DRIZORO® Construction Products

MAXFIX® -V

CE

FAST CURING, VINYL ESTER-BASED ANCHORING RESIN FOR METAL ELEMENTS, THREADED RODS AND REBARS INTO CONCRETE AND SOLID OR HOLLOW MASONRY

DESCRIPTION

MAXFIX® -V is a solvent-free, vinyl ester-based resin which is packed in two-part biaxial type cartridge. It is specially designed for use by injection means. It is suitable for any solid or hollow base materials. Applications can be made easy and quick way by a chemical anchor caulking gun.

APPLICATIONS

- Anchoring of anchor plates, angles and profiles to concrete and masonry.
- Fastening of reinforcing bars (rebars) to concrete.
- Anchoring of ventilating façade elements to surfaces.
- Anchoring of fences and pre-fences.
- Anchoring of banisters and rails, installations, lift rails, bathroom fittings, etc.
- Anchoring of awnings, lights, street furniture, street lighting, etc.

ADVANTAGES

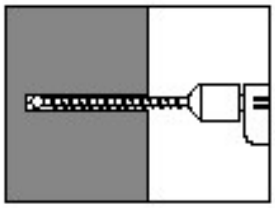
- Packed resin into injection cartridge for use directly with chemical anchor caulking gun.
- Easy and handy application, it does not require a premixing.
- Quick job-place for anchored objects.
- Its good thixotropy allows the application on wall and ceiling.
- It is suitable for fastening on common materials used in construction: concrete, stone, masonry, hollow brick, solid brick, wood, etc.
- It does not produce any expansion strain into base material.
- It allows short distances from edges and anchor spacing.
- Good adhesion, even on wet supports.
- A cartridge can be used for many times.

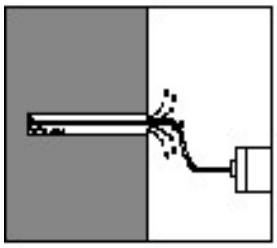
APPLICATION INSTRUCTIONS

Surface preparation

Make sure that base material is sound and also is not deteriorated.

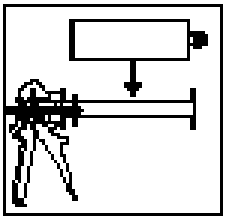
Drill a hole into base material with a suitable drill bit according to the characteristics of the anchored object, the hole should have the suitable diameter and depth (see Tables 1 and 2).



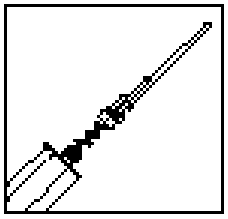


For removing the dust, clean the hole by brushes and blowing-out devices. Make sure that threaded rods or rebars are free of any contaminants, oils, greases, dust, etc.

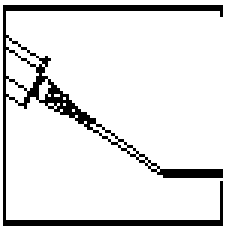
Procedure for the injection system



Pressing the release lever and then, pull back the piston of the hand chemical anchor caulking gun. Unscrew the protection top and insert the cartridge into the chemical anchor caulking gun.



Before screwing the mixing nozzle, make sure that both component A and component B are coming out accurately from the cartridge. Finally, screw the mixing nozzle.



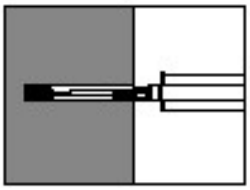
To get a suitable mixing, squeeze out resin until the product becomes uniform in colour. A couple of trigger pulls could be necessary (5 cm). Once all these steps have been done, system is ready for use. Proceed in the same way for each change in the mixing nozzle.

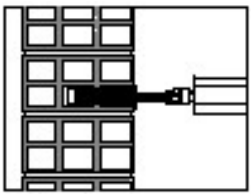
Table 1. Anchor data in solid material			
Threaded rods	**M10**	**M12**	**M16**
Hole diameter (mm)	12	14	18
Standard hole depth (mm)	100	120	130
Minimum thickness for base material (mm)	130	150	165
Rebars	**ϕ 10**	**ϕ 12**	**ϕ 16**
Hole diameter (mm)	12	16	20
Standard hole depth (mm)	180	220	280
Minimum thickness for base material (mm)	210	250	320

Table 2. Anchor data in hollow materials			
Threaded rods	**M8**	**M10**	**M12**
Hole diameter (mm)	16	16	16
Standard hole depth (mm)	90	90	90
Min. thickness for base material (mm)	120	120	120

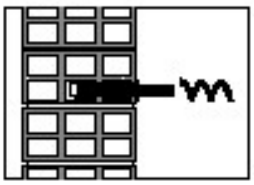
Application

Inject ***MAXFIX® -V*** into the hole for solid materials, or into the plastic sleeve previously placed for hollow materials. Make sure; insert the mixing nozzle at the end of the hole. As hole is full of resin the chemical anchor caulking gun should be removed.



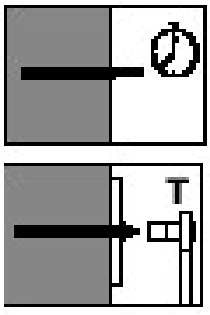


In order to get a good impregnation of the anchors, threaded rods or rebars with vinyl ester-based resin into the hole, a light twisting motion should be done while those are placed. Make sure that metal objects are free of grease, rust and dust. Before loading the threaded rods/rebar, wait the curing time.



Application Conditions
During application, both the ***MAXFIX®* -V** cartridge and the base material should be in the temperature range from +5°C to +30°C.

Curing
The curing time depends on application temperature. In this way, high temperatures speed up the reaction while low temperatures slow down the process. Before applying the torque tight on the fastening, the curing time must be observed. The pot life matches with the initial curing time in which the resin has not still begun to harden, allowing rectifications (working time in which anchors or rods can be inserted and adjusted). To harden completely, resin employs the curing time.



Substrate temperature (ºC)	Pot life (min)	Curing time (h)
5	30	8
10	20	5
20	7	2
30	4	1,5
35	2	1

Cleaning
Before pot life finishes, all tools and equipment should be cleaned with a duster. Once ***MAXFIX®* -V** hardens, it can only be removed by mechanical means.

CONSUMPTION

Depending on the metrics and depth, many anchors can be done with a ***MAXFIX®* -V** cartridge of 410 ml.

Hollow base material
17-22 anchors per 410 ml cartridge

Solid base material
Number of anchors = 410 / V

$$V = 0{,}6 * d^2 * h$$

$$d : \text{Drill diameter (cm)}$$

$$h : \text{Drill thickness(cm)}$$

IMPORTANT INDICATIONS

- If resin cures into the mixing nozzle, a new one must be used for more applications.
- Technical data are from numerous laboratory tests on common materials. If in doubt about base material, some previous tests should be done. These tests will indicate the suitability for the system.
- Fastenings can be done on damp surfaces, but running water is not allowed.
- Follow the instructions given herein for correct applications. If in doubt or any other further information, consult the Technical Department.

PACKAGING

Two-part biaxial type cartridge of 410 ml.

STORAGE

Twelve months in its original unopened packaging. It should be stored in a dry, fresh and covered place, protected from direct sun light. Temperature range for storage should be from 5°C to 30°C.

SAFETY AND HEALTH

Vinyl-ester resin can irritate to skin, so that protective rubber gloves and goggles must be used to handle and apply the resin. In case of skin contact, wash affected areas with soap and water, but do not rub. If irritation continues, seek medical attention. In case of eye contact, rinse thoroughly with clean water for at least 15 min, but do not rub and seek medical attention. In case of inhalation, supply fresh air.

For further information, Safety Data Sheet of ***MAXFIX®* -V** is available.

Disposal of the product and its empty containers must be made according to official regulations. This disposal must be made by the final user.

TECHNICAL DATA

Table 3. DESIGN METHOD A

Characteristics values for tensile loads				Characteristics values for shear loads			
Anchor size	**M10**	**M12**	**M16**	**Anchor size**	**M10**	**M12**	**M16**
Steel failure				**Steel failure without lever arm**			
Characteristic resistance **Steel 5.8** $N_{Rk,s}$ (kN)	29	42	78	Characteristic resistance **Steel 5.8** $V_{Rk,s}$ (kN)	15	21	39
Characteristic resistance **Steel 8.8** $N_{Rk,s}$ (kN)	46	67	126	Characteristic resistance **Steel 8.8** $V_{Rk,s}$ (kN)	23	33	63
Respective partial safety factor γ_{Ms}(1)	1,5			Respective partial safety factor γ_{Ms}(1)	1,25		
Characteristic resistance **Steel A4-70** $N_{Rk,s}$ (kN)	41	59	110	Characteristic resistance **Steel A4-70** $V_{Rk,s}$ (kN)	20	29	55
Respective partial safety factor γ_{Ms}(1)	1,87			Respective partial safety factor γ_{Ms}(1)	1,56		
Characteristic resistance **Steel A4-80** $N_{Rk,s}$ (kN)	46	67	126	Characteristic resistance **Steel A4-80** $V_{Rk,s}$ (kN)	23	34	63
Respective partial safety factor γ_{Ms}(1)	1,6			Respective partial safety factor γ_{Ms}(1)	1,33		
Pullout failure and concrete cone failure				**Steel failure with lever arm**			
Characteristic resistance in non-cracked C20/25 $N^0_{Rk,c}$ (kN)	30	40	60	Characteristic resistance **Steel 5.8** $M^0_{Rk,s}$ (Nm)	37	65	166
Increasing factor for non-cracked concrete C50/60 ψ_c	1,15	1,07	1,04	Characteristic resistance **Steel 8.8** $M^0_{Rk,s}$ (Nm)	60	105	266
Effective anchorage depth h_{ef} (mm)	90	110	125	Respective partial safety factor γ_{Ms}(1)	1,25		
Spacing $S_{cr,N}$ (mm)	180	220	250	Characteristic resistance **Steel A4-70** $M^0_{Rk,s}$ (Nm)	52	92	233
Edge distance $C_{cr,N}$ (mm)	90	110	125	Respective partial safety factor γ_{Ms}(1)	1,56		
Respective partial safety factor $\gamma_{MP} = \gamma_{Ms}$(1)	1,5(2)	1,5(2)	1,5(2)	Characteristic resistance **Steel A4-80** $M^0_{Rk,s}$ (Nm)	60	105	266
Splitting failure				Respective partial safety factor γ_{Ms}(1)	1,33		
Spacing $S_{cr,sp}$ (mm)	4 h_{ef}	4 h_{ef}	3 h_{ef}	**Concrete pryout failure**			
Edge distance $C_{cr,sp}$ (mm)	2 h_{ef}	2 h_{ef}	1,5 h_{ef}	Factor in equation (5.6) of ETAG 001 Annex C section 5.2.3.3. k	2,0		
Respective partial safety factor γ_{Msp}(1)	1,5(2)	1,5(2)	1,5(2)	Respective partial safety factor γ_{Mc}(1)	1,5(2)		
Displacements under tensión loads				**Concrete edge failure**			
Tension loads N (kN)	12	19	28	Effective length of the anchor in shear loading l_f (mm)	90	110	125
Displacements δ_{N0} (mm)	0,8			Outside diameter of the anchor d_{nom} (mm)	12	14	16
Displacements δ_{Noo} (mm)	1,0			Respective partial safety factor γ_{Mc}(1)	1,5(2)		
				Displacements under shear loads			
				Shear load V (kN)	8	12	22
				Displacements δ_{V0} (mm)	1,0		
				Displacements δ_{Voo} (mm)	1,5		

(1) In the absence of other national regulatory
(2) The partial safety factor is included γ2 = 1.0

Admissible loads

For anchor design, the admissible load (F_{adm}) results in multiply the recommended load (F_{rec}) by both reduction factors such as distance between anchor centres (f_a) and edge distance (f_b) and correction factors such as concrete type (f_c) and anchoring depth (f_d).

$$F_{adm} = F_{rec} * f_a * f_b * f_c * f_d$$

Correction factors:

- Anchor spacing fa

$$f_a = \frac{S}{40 * d} + 0{,}5 \leq 1$$

$$f_a = 1 \; if \quad S \geq 20 * d$$

- Edge distance fb

Tensile Loads

$$f_{b,N} = 0{,}75 * \frac{C}{13{,}6 * d} + 0{,}25 \leq 1$$

Shear Loads

$$f_{b,V} = \frac{C}{13{,}6 * d} \leq 1$$

S: Distance between anchor centres (mm).
C: Distance from an edge (mm).

d: Anchor diameter (mm).
h_{st}: Standard depth (mm).
h: Real depth (mm).

Correction factors:

- Type of concrete fc

Above strength data are suitable for anchors on C25/30 concrete. For concrete with different strengths, a correction factor must be applied.

	Type of concrete	HM20	HA25	HA30	HA35	HA40
fc	Shear loads	0,90	1,00	1,12	1,22	1,34
	Tensile loads	0,90	1,00	1,04	1,08	1,12

- Anchoring depth fd

The tensile strength of anchors is directly proportional to anchoring depth. The shear strength does not vary if an anchoring depth, h (mm), longer than standard anchoring depth, h_{st}, is used.

Tensile Loads

$$f_{d,N} = \frac{h}{h_{st}}$$

Shear Loads

$$f_{d,V} = 1$$

GUARANTEE

The information contained in this leaflet is based on our experience and technical knowledge, obtained through laboratory testing and from bibliographic material. ***DRIZORO®, S.A.U.*** reserves the right to introduce changes without prior notice. Any use of this data beyond the purposes expressly specified in the leaflet will not be the Company's responsibility unless authorised by us. We shall not accept responsibility exceeding the value of the purchased product. The data shown on consumptions, measurement and yields are for guidance only and based on our experience. These data are subject to variation due to the specific atmospheric and jobsite conditions so reasonable variations from the data may be experienced. In order to know the real data, a test on the jobsite must be done, and it will be carried out under the client responsibility. We shall not accept responsibility exceeding the value of the purchased product. For any other doubt, consult our Technical Department. This version of bulletin replaces the previous one.

DRIZORO Construction Products

DRIZORO, S.A.U.
C/ Primavera 50-52 Parque Industrial Las Monjas
28850 TORREJON DE ARDOZ – MADRID (SPAIN)
Tel. 91 676 66 76 - 91 677 61 75 Fax. 91 675 78 13
e-mail: info@drizoro.com Web site: drizoro.com