

**ripple** **friulsider**



# FRP

## Vinylester based Chemical Capsule Anchor



- Concrete substrate
- For very high loads
- Styrene free
- Glass capsule
- Internal or externally threaded anchor
- Crushed glass becomes integral part of mix
- ETA – Option 7

**HEAVY DUTY**



- concrete
- solid stone

## Vinylester based Chemical Capsule Anchor

### Product Detailing



- Inner Tube

Hardener :

- Di-benzoyl peroxide
- Poly (methyl Methacrylate)
- Dicyclohexyl phthalate

- Outer Tube

Resin :

- Methacrylic acid monoester with propane 1, 2 idol
- Ethylene dimethacrylate
- Graded Quartz

## Vinylester based Chemical Capsule Anchor

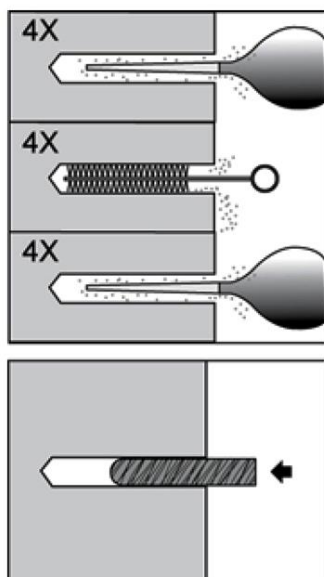


### Installation Procedure

#### Step 1

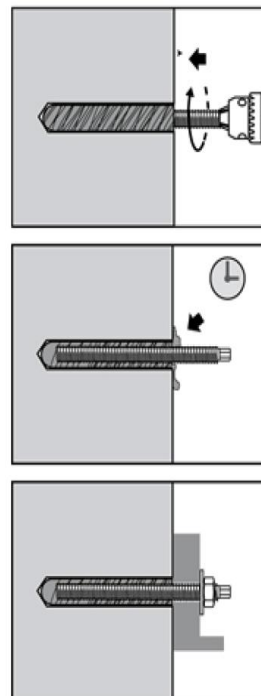
#### Step 2

### INSTALLATION



- 1** Thoroughly clean the hole:  
 a) brush the hole at least 4 times  
 b) blow out the hole at least 4 times  
 c) brush the hole again 4 times.

- 2** Insert the capsule



- 3** Insert bar using rotary hammer.  
 For ceiling installation support bar until held.

- 4** Leave undisturbed for full curing time before applying fixture.

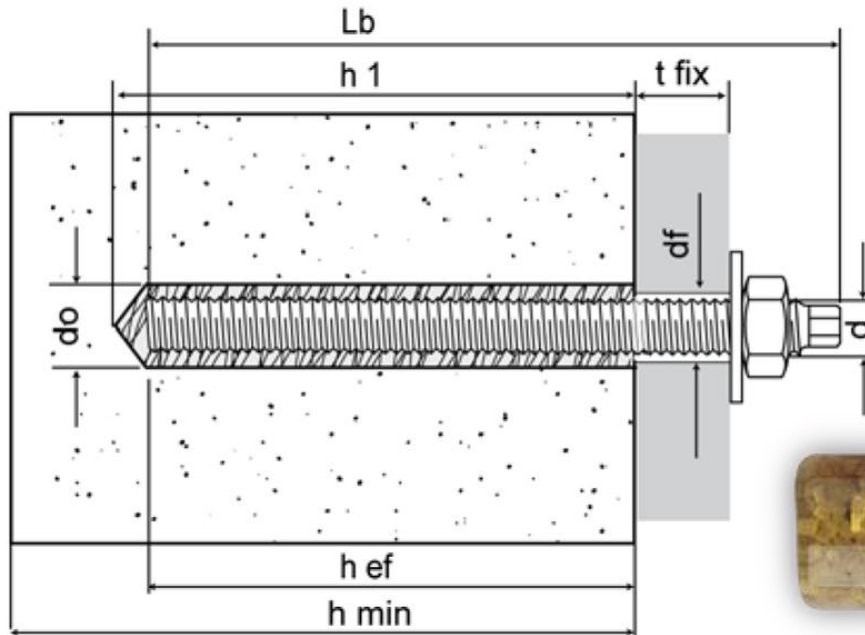
- 5** Apply fixture and tighten nut.

| °C                         | -5°C                                     | 0°C      | +10°C    | +20°C   | +30°C   |
|----------------------------|--|----------|----------|---------|---------|
| <b>Curing times</b>        | 480 min.                                 | 240 min. | 120 min. | 45 min. | 20 min. |
| <b>Working temperature</b> | -40°C/ +50°C (max 80°C for short period) |          |          |         |         |



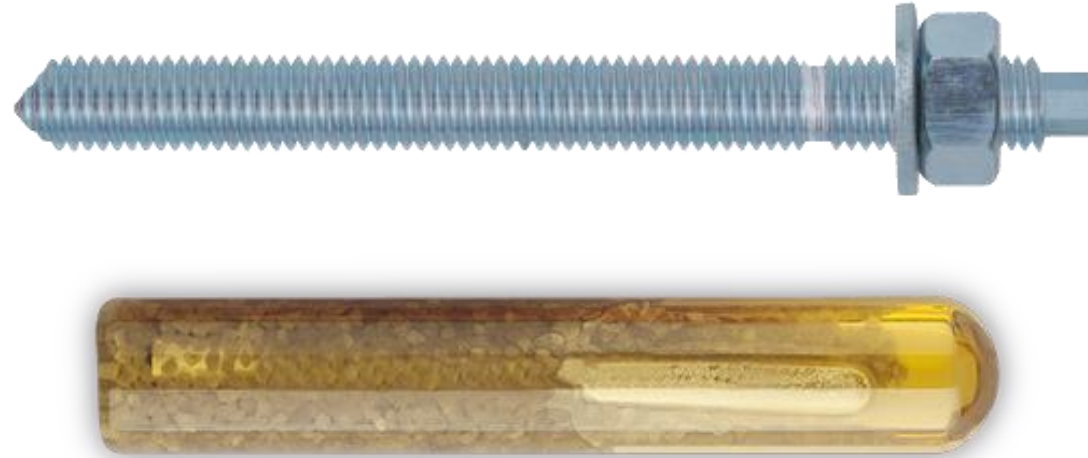
# FRP

## Vinylester based Chemical Capsule Anchor



| <i>FRP capsule</i> |      |                   |                    |                   |                     |             |
|--------------------|------|-------------------|--------------------|-------------------|---------------------|-------------|
| size               | d mm | d <sub>o</sub> mm | h <sub>ef</sub> mm | h <sub>1</sub> mm | h <sub>min</sub> mm | Cod.        |
| FRP8               | M8   | 10                | 80                 | 85                | 120                 | 93200008000 |
| FRP10              | M10  | 12                | 90                 | 95                | 130                 | 93200010000 |
| FRP12              | M12  | 14                | 110                | 115               | 140                 | 93200012000 |
| FRP16              | M16  | 18                | 125                | 130               | 180                 | 93200016000 |
| FRP20              | M20  | 25                | 170                | 175               | 230                 | 93200020000 |
| FRP24              | M24  | 28                | 210                | 215               | 270                 | 93200024000 |
| FRP30              | M30  | 35                | 270                | 275               | 340                 | 93200030000 |

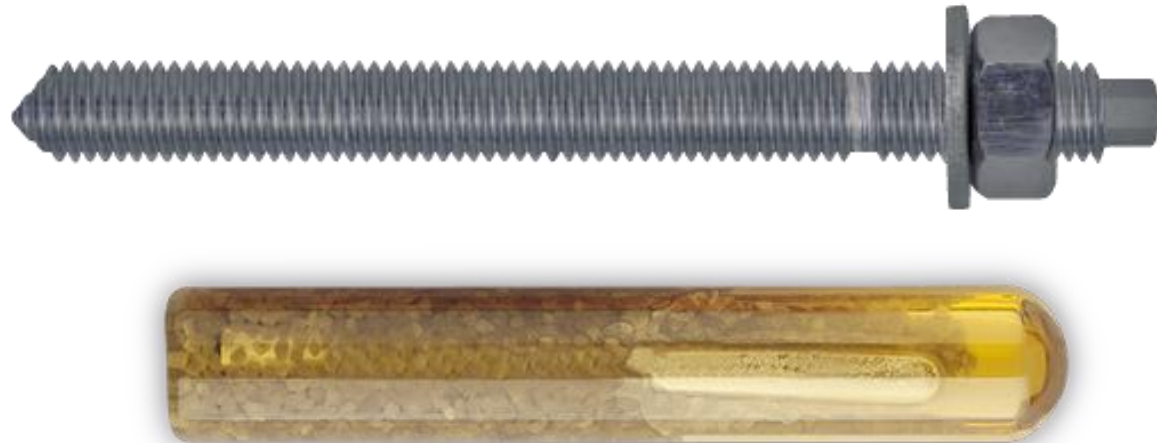
## Vinylester based Chemical Capsule Anchor



*BFK threaded bar zinclated grade 5.8*

| d x Lb  | tfix mm | hef mm | df mm | Tmax Nm | Wrench - bar | Wrench - nut | Cod.        |
|---------|---------|--------|-------|---------|--------------|--------------|-------------|
| M8x110  | 15      | 80     | 10    | 10      | 5            | 13           | 21911b08110 |
| M10x130 | 25      | 90     | 12    | 20      | 7            | 17           | 21911b10130 |
| M12x160 | 30      | 110    | 14    | 40      | 8            | 19           | 21911b12160 |
| M16x190 | 40      | 125    | 18    | 80      | 12           | 24           | 21911b16190 |
| M20x260 | 60      | 170    | 22    | 120     | 13           | 30           | 21911b20260 |
| M24x290 | 50      | 210    | 26    | 180     | 13           | 36           | 21911b24290 |
| M30x380 | 70      | 270    | 32    | 300     | 13           | 46           | 21911b30380 |

## Vinylester based Chemical Capsule Anchor



| <i>BFK threaded bar stainless steel grade A4-70</i> |         |        |       |         |              |              |             |
|---|---------|--------|-------|---------|--------------|--------------|-------------|
| d x Lb  | tfix mm | hef mm | df mm | Tmax Nm | Wrench - bar | Wrench - nut | Cod.        |
| M8x110  | 15      | 80     | 10    | 10      | 5            | 13           | 21911x08110 |
| M10x130   | 25      | 90     | 12    | 20      | 6            | 17           | 21911x10130 |
| M12x160   | 30      | 110    | 14    | 40      | 8            | 19           | 21911x12160 |
| M16x190   | 40      | 125    | 18    | 80      | 10           | 24           | 21911x16190 |
| M20x260   | 60      | 170    | 22    | 120     | 14           | 30           | 21911x20260 |
| M24x300   | 60      | 210    | 26    | 180     | 14           | 36           | 21911x24300 |
| M30x380   | 70      | 270    | 32    | 300     | 14           | 46           | 21911x30380 |

## Vinylester based Chemical Capsule Anchor



ETA-11/0155

### DESIGN<sup>(1)</sup> and RECOMMENDED<sup>(2)</sup> LOADS

Single anchor with large anchor spacing and edge distances in non-cracked **concrete C20/25**.

| Anchor diameter   |                          | M8              | M10  | M12  | M16  | M20  | M24  | M30   |       |
|---|--------------------------|-----------------|------|------|------|------|------|-------|-------|
| Nominal embedment depth   | $h_{nom}$ [mm]           | 80              | 90   | 110  | 125  | 170  | 210  | 270   |       |
| Hole diameter   | $d_o$ [mm]               | 10              | 12   | 14   | 18   | 24   | 28   | 35    |       |
| Tensile <sup>(3)</sup>  | $N_{rd}$ [kN]            | 11,9            | 14,3 | 27,8 | 33,3 | 52,8 | 77,8 | 111,1 |       |
|   | $N_{cons}$ [kN]          | 8,5             | 10,2 | 19,8 | 23,8 | 37,7 | 55,5 | 79,4  |       |
| Edge distance   | $C_{cr,N}$ [mm]          | 120             | 135  | 165  | 190  | 255  | 315  | 340   |       |
| Spacing   | $S_{cr,N}$ [mm]          | 240             | 270  | 330  | 375  | 510  | 630  | 675   |       |
| Minimum support thickness   | $h_{min}$ [mm]           | 120             | 130  | 140  | 180  | 230  | 270  | 340   |       |
| Torque max  | $T_{max}$ [Nm]           | 10              | 20   | 40   | 80   | 120  | 180  | 300   |       |
| Taglio <sup>(4)</sup> $C \geq 10xh_{ef}$<br>Shear <sup>(4)</sup> $C \geq 10xh_{ef}$ | cl. 5.8<br>grade 5.8     | $V_{rd}$ [kN]   | 7,0  | 11,2 | 16,8 | 30,8 | 49,0 | 70,0  | 112,0 |
|   |                          | $V_{cons}$ [kN] | 5,0  | 8,0  | 12,0 | 22,0 | 35,0 | 50,0  | 80,0  |
|   | cl. A4-70<br>grade A4-70 | $V_{rd}$ [kN]   | 8,3  | 12,8 | 18,6 | 35,3 | 55,0 | 79,5  | 125,0 |
|   |                          | $V_{cons}$ [kN] | 6,0  | 9,2  | 13,3 | 25,0 | 39,0 | 56,8  | 89,0  |

1kN = 100 kgf

(1)

coefficienti parziali di sicurezza  $\gamma_m$  relativi al singolo diametro (vedi ETA).

The design loads  $N_{rd}$  and  $V_{rd}$  derive from the characteristic loads on the ETA-11/0155 certification and are inclusive of the partial safety factors  $\gamma_m$  proportional to each diameter (see ETA).

(2)

The recommended loads  $N_{cons}$  and  $V_{cons}$  derive from the characteristic loads on the ETA-11/0155 certification and are inclusive of the partial safety factors  $\gamma_f=1.4$  and  $\gamma_m$  and  $g_m$  proportional to each diameter (see ETA).

(3)

Use category 1.

(4)

Shear values valid with distance from the edge  $C \geq 10xh_{ef}$ .



## Vinylester based Chemical Capsule Anchor



### Minimum installation distances

|  |   |                |            |            |            |            |            |            |     |
|--|---|----------------|------------|------------|------------|------------|------------|------------|-----|
|  | <b>Anchor diameter</b>                  | <b>M8</b>      | <b>M10</b> | <b>M12</b> | <b>M16</b> | <b>M20</b> | <b>M24</b> | <b>M30</b> |     |
|  | <b>Minimum distance from edge</b>       | $C_{min}$ [mm] | 40         | 45         | 55         | 63         | 85         | 105        | 135 |
|  | <b>Minimum distance between anchors</b> | $S_{min}$ [mm] | 40         | 45         | 55         | 63         | 85         | 105        | 135 |

Example (according to annex C of the ETAG 001) of shear load across the C20/25 concrete edge at a distance of  $C_{min}$

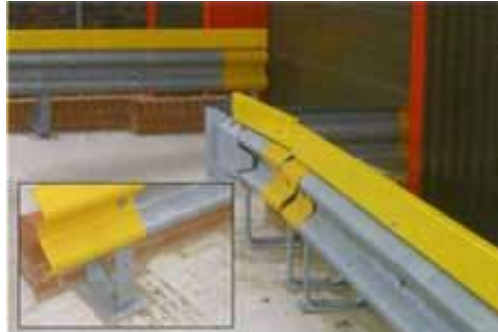
|  |                                       |                      |            |            |            |            |            |            |      |
|--|---------------------------------------|----------------------|------------|------------|------------|------------|------------|------------|------|
|  | <b>Anchor diameter</b>                | <b>M8</b>            | <b>M10</b> | <b>M12</b> | <b>M16</b> | <b>M20</b> | <b>M24</b> | <b>M30</b> |      |
|  | <b>Shear <math>C = C_{min}</math></b> | $V_{rd,cmin}$ [kN]   | 1,8        | 2,3        | 3,5        | 4,6        | 8,5        | 12,8       | 21,0 |
|  |                                       | $V_{cons,cmin}$ [kN] | 1,3        | 1,7        | 2,5        | 3,3        | 6,1        | 9,1        | 15,0 |

1kN = 100 kgf

|                               |                          |                 |            |            |            |            |            |            |     |
|-------------------------------|--------------------------|-----------------|------------|------------|------------|------------|------------|------------|-----|
| <b>Anchor diameter</b>        |                          | <b>M8</b>       | <b>M10</b> | <b>M12</b> | <b>M16</b> | <b>M20</b> | <b>M24</b> | <b>M30</b> |     |
| <b>Stressed cross-section</b> | $A_s$ [mm <sup>2</sup> ] | 36,6            | 58,0       | 84,3       | 157        | 245        | 353        | 561        |     |
|                               | <b>bar grade 5.8</b>     | $M_{cons}$ [Nm] | 11         | 21         | 37         | 95         | 185        | 320        | 640 |
|                               | <b>bar grade A4-70</b>   | $M_{cons}$ [Nm] | 12         | 24         | 42         | 107        | 208        | 360        | 720 |

# FRP

## Vinylester based Chemical Capsule Anchor



Crash barriers



Support fixings



Steel columns



Anchor fixings



Heavy Gate Anchors



Railing/Frame support



