steel grade <b>8.8</b>	$M^o_{Rk,s}$	[N.m]	30	60	105	266	519	898	1332	1799	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,25								
Steel grade <b>10.9</b>	$M^o_{Rk,s}$	[N.m]	37	75	131	333	649	1123	1664	2249	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,50								
Stainless steel grade <b>A4-70</b>	$M^o_{Rk,s}$	[N.m]	26	52	92	233	454	786	1165	1574	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,56								
Stainless steel grade <b>A4-80</b>	$M^o_{Rk,s}$	[N.m]	30	60	105	266	519	898	1332	1799	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,33								
Stainless steel grade <b>1.4529</b>	$M^o_{Rk,s}$	[N.m]	26	52	92	233	454	786	1165	1574	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,25								
<b>Concrete pryout failure</b>											
Factor according to CEN/TS 1992-4-5 Section 6.3.3	$k_3$		2,0								
Partial safety factor	$\gamma_{Mp}^{1)}$	[-]	1,5								
<b>Concrete edge failure</b>											
<b>Size</b>			<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>	<b>M27</b>	<b>M30</b>	
See section 6.3.4 of CEN/TS 1992-4-5											
Effective length of anchor	$l_f$	[mm]	$l_f = \min(h_{ef}; 8 d_{nom})$								
Outside diameter of anchor	$d_{nom}$	[mm]	8	10	12	16	20	24	27	30	
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,5								

<sup>1)</sup> In absence of national regulations

**High Load Vinylester JFV380SF,**  
**High Load Vinylester Fast Cure / Winter Grade JFEA410SFW**

**Performances**

Design according to CEN/TS 1992-4  
 Characteristic resistance for shear loads - threaded rod

**Annex C 7**

**Table C8: Design method CEN/TS 1992-4**  
 Characteristic values of resistance to shear load of rebar

<b>Steel failure without lever arm</b>										
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32	
Rebar BSt 500 S	$V_{Rk,s}$	[kN]	14	22	31	55	86	135	221	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5							
Ductility factor according to CEN/TS 1992-4-5 Section 6.3.2.1	$k_2$		0,8							
<b>Steel failure with lever arm</b>										
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32	
Rebar BSt 500 S	$M^0_{Rk,s}$	[N.m]	33	65	112	265	518	1013	2122	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5							
<b>Concrete pryout failure</b>										
Factor according to CEN/TS 1992-4-5 Section 6.3.3	$k_3$		2,0							
Partial safety factor	$\gamma_{Mp}^{1)}$	[-]	1,5							
<b>Concrete edge failure</b>										
Size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32	
See section 6.3.4 of CEN/TS 1992-4-5										
Effective length of anchor	$l_f$	[mm]	$l_f = \min(h_{ef}; 8 d_{nom})$							
Outside diameter of anchor	$d_{nom}$	[mm]	8	10	12	16	20	24	30	
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,5							





<sup>1)</sup> In absence of national regulations

**High Load Vinylester JFV380SF,**  
**High Load Vinylester Fast Cure / Winter Grade JFEA410SFW**

**Performances**  
 Design according to CEN/TS 1992-4  
 Characteristic resistance for shear loads - rebar

**Annex C 8**

**Table C9:** Displacement of threaded rod under tension and shear load

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete										
Tension load	F	[kN]	6,3	7,9	11,9	15,9	23,8	29,8	37,7	45,6
Displacement	$\delta_{N0}$	[mm]	0,3	0,3	0,3	0,3	0,4	0,5	0,5	0,5
		[mm]	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Shear load	F	[kN]	3,1	5,0	7,2	13,5	21,0	30,3	39,4	48,0
Displacement	$\delta_{V0}$	[mm]	1,5	1,5	1,5	1,5	2,0	2,5	2,5	2,5
		[mm]	2,3	2,3	2,3	2,3	3,0	3,8	3,8	3,8
Cracked concrete										
Tension load	F	[kN]		5,1	7,4	13,1	20,5	24,6		
Displacement	$\delta_{N0}$	[mm]		0,4	0,7	0,7	0,7	0,6		

High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

**Performances**  
Displacement for threaded rod

**Annex C 9**

**Table C10:** Displacement of rebar under tension and shear load

Rebar size			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Non-cracked concrete									
Tension load	F	[kN]	7,9	9,9	13,9	23,8	29,8	55,6	55,6
Displacement	$\delta_{N0}$	[mm]	0,3	0,3	0,3	0,4	0,4	0,5	0,5
	$\delta_{N_{x_0}}$	[mm]	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Shear load	F	[kN]	5,9	9,3	13,3	23,7	37,0	57,9	94,8
Displacement	$\delta_{V0}$	[mm]	0,3	0,4	0,4	0,4	0,4	0,5	0,9
	$\delta_{V_{x_0}}$	[mm]	0,5	0,6	0,6	0,6	0,6	0,8	1,4

High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW

Performances  
Displacement for rebar

**Annex C 10**





**TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.**  
**Technical and Test Institute for Construction Prague**

Akreditovaná zkušební laboratoř, Autorizovaná osoba, Notifikovaná osoba, Oznamovaný subjekt, Subjekt pro technické posuzování, Certifikační orgán, Inspekční orgán / Accredited Testing Laboratory, Authorized Body, Notified Body, Technical Assessment Body, Certification Body, Inspection Body, Prosecká 811/76a, 190 00 Praha 9 - Prosek, Czech Republic

# CERTIFICATE OF CONSTANCY OF PERFORMANCE

No. 1020 – CPR – 090-034765

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product:

**High Load Vinylester JFV380SF,  
High Load Vinylester Fast Cure / Winter Grade JFEA410SFW**  
Bonded injection type anchor for use in cracked and non-cracked concrete

produced by or for

**JCP Owlett-Jaton**

Opal Way, Stone Business Park Stone, Staffordshire, ST15 0SW, United Kingdom

and produced in the manufacturing plant

**JCP Owlett-Jaton**

JCP Plant 1 United Kingdom

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in the ETA

**ETA 15/0704**

under system 1 for the performances set out in this certificate are applied and that


**the construction product fulfils all the prescribed requirements for these performances.**

This certificate was first issued on 10<sup>th</sup> November 2015 and remains valid as long as the ETA remains valid and the manufacturing conditions in the plant or the factory production control itself are not modified significantly, unless suspended or withdrawn by the product certification body.

The stamp of the Notified Body 1020

Prague, 10<sup>th</sup> November 2015



  
Ing. Jozef Pôbiš  
Manager of the Notified Body

Supplied By

**FFT**

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# SAFETY DATA SHEET

## Vinylester Injection Resin

### PART A

#### SECTION 1: Identification of the substance/mixture and of the company/undertaking

##### 1.1. Product identifier

Product name                      Vinylester Injection Resin  
 Product number                    JFV300SF and JFV380SF and JFEA410SFW

##### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses                      Resin.

##### 1.3. Details of the supplier of the safety data sheet

Supplier                                JCP Construction Products  
     Unit 14 Teddington Business Park  
     Station Rd Teddington TW11 9BQ  
  
     Tel +44 208 943 1800  
     Fax +44 208 943 1140

Web                                        www.jcpfixings.co.uk

Contact person                        jcpenquiries@owlett-jaton.com

##### 1.4. Emergency telephone number

Emergency telephone                Tel +44 208 943 1800 Monday to Friday 9.00 to 5.00

#### SECTION 2: Hazards identification

##### 2.1. Classification of the substance or mixture

###### Classification (EC 1272/2008)

Physical hazards                      Flam. Liq. 3 - H226  
 Health hazards                        Eye Irrit. 2 - H319 Skin Sens. 1 - H317  
 Environmental hazards                Not Classified

Human health                         Vapours may irritate throat/respiratory system. May irritate eyes and skin. May cause skin sensitisation or allergic reactions in sensitive individuals.

##### 2.2. Label elements

###### Pictogram



Signal word                              Warning

Hazard statements                    H226 Flammable liquid and vapour.  
     H317 May cause an allergic skin reaction.  
     H319 Causes serious eye irritation.

Supplied By



## Vinylester Injection Resin

<b>Precautionary statements</b>	<p>P261 Avoid breathing vapour/ spray.</p> <p>P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.</p> <p>P302+P352 IF ON SKIN: Wash with plenty of water.</p> <p>P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.</p> <p>P501 Dispose of contents/ container in accordance with national regulations.</p>
<b>Contains</b>	<p>2-HYDROXYPROPYL METHACRYLATE, REACTION MASS OF 2,2'-[(4-METHYLPHENYL)IMINO] BISETHANOL AND ETHANOL 2-[[2-(2-HYDROXYETHOXY)ETHYL](4-METHYLPHENYL)AMINO]-</p>
<b>Supplementary precautionary statements</b>	<p>P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</p> <p>P233 Keep container tightly closed.</p> <p>P264 Wash contaminated skin thoroughly after handling.</p> <p>P333+P313 If skin irritation or rash occurs: Get medical advice/ attention.</p> <p>P337+P313 If eye irritation persists: Get medical advice/ attention.</p> <p>P403+P235 Store in a well-ventilated place. Keep cool.</p>

### 2.3. Other hazards

## SECTION 3: Composition/Information on ingredients

### 3.2. Mixtures

<b>2-HYDROXYPROPYL METHACRYLATE</b>	<b>5-10%</b>
CAS number: 923-26-2	EC number: 213-090-3
<b>Classification</b>	
Eye Irrit. 2 - H319	
Skin Sens. 1 - H317	
<b>VINYL TOLUENE</b>	<b>5-10%</b>
CAS number: 25013-15-4	EC number: 246-562-2
	REACH registration number: 01-2119622074-50-XXXX
<b>Classification</b>	
Flam. Liq. 3 - H226	
Acute Tox. 4 - H332	
Skin Irrit. 2 - H315	
Eye Irrit. 2 - H319	
Asp. Tox. 1 - H304	

# Vinylester Injection Resin

REACTION MASS OF 2,2'-[(4-METHYLPHENYL) IMINO]

<0.5%

BISETHANOL AND ETHANOL 2-[[2-(2-

HYDROXYETHOXY)ETHYL](4-METHYLPHENYL)AMINO]-

CAS number: 103671-44-9

EC number: 911-490-9

REACH registration number: 01-2119979579-10-XXXX

## Classification

Acute Tox. 4 - H302

Skin Irrit. 2 - H315

Eye Dam. 1 - H318

Skin Sens. 1 - H317

Aquatic Chronic 3 - H412

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

<b>Inhalation</b>	Move affected person to fresh air at once. Get medical attention if any discomfort continues.
<b>Ingestion</b>	Never give anything by mouth to an unconscious person. Do not induce vomiting. Rinse mouth thoroughly with water. Get medical attention if any discomfort continues.
<b>Skin contact</b>	Remove affected person from source of contamination. Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues.
<b>Eye contact</b>	Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention if irritation persists after washing. Show this Safety Data Sheet to the medical personnel.

### 4.2. Most important symptoms and effects, both acute and delayed

<b>Inhalation</b>	Irritation of nose, throat and airway.
<b>Ingestion</b>	May cause discomfort if swallowed.
<b>Skin contact</b>	May cause skin irritation/eczema.
<b>Eye contact</b>	Irritation of eyes and mucous membranes.

### 4.3. Indication of any immediate medical attention and special treatment needed

<b>Notes for the doctor</b>	No specific recommendations. If in doubt, get medical attention promptly.
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## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

<b>Suitable extinguishing media</b>	Extinguish with foam, carbon dioxide or dry powder.
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### 5.2. Special hazards arising from the substance or mixture

<b>Specific hazards</b>	No unusual fire or explosion hazards noted.
<b>Hazardous combustion products</b>	Oxides of carbon.

### 5.3. Advice for firefighters

<b>Protective actions during firefighting</b>	Avoid breathing fire gases or vapours.
---	--

# Vinylester Injection Resin

**Special protective equipment for firefighters** Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

**Personal precautions** Wear protective clothing as described in Section 8 of this safety data sheet.

### 6.2. Environmental precautions

**Environmental precautions** Avoid release to the environment.

### 6.3. Methods and material for containment and cleaning up

**Methods for cleaning up** Collect and place in suitable waste disposal containers and seal securely. For waste disposal, see Section 13.

### 6.4. Reference to other sections

**Reference to other sections** Wear protective clothing as described in Section 8 of this safety data sheet. For waste disposal, see Section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

**Usage precautions** Do not use in confined spaces without adequate ventilation and/or respirator.

### 7.2. Conditions for safe storage, including any incompatibilities

**Storage precautions** Store in tightly closed original container in a dry, cool and well-ventilated place. Keep away from oxidising materials, heat and flames.

**Storage class** Chemical storage.

### 7.3. Specific end use(s)

**Specific end use(s)** The identified uses for this product are detailed in Section 1.2.

## SECTION 8: Exposure Controls/personal protection

### 8.1. Control parameters

#### VINYL TOLUENE (CAS: 25013-15-4)

**DNEL** Industry - Inhalation; Long term systemic effects: 37 mg/m<sup>3</sup>  
Industry - Inhalation; Long term local effects: 37 mg/m<sup>3</sup>  
REACH dossier information

**PNEC** - Fresh water; 0.0498 mg/l  
- Marine water; 0.002 mg/l  
- Intermittent release; 0.013 mg/l  
- STP; 1 mg/l  
- Sediment (Freshwater); 0.684 mg/kg  
- Sediment (Marinewater); 0.0684 mg/kg  
- Soil; 0.133 mg/kg  
REACH dossier information

#### REACTION MASS OF 2,2'-[(4-METHYLPHENYL) IMINO] BISETHANOL AND ETHANOL 2-[[2-(2-HYDROXYETHOXY)ETHYL](4-METHYLPHENYL)AMINO]- (CAS: 103671-44-9)

**DNEL** - Inhalation; Long term : 9.8 mg/m<sup>3</sup>  
Workers - Dermal; Long term : 1.4 mg/kg



## Vinylester Injection Resin

### PNEC

- Fresh water; 0.048 mg/l
- Marine water; 0.0048 mg/l
- Intermittent release; 0.48 mg/l
- Sediment (Freshwater); 1.2 mg/kg
- Sediment (Marinewater); 0.12 mg/kg
- Soil; 0.21 mg/kg

### 8.2. Exposure controls

#### Protective equipment



#### Appropriate engineering controls

Provide adequate ventilation. Avoid inhalation of vapours. Observe any occupational exposure limits for the product or ingredients.

#### Eye/face protection

The following protection should be worn: Chemical splash goggles.

#### Hand protection

It is recommended that chemical-resistant, impervious gloves are worn.

#### Other skin and body protection

Wear appropriate clothing to prevent any possibility of skin contact.

#### Hygiene measures

DO NOT SMOKE IN WORK AREA! Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes contaminated. Promptly remove any clothing that becomes contaminated. Use appropriate skin cream to prevent drying of skin. When using do not eat, drink or smoke.

#### Respiratory protection

No specific recommendations. Respiratory protection may be required if excessive airborne contamination occurs.

#### Environmental exposure controls

Keep container tightly sealed when not in use.

## SECTION 9: Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

Appearance	Liquid
Colour	Beige.
Odour	Aromatic.
Odour threshold	Not determined.
pH	Not applicable.
Melting point	Not determined.
Initial boiling point and range	>165°C @
Flash point	53°C
Evaporation rate	Not determined.
Evaporation factor	Not determined.
Flammability (solid, gas)	Not determined.
Upper/lower flammability or explosive limits	Not determined.
Other flammability	Not determined.

## Vinylester Injection Resin

Vapour pressure	6 hPa @ 20°C
Vapour density	Not determined.
Relative density	1.65 - 1.75 @ 20°C
Bulk density	Not applicable.
Solubility(ies)	Insoluble in water
Partition coefficient	Not determined.
Auto-ignition temperature	Not determined.
Decomposition Temperature	Not determined.
Viscosity	> 60 S ISO2431
Explosive properties	No information available.
Oxidising properties	Does not meet the criteria for classification as oxidising.

### 9.2. Other information

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

**Reactivity** The following materials may react with the product: Organic peroxides/hydroperoxides.

### 10.2. Chemical stability

**Stability** Stable at normal ambient temperatures.

### 10.3. Possibility of hazardous reactions

**Possibility of hazardous reactions** Does not decompose when used and stored as recommended.

### 10.4. Conditions to avoid

**Conditions to avoid** Avoid excessive heat for prolonged periods of time.

### 10.5. Incompatible materials

**Materials to avoid** Organic peroxides/hydroperoxides.

### 10.6. Hazardous decomposition products

**Hazardous decomposition products** Oxides of carbon.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### Acute toxicity - inhalation

ATE inhalation (vapours mg/l) 159.27

#### Skin sensitisation

Skin sensitisation Sensitising.

**Inhalation** Gas or vapour in high concentrations may irritate the respiratory system. Symptoms following overexposure may include the following: Coughing.

**Ingestion** May cause discomfort if swallowed.

**Skin contact** May cause sensitisation by skin contact. May cause irritation.

## Vinylester Injection Resin

Eye contact	Irritating to eyes.
Acute and chronic health hazards	Irritating to eyes. May cause sensitisation by skin contact.
Route of entry	Skin and/or eye contact.
Medical symptoms	Irritation of eyes and mucous membranes. Irritation of nose, throat and airway. Skin irritation.
Medical considerations	Skin disorders and allergies.

### Toxicological information on ingredients.

#### 2-HYDROXYPROPYL METHACRYLATE

##### Acute toxicity - oral

Acute toxicity oral (LD<sub>50</sub> mg/kg) 5,000.0

Species Rat

#### VINYL TOLUENE

##### Acute toxicity - inhalation

ATE inhalation (vapours mg/l) 11.0

##### Carcinogenicity

IARC carcinogenicity IARC Group 3 Not classifiable as to its carcinogenicity to humans.

## SECTION 12: Ecological Information

Ecotoxicity Not regarded as dangerous for the environment.

### 12.1. Toxicity

#### Ecological information on ingredients.

#### VINYL TOLUENE

Acute toxicity - fish LC50, 96 hours: 23.4 mg/l, Pimephales promelas (Fat-head Minnow)

### 12.2. Persistence and degradability

### 12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

Partition coefficient Not determined.

#### Ecological information on ingredients.

#### VINYL TOLUENE

Partition coefficient log Pow: 3.36

### 12.4. Mobility in soil

Mobility Not applicable.

### 12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

## Vinylester Injection Resin

### 12.6. Other adverse effects

Other adverse effects Not applicable.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

General information Dispose of waste product or used containers in accordance with local regulations

Disposal methods Dispose of waste via a licensed waste disposal contractor.

## SECTION 14: Transport information

Road transport notes Not regulated.

Rail transport notes Not regulated.

### 14.1. UN number

UN No. (IMDG) 1866

UN No. (ICAO) 1866

### 14.2. UN proper shipping name

Proper shipping name (IMDG) RESIN SOLUTION

Proper shipping name (ICAO) RESIN SOLUTION

### 14.3. Transport hazard class(es)

IMDG class 3

ICAO class/division 3

Transport labels



### 14.4. Packing group

IMDG packing group III

ICAO packing group III

### 14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant  
No.

### 14.6. Special precautions for user

EmS F-E, S-E

### 14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Not relevant.

Annex II of MARPOL 73/78  
and the IBC Code

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU legislation (EU) No 2015/830



## Vinylester Injection Resin

**Guidance** Workplace Exposure Limits EH40.

### 15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

### Inventories

#### US - TSCA

All the ingredients are listed or exempt.

#### US - TSCA 12(b) Export Notification

None of the ingredients are listed or exempt.

## SECTION 16: Other information

<b>Revision comments</b>	NOTE: Lines within the margin indicate significant changes from the previous revision.
<b>Revision date</b>	26/05/2016
<b>Revision</b>	7
<b>Supersedes date</b>	08/03/2016
<b>SDS number</b>	20343
<b>Hazard statements in full</b>	<p>H226 Flammable liquid and vapour.  H302 Harmful if swallowed.  H304 May be fatal if swallowed and enters airways.  H315 Causes skin irritation.  H317 May cause an allergic skin reaction.  H318 Causes serious eye damage.  H319 Causes serious eye irritation.  H332 Harmful if inhaled.  H412 Harmful to aquatic life with long lasting effects.</p>

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.





**SAFETY DATA SHEET**  
**Vinylester Injection Resin**  
**PART B**

**SECTION 1: Identification of the substance/mixture and of the company/undertaking**

**1.1. Product identifier**

Product name                      Vinylester Injection Resin  
 Product number                    JFV300SF and JFV380SF and JFEA410SFW

**1.2. Relevant identified uses of the substance or mixture and uses advised against** Identified uses

Catalyst.

**1.3. Details of the supplier of the safety data sheet**

Supplier                              JCP Construction Products  
     Unit 14 Teddington Business Park  
     Station Rd Teddington TW11 9BQ

Tel +44 208 943 1800  
 Fax +44 208 943 1140

Web                                      www.jcpfixings.co.uk

Contact person                      jcpenquiries@owlett-jaton.com

**1.4. Emergency telephone number**

Emergency telephone              Tel +44 208 943 1800 Monday to Friday 9.00 to 5.00

**SECTION 2: Hazards identification**

**2.1. Classification of the substance or mixture**

**Classification (EC 1272/2008)**

Physical hazards                    Not Classified  
 Health hazards                      Eye Irrit. 2 - H319 Skin Sens. 1 - H317  
 Environmental hazards              Aquatic Acute 1 - H400 Aquatic Chronic 3 - H412

Human health                        May cause skin disorders if contact is repeated or prolonged. The product is irritating to eyes and skin.

Environmental                        The product contains a substance which is very toxic to aquatic organisms and which may cause long-term adverse effects in the aquatic environment.

Physicochemical                      Not considered to be a significant hazard due to the small quantities used.

**2.2. Label elements**

Pictogram



## Vinylester Injection Resin

<b>Signal word</b>	Warning
<b>Hazard statements</b>	H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H400 Very toxic to aquatic life. H412 Harmful to aquatic life with long lasting effects.
<b>Precautionary statements</b>	P273 Avoid release to the environment. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P302+P352 IF ON SKIN: Wash with plenty of water. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P333+P313 If skin irritation or rash occurs: Get medical advice/ attention. P501 Dispose of contents/ container in accordance with national regulations.
<b>Contains</b>	BENZOYL PEROXIDE
<b>Supplementary precautionary statements</b>	P264 Wash contaminated skin thoroughly after handling. P337+P313 If eye irritation persists: Get medical advice/ attention. P362+P364 Take off contaminated clothing and wash it before reuse. P391 Collect spillage. P411 Store at temperatures not exceeding 25°C/77°F.

### 2.3. Other hazards

## SECTION 3: Composition/information on ingredients

### 3.2. Mixtures

<b>BENZOYL PEROXIDE</b>			<b>10-15%</b>
CAS number: 94-36-0	EC number: 202-327-6	REACH registration number: 01-2119511472-50-XXXX	
M factor (Acute) = 10			
<b>Classification</b>			
Org. Perox. B - H241			
Eye Irrit. 2 - H319			
Skin Sens. 1 - H317			
Aquatic Acute 1 - H400			
<b>BENZOIC ACID,NONYL ESTER,BRANCHED AND LINEAR</b>			<b>5-10%</b>
CAS number: 670241-72-2	EC number: 447-010-5	REACH registration number: 01-0000018876-55-XXXX	
<b>Classification</b>			
Aquatic Chronic 2 - H411			

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

<b>Inhalation</b>	Move affected person to fresh air at once. Get medical attention if any discomfort continues.
<b>Ingestion</b>	Never give anything by mouth to an unconscious person. Do not induce vomiting. Rinse mouth thoroughly with water. Get medical attention if any discomfort continues.

## Vinylester Injection Resin

**Skin contact** Remove affected person from source of contamination. Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues.

**Eye contact** Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention if irritation persists after washing. Show this Safety Data Sheet to the medical personnel.

### 4.2. Most important symptoms and effects, both acute and delayed

**Ingestion** May cause discomfort if swallowed.

**Skin contact** Causes skin irritation.

**Eye contact** Irritation of eyes and mucous membranes.

### 4.3. Indication of any immediate medical attention and special treatment needed

**Notes for the doctor** No specific recommendations. If in doubt, get medical attention promptly.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

**Suitable extinguishing media** Extinguish with foam, carbon dioxide or dry powder.

### 5.2. Special hazards arising from the substance or mixture

**Specific hazards** No specific precautions due to the small quantities handled.

**Hazardous combustion products** Oxides of carbon.

### 5.3. Advice for firefighters

**Protective actions during firefighting** Avoid breathing fire gases or vapours.

**Special protective equipment for firefighters** Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

**Personal precautions** Wear protective clothing as described in Section 8 of this safety data sheet.

### 6.2. Environmental precautions

**Environmental precautions** Avoid release to the environment.

### 6.3. Methods and material for containment and cleaning up

**Methods for cleaning up** Collect and place in suitable waste disposal containers and seal securely. For waste disposal, see Section 13.

### 6.4. Reference to other sections

**Reference to other sections** Wear protective clothing as described in Section 8 of this safety data sheet. For waste disposal, see Section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

**Usage precautions** Keep away from heat, sparks and open flame.



# Vinylester Injection Resin

**Advice on general occupational hygiene** Do not eat, drink or smoke when using this product. No specific hygiene procedures recommended but good personal hygiene practices should always be observed when working with chemical products.

## 7.2. Conditions for safe storage, including any incompatibilities

**Storage precautions** Keep away from flammable and combustible materials. Store in closed original container at temperatures between 5°C and 25°C.

**Storage class** Chemical storage.

## 7.3. Specific end use(s)

**Specific end use(s)** The identified uses for this product are detailed in Section 1.2.

## SECTION 8: Exposure Controls/personal protection

### 8.1. Control parameters

#### Occupational exposure limits

#### BENZOYL PEROXIDE

Long-term exposure limit (8-hour TWA): WEL 5 mg/m<sup>3</sup>

WEL = Workplace Exposure Limit

#### BENZOYL PEROXIDE (CAS: 94-36-0)

<b>DNEL</b>	Industry - Dermal; Long term : 6.6 mg/kg/day Industry - Oral; Long term : 1.6 mg/kg/day Industry - Inhalation; Long term : 11.75 mg/m <sup>3</sup>
<b>PNEC</b>	- Fresh water; 0.000602 mg/l - Sediment (Freshwater); 0.338 mg/kg - STP; 0.35 mg/l - Marine water; 0.0000602 mg/l - Sediment (Marinewater); 0.0338 mg/kg

### 8.2. Exposure controls

#### Protective equipment



**Appropriate engineering controls**

Provide adequate ventilation.

**Eye/face protection**

The following protection should be worn: Chemical splash goggles.

**Hand protection**

Wear protective gloves made of the following material: Nitrile rubber.

**Other skin and body protection**

Wear appropriate clothing to prevent any possibility of skin contact.

**Hygiene measures**

Wash hands at the end of each work shift and before eating, smoking and using the toilet. **DO NOT SMOKE IN WORK AREA!**

**Respiratory protection**

No specific recommendations.

## SECTION 9: Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

**Appearance** Liquid

## Vinylester Injection Resin

Colour	Black.
Odour	Characteristic.
Odour threshold	Not determined.
pH	Not determined.
Melting point	Not applicable.
Initial boiling point and range	Not applicable.
Flash point	Not applicable.
Evaporation rate	Not determined.
Evaporation factor	Not determined.
Flammability (solid, gas)	Not determined.
Upper/lower flammability or explosive limits	Not determined.
Other flammability	Not determined.
Vapour pressure	Not determined.
Vapour density	Not determined.
Relative density	1.5 - 1.6
Bulk density	Not applicable.
Solubility(ies)	Not determined.
Partition coefficient	Not determined.
Auto-ignition temperature	Not determined.
Decomposition Temperature	>50°C
Viscosity	> 60 S ISO2431
Explosive properties	No information available.
Oxidising properties	Not determined.

### 9.2. Other information

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

**Reactivity** The following materials may react with the product: Acids. Alkalis. Amines. Strong reducing agents.

### 10.2. Chemical stability

**Stability** Stable at normal ambient temperatures and when used as recommended. Will decompose at temperatures exceeding 50°C.

### 10.3. Possibility of hazardous reactions

**Possibility of hazardous reactions** Will not polymerise.

### 10.4. Conditions to avoid

**Conditions to avoid** Avoid contact with strong reducing agents. Avoid heat. Avoid contact with acids and alkalis.

## Vinylester Injection Resin

### 10.5. Incompatible materials

**Materials to avoid** Strong reducing agents. Acids, non-oxidising. Acids - organic. Alkalis - inorganic. Alkalis - organic. Amines.

### 10.6. Hazardous decomposition products

**Hazardous decomposition products** Oxides of carbon.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### Skin sensitisation

**Skin sensitisation** Sensitising.

**Inhalation** No specific health hazards known.

**Ingestion** May cause discomfort if swallowed.

**Skin contact** Irritating to skin. May cause sensitisation by skin contact.

**Eye contact** Irritation of eyes and mucous membranes.

**Route of entry** Skin and/or eye contact.

**Medical symptoms** Skin irritation. Irritation of eyes and mucous membranes.

**Medical considerations** No information available.

#### Toxicological information on ingredients.

#### BENZOYL PEROXIDE

##### Acute toxicity - oral

**Acute toxicity oral (LD<sub>50</sub> mg/kg)** 950.0

**Species** Rat

##### Carcinogenicity

**IARC carcinogenicity** IARC Group 3 Not classifiable as to its carcinogenicity to humans.

## SECTION 12: Ecological Information

### 12.1. Toxicity

#### Ecological information on ingredients.

#### BENZOYL PEROXIDE

##### Acute aquatic toxicity

**LE(C)<sub>50</sub>** 0.01 < L(E)C50 ≤ 0.1

**M factor (Acute)** 10

**Acute toxicity - fish** LC50, 96 hours: 0.06 mg/l, Onchorhynchus mykiss (Rainbow trout)

**Acute toxicity - aquatic invertebrates** EC<sub>50</sub>, 48 hours: 0.11 mg/l, Daphnia magna

**Acute toxicity - aquatic plants** EC<sub>50</sub>, 72 hours: 0.07 mg/l, Selenastrum capricornutum

## Vinylester Injection Resin

### BENZOIC ACID,NONYL ESTER,BRANCHED AND LINEAR

<b>Acute toxicity - fish</b>	LC <sub>50</sub> , 24 hours: > 1.23 mg/l, Cyprinus carpio (Common carp)
	LC <sub>50</sub> , 48 hours: > 1.23 mg/l, Cyprinus carpio (Common carp)
	LC <sub>50</sub> , 72 hours: > 1.23 mg/l, Cyprinus carpio (Common carp)
	EC <sub>50</sub> , 96 hours: > 1.23 mg/l, Cyprinus carpio (Common carp)
	EC <sub>100</sub> , 96 hours: > 1.23 mg/l, Cyprinus carpio (Common carp)
NOEC, 96 hours: > 1.23 mg/l, Cyprinus carpio (Common carp)	
<b>Acute toxicity - aquatic invertebrates</b>	EC <sub>50</sub> , 24 hours: > 2.2 mg/l, Daphnia magna
	EC <sub>50</sub> , 48 hours: > 2.2 mg/l, Daphnia magna
	NOEC, 48 hours: > 2.2 mg/l, Daphnia magna
<b>Acute toxicity - microorganisms</b>	IC <sub>50</sub> , 3 hours: > 1000 mg/l, Activated sludge
	NOEC, 3 hours: > 1000 mg/l, Activated sludge

#### 12.2. Persistence and degradability

**Persistence and degradability** There are no data on the degradability of this product.

#### 12.3. Bioaccumulative potential

**Bioaccumulative potential** No data available on bioaccumulation.

**Partition coefficient** Not determined.

#### 12.4. Mobility in soil

**Mobility** Mobile. The product is partly miscible with water and may spread in the aquatic environment.

#### 12.5. Results of PBT and vPvB assessment

**Results of PBT and vPvB assessment** This product does not contain any substances classified as PBT or vPvB.

#### 12.6. Other adverse effects

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

**General information** Dispose of waste product or used containers in accordance with local regulations

**Disposal methods** Dispose of waste via a licensed waste disposal contractor.

### SECTION 14: Transport information

#### 14.1. UN number

UN No. (ADR/RID) 3082

UN No. (IMDG) 3082

UN No. (ICAO) 3082

UN No. (ADN) 3082

#### 14.2. UN proper shipping name

**Proper shipping name (ADR/RID)** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. BENZOYL PEROXIDE

**Proper shipping name (IMDG)** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. BENZOYL PEROXIDE

**Proper shipping name (ICAO)** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. BENZOYL PEROXIDE

**Proper shipping name (ADN)** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. BENZOYL PEROXIDE



## Vinylester Injection Resin

### 14.3. Transport hazard class(es)

ADR/RID class	9
ADR/RID classification code	M6
ADR/RID label	9
IMDG class	9
ICAO class/division	9
ADN class	9

#### Transport labels



### 14.4. Packing group

ADR/RID packing group	III
IMDG packing group	III
ADN packing group	III
ICAO packing group	III

### 14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant



### 14.6. Special precautions for user

EmS	F-A, S-F
ADR transport category	3
Emergency Action Code	+3Z
Hazard Identification Number (ADR/RID)	90
Tunnel restriction code	(E)

### 14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU legislation	(EU) No 2015/830
Guidance	Workplace Exposure Limits EH40.

### 15.2. Chemical safety assessment

No chemical safety assessment has been carried out.



# Vinylester Injection Resin

## Inventories

### US - TSCA

All the ingredients are listed or exempt.

### US - TSCA 12(b) Export Notification

None of the ingredients are listed or exempt.

## SECTION 16: Other information

Revision comments	NOTE: Lines within the margin indicate significant changes from the previous revision.
Revision date	06/03/2017
Revision	7
Supersedes date	26/05/2016
SDS number	20483
Hazard statements in full	H241 Heating may cause a fire or explosion. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H400 Very toxic to aquatic life. H411 Toxic to aquatic life with long lasting effects. H412 Harmful to aquatic life with long lasting effects.

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

# Declaration of Performance No. 1488-CPD-0359/W



Injection Resin JFV380SF, JFV300SF & JFEA410SFV Vinyl Ester Resin  
 JCP Construction Products,  
 Unit 14 Teddington Business Park, Station Rd, Teddington, Middlesex TW11 9BQ  
 Telephone +44 (0)208 943 1800

Intended use or uses of the products according to EAD 330499-00-0601	
Generic type	Bonded Anchor
Base material	Cracked and Non-cracked concrete C20/25 to C50/60 acc. EN 206-2:2003 The anchor may be installed in dry, wet, and flooded, holes.
Batch number	Marked on individual tubes
Plating finish	Steel, zinc plated $\geq 5 \mu\text{m}$ acc. to EN ISO 4042 or Steel, Hot-dip galvanized $\geq 40 \mu\text{m}$ acc. to EN ISO 1461 and EN ISO 10684
Steel elements	1) Galvanised carbon steel Grade 5.8, 8.8 and 10.9 to EN ISO 891-1 2) Stainless Steel 1.4401, 1.4404 or 1.457 Property class 70 or 80 to EN ISO 3506 3) High corrosion resistant steel 1.4529, EN 10088-1
Durability	1) Dry Internal conditions 2) Internal and external atmospheric exposure including industrial and marine environment, or exposure in permanently damp internal conditions, if no particularly aggressive conditions exist 3) Aggressive atmospheric conditions
Loading	Static, quasi-static
ETA 15/0704 issued by	ZUS
On the basis of	330499-00-0601
Certificate of Conformity 1020-CPR-090-034765 issued by	ZUS
Under system	1
Temperature range(s)	-40°C to +80°C (Max short term temperature +80°C and Max long term temperature +50°C)
Reaction to fire	Anchorage satisfies requirements for Class A1

Declared performances according to EAD 330499-00-0601

Essential Characteristics		Performance								
		M08	M10	M12	M16	M20	M24	M30		
Installation parameters										
$d_o$	Nominal diameter of drill bit	[mm]	10	12	14	18	22	26	35	
$d_f$	Fixture clearance hole	[mm]	10	12	14	18	22	26	35	
$d_b$	Bruah diameter	[mm]	14	14	20	20	29	29	40	
$h_{ef}$	Effective anchorage depth	[mm]	$h_{ef,min} = 8d, h_{ef,max} = 20d$							
$h_{min}$	Minimum thickness of concrete member	[mm]	$h_{ef} + 30\text{mm}, \text{min } 100\text{mm}$			$h_{ef} + 2 \cdot d_o$				
$T_{inst}$	Nominal torque moment	[mm]	10	20	40	80	150	200	275	
$S_{min}$	Minimum spacing	Minimum Embedment	[mm]	35	40	50	65	80	96	120
$C_{min}$	Minimum edged distance		[mm]	35	40	50	65	80	96	120
$S_{min}$	Minimum spacing	Maximum Embedment	[mm]	80	100	120	160	200	240	300
$C_{min}$	Minimum edged distance		[mm]	80	100	120	160	200	240	300
Tensile Steel failure										
NRk,s	Characteristic tensile resistance steel <b>Grade 5.8</b>	[kN]	18	29	42	79	123	177	281	
NRk,s	Characteristic tensile resistance steel <b>Grade 8.8</b>	[kN]	29	46	67	126	196	282	449	
$\gamma_{M,s}$	Partial safety factor		1.5							
NRk,s	Characteristic tensile resistance stainless steel <b>Grade A4-70</b>	[kN]	26	41	59	110	172	247	393	
$\gamma_{M,s}$	Partial safety factor		1.9							
NRk,s	Characteristic tensile resistance stainless steel <b>Grade A4-80</b>	[kN]	29	46	67	126	196	282	449	
$\gamma_{M,s}$	Partial safety factor		1.6							
NRk,s	Characteristic tensile resistance stainless steel <b>1.4529</b>	[kN]	26	41	59	110	172	247	393	
$\gamma_{M,s}$	Partial safety factor		1.5							

Supplied By

**FFT**  
Fasteners, Fixings & Tools

01234 333949  
 FAX- 01234 211069  
 info@fasteners-ft.co.uk  
 www.fastenersfixingsandtools.co.uk

Essential Characteristics			Performance							
			M08	M10	M12	M16	M20	M24	M30	
Combined pull-out and concrete cone failure in non-cracked concrete										
	Characteristic bond resistance in non-cracked concrete C20/25									
$\tau_{Rk,ucr}$	Dry and wet concrete	[N/mm <sup>2</sup> ]	11	10	9.5	9.0	8.5	8.0	5.5	
$\gamma_{M,p}$	Partial safety factor	[-]	1.8						2.1	
$\tau_{Rk,ucr}$	Flooded concrete	[N/mm <sup>2</sup> ]	9.0	8.0	7.5	7.0	7.0	6.0		
$\gamma_{M,p}$	Partial safety factor	[-]	2.1							
$\Psi_{cC50/60}$	Factor for concrete C50/60	[-]	1.0							
Combined pull-out and concrete cone failure in cracked concrete										
	Characteristic bond resistance in cracked concrete C20/25									
$\tau_{Rk,cr}$	Dry and wet concrete	[N/mm <sup>2</sup> ]		5.0	5.0	5.0	4.5	4.5		
$\gamma_{M,p}$	Partial safety factor	[-]		1.8						
$\tau_{Rk,cr}$	Flooded concrete	[N/mm <sup>2</sup> ]		5.0	5.0	5.0	4.5	4.5		
$\gamma_{M,p}$	Partial safety factor	[-]		2.1						
	Factor for Cracked concrete									
$\Psi_{cC30/37}$	Increasing factor for concrete C30/37	[-]				1.12				
$\Psi_{cC40/50}$	Increasing factor for concrete C40/50	[-]				1.23				
$\Psi_{cC50/60}$	Increasing factor for concrete C50/60	[-]				1.30				
Splitting failure										
$S_{cr,sp}$	Critical spacing (Splitting)	[mm]				3.0h <sub>ef</sub>				
$C_{cr,sp}$	Critical edge distance (Splitting)	[mm]				1.5h <sub>ef</sub>				
$\gamma_{M,p}$	Partial safety factor	[-]				1.8				
Shear steel failure without bending arm										
$V_{Rk,s}$	Characteristic shear steel failure <b>Grade 5.8</b>	[kN]	9	15	21	39	61	88	140	
$V_{Rk,s}$	Characteristic shear steel failure <b>Grade 8.8</b>	[kN]	15	23	34	63	98	141	224	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.25							
$V_{Rk,s}$	Characteristic shear stainless steel failure <b>Grade A4-70</b>	[kN]	13	20	30	55	86	124	196	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.56							
$V_{Rk,s}$	Characteristic shear stainless steel failure <b>Grade A4-80</b>	[kN]	15	23	34	63	98	141	224	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.33							
$V_{Rk,s}$	Characteristic shear stainless steel failure <b>1.4529</b>	[kN]	13	20	30	55	86	124	196	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.25							
Shear steel failure with bending arm										
$M^0_{Rk,s}$	Characteristic bending moment <b>Grade 5.8</b>	[Nm]	19	37	66	166	325	561	1125	
$M^0_{Rk,s}$	Characteristic bending moment <b>Grade 8.8</b>	[Nm]	30	60	105	266	519	898	1799	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.25							
$M^0_{Rk,s}$	Characteristic bending moment <b>Grade A4-70</b>	[Nm]	26	52	92	233	454	786	1574	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.56							
$M^0_{Rk,s}$	Characteristic bending moment <b>Grade A4-80</b>	[Nm]	30	60	105	266	519	898	1799	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.33							
$M^0_{Rk,s}$	Characteristic bending moment <b>1.4529</b>	[Nm]	26	52	92	233	454	786	1574	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.25							
Concrete pryout failure										
k	Factor in EAD 330499-00-0601, Para. 2.2.8, Table 2.6	[-]	2.0							
$\gamma_{M,c}$	Partial safety factor	[-]	1.5							
Shear concrete edge failure										
$l_{ef}$	Effective anchorage length	[mm]	Effective Embedment Depth (h <sub>ef</sub> )							
$\gamma_{M,c}$	Partial safety factor	[-]	1.5							

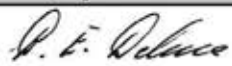
Essential Characteristics			Performance						
			M08	M10	M12	M16	M20	M24	M30
Displacement under Tensile and Shear loading									
Non_cracked concrete									
F	Tensile load	[kN]	6.3	7.9	11.9	15.9	23.8	29.8	45.6
$\delta N0$	Short term displacement under tensile loads	[mm]	0.3	0.3	0.3	0.3	0.4	0.5	0.5
$\delta N\infty$	Long term displacement under tensile loads	[mm]	0.5	0.5	0.5	0.5	0.5	0.5	0.5
F	Shear Load	[kN]	3.1	5.0	7.2	13.5	21.0	30.3	48.0
$\delta V0$	Short term displacement under Shear loads	[mm]	1.5	1.5	1.5	1.5	2.0	2.5	2.5
$\delta V\infty$	Long term displacement under Sheare loads	[mm]	2.3	2.3	2.3	2.3	3.0	3.8	3.8
Cracked concrete									
F	Tensile load in concrete	[kN]	/	5.1	7.4	13.1	20.5	24.6	/
$\delta N0$	Short term displacement under shear load	[mm]	/	0.4	0.7	0.7	0.7	0.6	/

Amendments	Date
Change of ETA Number Cracked concrete added Change of issuing body M8, M20, M24 and M30 included Flooded holes included	04/01/2016
ETAG changed to EAD	19/12/2017
Platting added HCR added Reaction to fire added Minimum Spacing and Edge ammended	06/09/2018

The performances of the product identified by the above product codes are in conformity with the declared performance

This Declaration of performance is issued under the sole responsibility of JCP Construction Products

Signed for and on behalf of the manufacturers

Name and function	Place and date of issue	Signature
Brian Deluce	Teddington	
Technical Manager	06/09/2018	





JFV380SF  
Vol. 410ml

JFV300SF  
Vol. 300ml

## INFORMATION

Vinylester Resin is a two part gray resin (10:1) suitable for use in the vast majority of base materials. It can be used for installing threaded studs, rebar or internal threaded sockets for structural applications such as:

- Columns
- Guard rails
- Façades
- Staircases
- Silo installation
- Machines
- Cantilever beams

## BASE MATERIAL

- Concrete C20/25 To C50/60
- Cracked/Non-Cracked Concrete
- Dry/Wet/Flooded Holes
- Solid Brickwork
- Concrete Block
- Natural Stone

## FEATURES

- Expansion Free
- High Performance
- Close Spacing And Edge Distance
- Can be used in Contact with Potable (Drinking) Water

## APPROVALS

European Technical Approval  
Option 1 Cracked Concrete



ETA15/0704

Water Regulations Advisory Scheme



WRAS Listing Number 1604527

## RELATED PRODUCTS



Injection Resin Gun



Hole Cleaning Brushes and Pump



Mixer Nozzle

Injection Accessories

## WORKING/LOADING TIME

Note:

$T_{work}$  = The highest temperature in the range

$T_{load}$  = The lowest temperature in the range

Temperature °C	Usable Time $T_{work}$ (mins)	Load Time $T_{load}$ (mins)
+5°C to +10°C	10	145
+10°C to +15°C	8	85
+15°C to +20°C	6	75
+20°C to +25°C	5	50
+25°C to +30°C	4	40

Ensure Cartridge Temperature is > 5°C

## EMBEDDED THREADED ROD



- High Tensile Grade 8.8 Chisel End Studs
- Zinc plated & yellow passivated min. 5µm
- Setting Tool Included
- Stainless Steel Grade A4/316
- Chisel End Studs
- Setting Tool Included
- Stainless Steel Grade A4/316
- Chisel End Studs
- Plain Ended
- Zinc Plated and Clear Passivated (Min 5µm)
- Chisel End Studs
- Plain Ended
- Zinc Plated and Clear Passivated (Min 5µm)
- Chisel End Studs
- Setting Tool Included

Supplied By



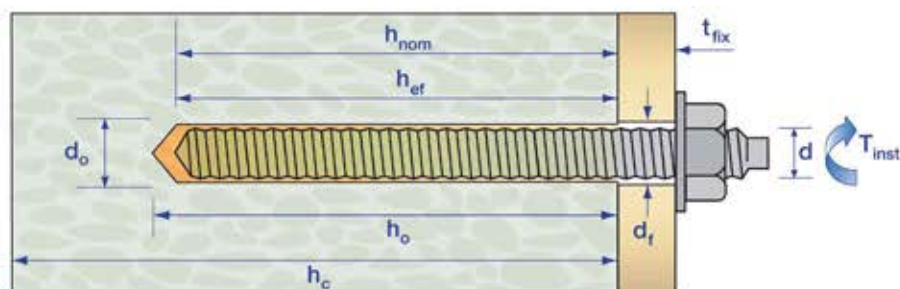


## RANGE AND LOAD DATA

RANGE DATA											
Part Number	Thread Diam (d) mm	Stud Length (L) mm	Drill Hole Diam. (d <sub>o</sub> ) mm	Fixture Clearance Hole (d <sub>i</sub> ) mm	Standard Embedment		Shallow Embedment		Deep Embedment		Tightening Torque (T <sub>inst</sub> ) Nm
					Max. Fix. Thickness (t <sub>fix</sub> ) mm	Min. Hole Depth (h <sub>o</sub> ) mm**	Max. Fix. Thickness (t <sub>fix</sub> ) mm	Min. Hole Depth (h <sub>o</sub> ) mm	Max. Fix. Thickness (t <sub>fix</sub> ) mm	Min. Hole Depth (h <sub>o</sub> ) mm	
High Tensile Grade 8.8 Zinc Plated Yellow Passivated Chisel End Studs											
JSTUD08110HT	M8	110	10	10	18	80	38	64	*	130	10
JSTUD10130HT	M10	130	12	12	25	90	40	80	*	180	20
JSTUD12160HT	M12	160	14	14	34	110	51	96	*	225	40
JSTUD16190HT	M16	190	18	18	42	128	44	128	*	320	80
JSTUD20260HT	M20	260	22	22	55	170	79	160	*	400	150
JSTUD24300HT	M24	300	26	26	55	210	82	192	*	480	200
JSTUD30380HT	M30	380	35	32	55	280	110	240	*	600	275
Stainless Steel Grade A4/316 Chisel End Studs											
JSTUD08110SSA4	M8	110	10	10	18	80	38	64	12	90	10
JSTUD10130SSA4	M10	130	12	12	25	90	40	80	*	125	20
JSTUD12160SSA4	M12	160	14	14	34	110	51	96	*	160	40
JSTUD16190SSA4	M16	190	18	18	42	128	44	128	*	235	80
JSTUD20260SSA4	M20	260	22	22	55	170	79	160	*	310	150
JSTUD24300SSA4	M24	300	26	26	55	210	82	192	*	390	200
Stainless Steel Grade A4/316 Plain Ended and Chisel End Studs											
JSTUD08150PESS	M8	150	10	10	62	80	78	64	52	90	10
JSTUD10105PESS	M10	105	12	12	5	90	15	80	*	125	20
JSTUD10150PESS		150			50		60		15		
JSTUD10200PESS		200			100		110		65		
JSTUD12110PESS	M12	110	14	14	*	110	1	96	*	160	40
JSTUD12150PESS		150			27		41		27		
JSTUD12200PESS		200			77		91		27		
JSTUD16110PESS	M16	110	18	18	*	128	*	128	*	235	80
JSTUD16250PESS		250			104		104		*		
JSTUD16350PESS		350			204		204		97		
JSTUD20200PESS	M20	200	22	22	9	170	19	160	*	310	150
JSTUD20400PESS		400			209		219		69		

\* Deep Embedment Depth can be achieved by using suitable threaded rod cut to length:  $L = h_o + (t_{fix} + t_{Nut+Washer})$

\*\* For the Vinylester Resin:  $h_o = h_{ef}$

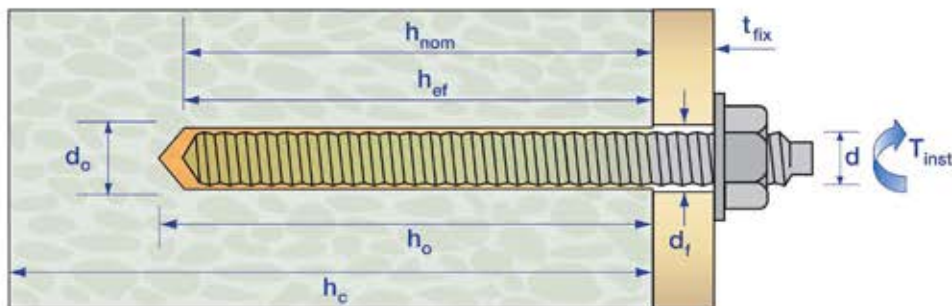




RANGE DATA											
Part Number	Thread Diam (d) mm	Stud Length (L) mm	Drill Hole Diam. (d <sub>o</sub> ) mm	Fixture Clearance Hole (d <sub>i</sub> ) mm	Standard Embedment		Shallow Embedment		Deep Embedment		Tightening Torque (T <sub>inst</sub> ) Nm
					Max. Fix. Thickness (t <sub>fix</sub> ) mm	Min. Hole Depth (h <sub>o</sub> ) mm**	Max. Fix. Thickness (t <sub>fix</sub> ) mm	Min. Hole Depth (h <sub>o</sub> ) mm	Max. Fix. Thickness (t <sub>fix</sub> ) mm	Min. Hole Depth (h <sub>o</sub> ) mm	
Zinc Plated Steel Grade 5.8 - Clear Passivated Plain Ended and Chisel End Studs											
JSTUD08150PE	M8	150	10	10	62	80	78	64	62	80	10
JSTUD10105PE	M10	105	12	12	5	90	15	80	*	115	20
JSTUD10150PE		150			50		60		25		
JSTUD10200PE		200			100		110		75		
JSTUD12110PE	M12	110	14	14	*	110	1	96	*	145	40
JSTUD12150PE		150			27		41		42		
JSTUD12200PE		200			77		91		42		
JSTUD16110PE	M16	110	18	18	*	128	*	128	*	210	80
JSTUD16250PE		250			104		104		22		
JSTUD16350PE		350			204		204		122		
JSTUD20200PE	M20	200	22	22	9	170	19	160	*	280	150
JSTUD20400PE		400			209		219		99		
Zinc Plated Steel Grade 5.8 - Clear Passivated and Chisel End Studs											
JSTUD08110	M8	110	10	10	18	80	38	64	22	80	10
JSTUD10130	M10	130	12	12	25	90	40	80	5	115	20
JSTUD12160	M12	160	14	14	34	110	51	96	2	145	40
JSTUD16190	M16	190	18	18	42	128	44	128	*	210	80
JSTUD20260	M20	260	22	22	55	170	79	160	*	280	150
JSTUD24300	M24	300	26	26	55	210	82	192	*	355	200
JSTUD30380	M30	380	35	32	55	280	110	240	*	600	275

\* Deep Embedment Depth can be achieved by using suitable threaded rod cut to length:  $L = h_o + (t_{fix} + t_{Nut+Washer})$

\*\* For the Vinylester Resin:  $h_o = h_d$







## GRADE 8.8 ZINC PLATED STUDS - NON-CRACKED CONCRETE

### SHALLOW EMBEDMENT

Grade 8.8 Zinc Plated Studs Performance Data (C20/25 non-cracked concrete)

Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile	Shear	Tensile	Shear
8	64	100	17.6	15.0	9.8	12.0	7.0	8.6	200	40	100	130
10	80	110	25.1	23.0	14.0	18.4	10.0	13.1	240	40	120	180
12	96	130	34.4	34.0	19.1	27.2	13.6	19.4	270	50	140	250
16	128	170	57.9	63.0	32.2	50.4	23.0	36.0	350	70	180	390
20	160	205	85.5	98.0	47.5	78.4	33.9	56.0	430	140	220	550
24	192	245	115.8	141.0	64.3	112.8	46.0	80.6	500	210	250	720
30	240	310	124.4	248.8	59.2	165.9	42.3	118.5	520	520	260	920

### STANDARD EMBEDMENT

Grade 8.8 Zinc Plated Studs Performance Data (C20/25 non-cracked concrete)

Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile	Shear	Tensile	Shear
8	80	110	22.1	15.0	12.3	12.0	8.8	8.6	200	40	100	120
10	90	120	28.3	23.0	15.7	18.4	11.2	13.1	240	50	120	170
12	110	140	39.4	34.0	21.9	27.2	15.6	19.4	270	60	140	230
16	128	170	57.9	63.0	32.2	50.4	23.0	36.0	350	70	180	390
20	170	215	90.8	98.0	50.4	78.4	36.0	56.0	430	100	220	530
24	210	270	126.7	141.0	70.4	112.8	50.3	80.6	500	140	250	670
30	280	350	145.1	224.0	69.1	179.2	49.4	128.0	520	420	260	920

### DEEP EMBEDMENT

Grade 8.8 Zinc Plated Studs Performance Data (C20/25 non-cracked concrete)

Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile	Shear	Tensile	Shear
8	130	160	29.0	15.0	19.3	12.0	13.8	8.6	180	70	100	100
10	180	210	46.0	23.0	30.7	18.4	21.9	13.1	220	90	120	120
12	225	255	67.0	34.0	44.7	27.2	31.9	19.4	270	120	140	150
16	320	355	144.8	63.0	80.4	50.4	57.4	36.0	350	160	180	220
20	400	445	213.6	98.0	118.7	78.4	84.8	56.0	430	200	220	290
24	480	540	289.5	141.0	160.8	112.8	114.9	80.6	500	240	260	360
30	600	670	311.0	224.0	148.1	179.2	105.8	128.0	520	300	300	510







## GRADE 8.8 ZINC PLATED STUDS - CRACKED CONCRETE

### SHALLOW EMBEDMENT

Grade 8.8 Zinc Plated Studs Performance Data (C20/25 cracked concrete)												
Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>sd</sub> )	Shear (V <sub>sd</sub> )	Tensile (N <sub>sp</sub> )	Shear (V <sub>sp</sub> )	Tensile	Shear	Tensile	Shear
8	Not included in the ETA											
10	80	110	12.6	25.1	7.0	16.8	5.0	12.0	230	240	120	240
12	96	130	18.1	36.2	10.1	24.1	7.2	17.2	270	280	140	320
16	128	170	32.2	64.3	17.9	42.9	12.8	30.6	360	360	180	490
20	160	205	45.2	90.5	25.1	60.3	18.0	43.1	430	430	220	610
24	192	245	65.1	130.3	36.2	86.9	25.9	62.0	500	500	250	790
30	Not included in the ETA											

### STANDARD EMBEDMENT

Grade 8.8 Zinc Plated Studs Performance Data (C20/25 cracked concrete)												
Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>sd</sub> )	Shear (V <sub>sd</sub> )	Tensile (N <sub>sp</sub> )	Shear (V <sub>sp</sub> )	Tensile	Shear	Tensile	Shear
8	Not included in the ETA											
10	90	120	14.1	23.0	7.9	18.4	5.6	13.1	230	220	120	250
12	110	140	20.7	34.0	11.5	27.2	8.2	19.4	270	260	140	340
16	128	170	32.2	64.3	17.9	42.9	12.8	30.6	360	360	180	490
20	170	215	48.1	96.1	26.7	64.1	19.1	45.8	430	430	220	630
24	210	270	71.3	142.5	39.6	95.0	28.3	67.9	500	500	250	820
30	Not included in the ETA											

### DEEP EMBEDMENT

Grade 8.8 Zinc Plated Studs Performance Data (C20/25 cracked concrete)												
Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>sd</sub> )	Shear (V <sub>sd</sub> )	Tensile (N <sub>sp</sub> )	Shear (V <sub>sp</sub> )	Tensile	Shear	Tensile	Shear
8	Not included in the ETA											
10	180	210	28.3	23.0	15.7	18.4	11.2	13.1	230	90	120	160
12	225	255	42.4	34.0	23.6	27.2	16.8	19.4	270	120	140	210
16	320	355	80.4	63.0	44.7	50.4	31.9	36.0	360	160	180	320
20	400	445	113.1	98.0	62.8	78.4	44.9	56.0	430	200	220	440
24	480	540	162.9	141.0	90.5	112.8	64.6	80.6	500	240	250	570
30	Not included in the ETA											







## GRADE A4-70 STAINLESS STEEL STUDS - NON-CRACKED CONCRETE

### SHALLOW EMBEDMENT

Grade A4-70 Stainless Steel Studs Performance Data (C20/25 non-cracked concrete)

Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile	Shear	Tensile	Shear
8	64	100	17.7	13.0	9.8	8.3	7.0	6.0	200	40	100	90
10	80	110	25.1	20.0	14.0	12.8	10.0	9.2	240	40	120	120
12	96	130	34.4	30.0	19.1	19.2	13.6	13.7	270	50	140	170
16	128	170	57.9	55.0	32.2	35.3	23.0	25.2	350	70	180	260
20	160	205	85.5	86.0	47.5	55.1	33.9	39.4	430	80	220	370
24	192	245	115.8	124.0	64.3	79.5	46.0	56.8	500	100	250	480
30	240	310	124.4	196.0	59.2	125.6	42.3	89.7	520	220	260	670

### STANDARD EMBEDMENT

Grade A4-70 Stainless Steel Studs Performance Data (C20/25 non-cracked concrete)

Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile	Shear	Tensile	Shear
8	80	110	22.1	13.0	12.3	8.3	8.8	6.0	200	40	100	80
10	90	120	28.3	20.0	15.7	12.8	11.2	9.2	240	50	120	120
12	110	140	39.4	30.0	21.9	19.2	15.6	13.7	270	60	140	160
16	128	170	57.9	55.0	32.2	35.3	23.0	25.2	350	70	180	260
20	170	215	90.8	86.0	50.4	55.1	36.0	39.4	430	90	220	350
24	210	270	126.7	124.0	70.4	79.5	50.3	56.8	500	110	250	450
30	280	350	145.1	196.0	69.1	125.6	49.4	89.7	520	140	260	600

### DEEP EMBEDMENT

Grade A4-70 Stainless Steel Studs Performance Data (C20/25 non-cracked concrete)

Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile	Shear	Tensile	Shear
8	90	120	26.0	13.0	13.7	8.3	9.8	6.0	190	50	100	80
10	125	155	41.0	20.0	21.6	12.8	15.4	9.2	230	70	120	100
12	160	190	59.0	30.0	31.1	19.2	22.2	13.7	260	80	140	120
16	235	270	110.0	55.0	57.9	35.3	41.4	25.2	340	120	180	180
20	310	355	172.0	86.0	90.5	55.1	64.7	39.4	410	160	210	230
24	390	450	247.0	124.0	130.0	79.5	92.9	56.8	490	200	260	290
30	600	670	311.0	196.0	148.1	125.6	105.8	89.7	520	300	300	370







## GRADE A4-70 STAINLESS STEEL STUDS - CRACKED CONCRETE

### SHALLOW EMBEDMENT

Grade A4-70 Stainless Steel Studs Performance Data (C20/25 cracked concrete)													
Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm		
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>sd</sub> )	Shear (V <sub>sd</sub> )	Tensile (N <sub>sp</sub> )	Shear (V <sub>sp</sub> )	Tensile	Shear	Tensile	Shear	
8	Not included in the ETA												
10	80	110	12.6	20.0	7.0	12.8	5.0	9.2	240	90	120	180	
12	96	130	18.1	30.0	8.6	19.2	6.2	13.7	270	130	140	250	
16	128	170	32.2	55.0	17.9	35.3	12.8	25.2	360	200	180	390	
20	160	205	45.2	86.0	25.1	55.1	18.0	39.4	430	340	220	550	
24	192	245	65.1	124.0	36.2	79.5	25.9	56.8	500	400	250	720	
30	Not included in the ETA												

### STANDARD EMBEDMENT

Grade A4-70 Stainless Steel Studs Performance Data (C20/25 cracked concrete)													
Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm		
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>sd</sub> )	Shear (V <sub>sd</sub> )	Tensile (N <sub>sp</sub> )	Shear (V <sub>sp</sub> )	Tensile	Shear	Tensile	Shear	
8	Not included in the ETA												
10	90	120	14.1	20.0	7.9	12.8	5.6	9.2	240	50	120	170	
12	110	140	20.7	30.0	9.9	19.2	7.1	13.7	270	60	140	230	
16	128	170	32.2	55.0	17.9	35.3	12.8	25.2	360	200	180	390	
20	170	215	48.1	86.0	26.7	55.1	19.1	39.4	430	280	220	530	
24	210	270	71.3	124.0	39.6	79.5	28.3	56.8	500	300	250	670	
30	Not included in the ETA												

### DEEP EMBEDMENT

Grade A4-70 Stainless Steel Studs Performance Data (C20/25 cracked concrete)													
Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm		
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>sd</sub> )	Shear (V <sub>sd</sub> )	Tensile (N <sub>sp</sub> )	Shear (V <sub>sp</sub> )	Tensile	Shear	Tensile	Shear	
8	Not included in the ETA												
10	175	205	27.5	20.0	15.3	12.8	10.9	9.2	240	90	120	120	
12	240	270	45.2	30.0	21.5	19.2	15.4	13.7	270	120	140	150	
16	320	355	80.4	55.0	44.7	35.3	31.9	25.2	360	160	180	220	
20	400	445	113.1	86.0	62.8	55.1	44.9	39.4	430	200	220	290	
24	480	540	162.9	124.0	90.5	79.5	64.6	56.8	500	240	250	360	
30	Not included in the ETA												







## GRADE 5.8 ZINC PLATED STUDS - NON-CRACKED CONCRETE

### SHALLOW EMBEDMENT

Grade 5.8 Zinc Plated Studs Performance Data (C20/25 non-cracked concrete)

Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile	Shear	Tensile	Shear
8	64	100	17.7	9.0	9.8	7.2	7.0	5.1	200	40	100	70
10	80	110	25.1	15.0	14.0	12.0	10.0	8.6	240	40	120	110
12	96	130	34.4	21.0	19.1	16.8	13.6	12.0	270	50	140	140
16	128	170	57.9	39.0	32.2	31.2	23.0	22.3	350	70	180	230
20	160	205	85.5	61.0	47.5	48.8	33.9	34.9	430	80	220	320
24	192	245	115.8	88.0	64.3	70.4	46.0	50.3	500	100	250	420
30	240	310	124.4	140.0	59.2	112.0	42.3	80.0	520	120	260	580

### STANDARD EMBEDMENT

Grade 5.8 Zinc Plated Studs Performance Data (C20/25 non-cracked concrete)

Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile	Shear	Tensile	Shear
8	80	110	18.0	9.0	12.0	7.2	8.6	5.1	190	40	100	70
10	90	120	28.3	15.0	15.7	12.0	11.2	8.6	240	50	120	110
12	110	140	39.4	21.0	21.9	16.8	15.6	12.0	270	60	140	130
16	128	170	57.9	39.0	32.2	31.2	23.0	22.3	350	70	180	230
20	170	215	90.8	61.0	50.4	48.8	36.0	34.9	430	90	220	310
24	210	270	126.7	88.0	70.4	70.4	50.3	50.3	500	110	250	390
30	280	350	145.1	140.0	69.1	112.0	49.4	80.0	520	140	260	520

### DEEP EMBEDMENT

Grade 5.8 Zinc Plated Studs Performance Data (C20/25 non-cracked concrete)

Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile	Shear	Tensile	Shear
8	*	*	*	*	*	*	*	*	*	*	*	*
10	115	145	29.0	15.0	19.3	12.0	13.8	8.6	210	60	120	90
12	145	175	42.0	21.0	28.0	16.8	20.0	12.0	250	80	130	110
16	210	245	79.0	39.0	52.7	31.2	37.6	22.3	350	110	180	170
20	280	325	123.0	61.0	82.0	48.8	58.6	34.9	420	140	210	210
24	355	410	177.0	88.0	118.0	70.4	84.3	50.3	490	180	260	270
30	600	670	311.0	140.0	148.1	112.0	105.8	80.0	520	300	300	330

\* Increased embedment depth limited by steel strength.







## GRADE 5.8 ZINC PLATED STUDS - CRACKED CONCRETE

### SHALLOW EMBEDMENT

Grade 5.8 Zinc Plated Studs Performance Data (C20/25 cracked concrete)												
Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>sd</sub> )	Shear (V <sub>sd</sub> )	Tensile (N <sub>sp</sub> )	Shear (V <sub>sp</sub> )	Tensile	Shear	Tensile	Shear
8	Not included in the ETA											
10	80	110	12.6	15.0	7.0	12.0	5.0	8.6	240	70	120	170
12	96	130	18.1	21.0	10.1	16.8	7.2	12.0	270	70	140	210
16	128	170	32.2	39.0	17.9	31.2	12.8	22.3	350	120	180	340
20	160	205	45.2	61.0	25.1	48.8	18.0	34.9	430	230	220	480
24	192	245	65.1	88.0	36.2	70.4	25.9	50.3	500	280	250	620
30	Not included in the ETA											

### STANDARD EMBEDMENT

Grade 5.8 Zinc Plated Studs Performance Data (C20/25 cracked concrete)												
Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>sd</sub> )	Shear (V <sub>sd</sub> )	Tensile (N <sub>sp</sub> )	Shear (V <sub>sp</sub> )	Tensile	Shear	Tensile	Shear
8	Not included in the ETA											
10	90	120	14.1	15.0	7.9	12.0	5.6	8.6	240	70	120	160
12	110	140	20.7	21.0	11.5	16.8	8.2	12.0	270	70	140	200
16	128	170	32.2	39.0	17.9	31.2	12.8	22.3	350	120	180	340
20	170	215	48.1	61.0	26.7	48.8	19.1	34.9	430	180	220	460
24	210	270	71.3	88.0	39.6	70.4	28.3	50.3	500	190	250	580
30	Not included in the ETA											

### DEEP EMBEDMENT

Grade 5.8 Zinc Plated Studs Performance Data (C20/25 cracked concrete)												
Thread Diam (d) mm	Minimum Hole Depth (h <sub>o</sub> ) mm	Minimum Concrete Thickness (h <sub>min</sub> ) mm	Characteristic Resistance kN		Design Resistance kN		Approved Resistance kN		Design Spacing (S) mm		Design Edge Distance (C) mm	
			Tensile (N <sub>st</sub> )	Shear (V <sub>st</sub> )	Tensile (N <sub>sd</sub> )	Shear (V <sub>sd</sub> )	Tensile (N <sub>sp</sub> )	Shear (V <sub>sp</sub> )	Tensile	Shear	Tensile	Shear
8	Not included in the ETA											
10	200	230	31.4	15.0	17.5	12.0	12.5	8.6	240	100	120	110
12	240	270	45.2	21.0	25.1	16.8	18.0	12.0	270	130	140	140
16	255	290	64.1	39.0	35.6	31.2	25.4	22.3	350	130	180	210
20	320	365	90.5	61.0	50.3	48.8	35.9	34.9	430	160	220	290
24	400	460	135.7	88.0	75.4	70.4	53.9	50.3	500	200	250	360
30	Not included in the ETA											





## SUPPLEMENTARY DATA

INFLUENCE OF CONCRETE STRENGTH					
Concrete strength		C20/25	C30/37	C40/50	C50/60
Cylinder	N/mm <sup>2</sup>	20	30	40	50
Cube	N/mm <sup>2</sup>	25	37	50	60
Factor	Cracked	1.0	1.12	1.23	1.30

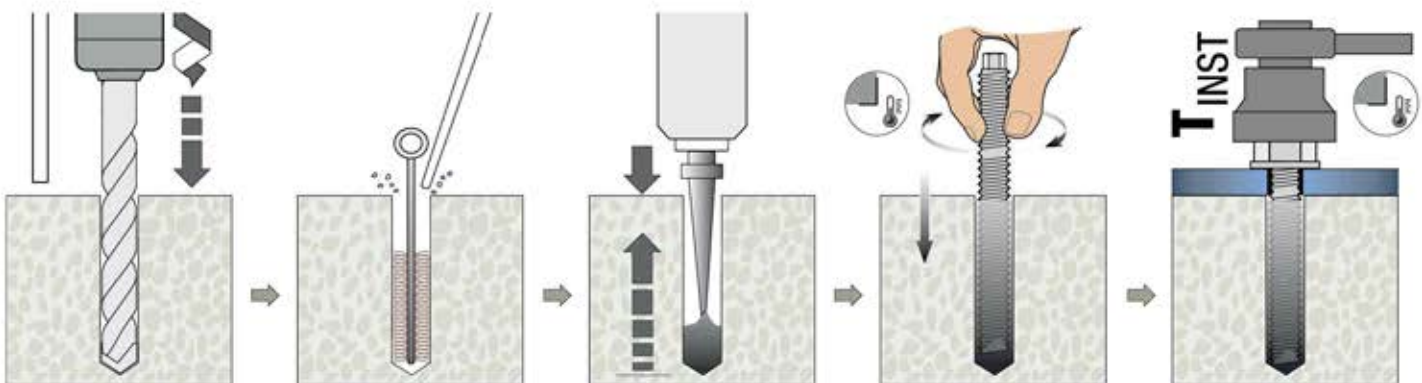
Important Note:

When using concrete factors ensure that loads do not exceed Steel Design Resistance.

STEEL DESIGN RESISTANCE FOR SINGLE ANCHOR								
Load Type	Steel Grade	Threaded Rod Size						
		M8	M10	M12	M16	M20	M24	M30
Tensile (kN)	High Tensile Grade 8.8	19.3	30.7	44.7	84.0	130.7	188.0	299.3
	Stainless Steel Grade A4-70	13.7	21.6	31.1	57.9	90.5	130.0	206.8
	Grade 5.8	12.0	19.3	28.0	52.7	82.0	118.0	187.3
Shear (kN)	High Tensile Grade 8.8	12.0	18.4	27.2	50.4	78.4	112.8	179.2
	Stainless Steel Grade A4-70	8.3	12.8	19.2	35.3	55.1	79.5	125.6
	Grade 5.8	7.2	12.0	16.8	31.2	48.8	70.4	112.0

For variations in structure thickness, reduced spacing and edge calculations download the free **Anchor Calculation Program** from [www.jcpfixings.co.uk](http://www.jcpfixings.co.uk)

## INSTALLATION INSTRUCTIONS



-Drill correct diameter hole to corresponding depth

-Clean hole by brushing, blowing to remove drilling debris and dust:  
2xBlowing  
2xBrushing  
2xBlowing  
2xBrushing  
2xBlowing

-Attach nozzle to cartridge  
-Extrude first part to waste until an even colour is achieved  
-Fill hole 1/3 to 1/2 full starting from the bottom of the hole

-Insert stud into base material by hand using a twisting motion

-Allow resin to cure  
-Attach fixture  
-Tighten with torque wrench to recommended torque

