

# Injection System VME basic

for threaded rod and post-installed rebar connection



**Cartridge VME basic 585**  
Side-by-side cartridge  
Content: 585 ml

### Injection Cartridge VME basic

- Long processing time
- No shrinkage



### Description

The Injection System VME basic also has the European Technical Assessment for post-installed rebar connection. Reinforcement Bars with diameters from 8 mm to 40 mm as well as tension anchors from M12 to M24 with a setting depth of up to 2 m can be fixed. The required drill holes can be created by hammer drilling, suction drilling or diamond drilling.

By using the hollow drill bit SB the drilling dust is sucked off during drilling directly at the point of origin. This reduces pollution and dust load of the respiratory tract to a minimum. Subsequent well cleaning - brushing and blowing out - is also no longer necessary.

### Advantages

- Long processing time, therefore ideal for large embedment depths and for high temperatures
- Wide range of application, as up to 40 mm rebar diameter allowed
- Drill hole creation with hammer drill, compressed air drill or hollow drill bit
- When using the hollow drill bit SB the subsequent cleaning of the borehole is not necessary
- Approved for installation in dry and wet concrete
- Approved for use under fire exposure
- Opened cartridges can be reused with a new static mixer
- Tie rods ZA with connecting thread M12 - M24 can be supplied in individual lengths on request

### Applications for post-installed rebar connection:

Subsequent connection of stairs, balconies, walls or columns, closing of wall and ceiling openings

### Application examples tension anchor:

Anchoring of railing posts and of supports subject to bending loads, anchoring of cantilevered components

| Description             | Ref. No. | Content ml | Content of master box pcs. | Weight per master box kg | Weight per piece kg |
|-------------------------|----------|------------|----------------------------|--------------------------|---------------------|
| Cartridge VME basic 440 | 28258143 | 440        | 12                         | 9,79                     | 0,78                |
| Cartridge VME basic 585 | 28258343 | 585        | 12                         | 12,28                    | 1,02                |
| Static mixer VM-XHP     | 28305301 | -          | 12                         | 0,18                     | 0,01                |

One static mixer VM-XHP comes with each cartridge

### Curing Time Injection Adhesive VME basic

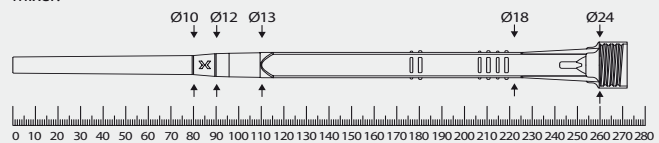
- Cartridge temperature when installing +5°C to +40°C

| Temperature (°C) of the base material | maximum working time | minimum curing time |                   |
|---------------------------------------|----------------------|---------------------|-------------------|
|                                       |                      | dry base material   | wet base material |
| +5°C to +9°C                          | 80 min               | 60 h                | 120 h             |
| +10°C to +14°C                        | 60 min               | 48 h                | 96 h              |
| +15°C to +19°C                        | 40 min               | 24 h                | 48 h              |
| +20°C to +24°C                        | 30 min               | 12 h                | 24 h              |
| +25°C to +34°C                        | 12 min               | 10 h                | 20 h              |
| +35°C to +39°C                        | 8 min                | 7 h                 | 14 h              |
| +40°C                                 | 8 min                | 4 h                 | 8 h               |

### Usable length static mixer VM-XHP

Drill holes must always be filled from the bottom of the hole to ensure no air pockets are trapped in the adhesive. This is only possible when the tip of the mixing nozzle reaches the very bottom of the drill hole before injecting the adhesive. If the mixing nozzle does not reach the bottom of the drill hole, a mixer extension tube must be used.

Outer diameter mixer:





**Extract from Permissible Service Conditions of European Technical Assessment ETA-21/0787 for use in cracked and uncracked concrete (Option 1)**

Approved loads without influence of spacing and edge distance according EN 1992-4 in dry or wet concrete for temperature range I -40°C to +24°C/+40°C<sup>1)</sup> and for temperature range II -40°C to +43°C/+70°C<sup>1)</sup>. The influence of the sustained load has been taken into account by the factor  $\Psi_{sus} = 1.0$ . A total safety factor ( $\gamma_M$  und  $\gamma_F$ ) is included. For further details and temperature ranges, see ETA.

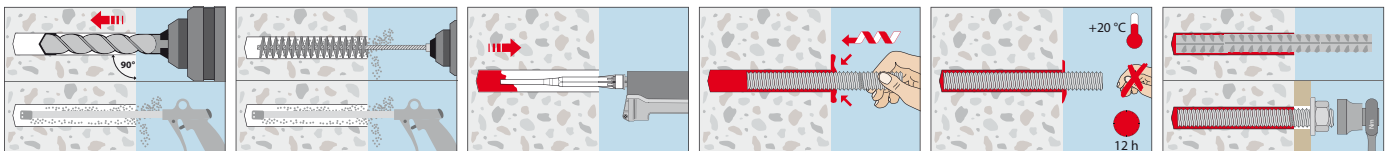
**Loads and performance data**

| <b>Injection System VME basic, threaded stud steel 5.8</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>   |              |
|--|---------------------------|--------|---------|-----------|------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|
| Range of anchorage depths  | $h_{ef,min} - h_{ef,max}$ | [mm]   |         | 60 - 160  | 60 - 200   | 70 - 240    | 80 - 320    | 90 - 400    | 96 - 480    | 108 - 540    | 120 - 600    |              |
| Approved loads, tension for $h_{ef,min} - h_{ef,max}$ cracked concrete         |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 3,6 - 8,6  | 4,5 - 13,8  | 6,3 - 20,0  | 8,8 - 37,1  | 10,5 - 58,1 | 11,5 - 73,9  | 13,7 - 93,5  | 16,1 - 115,4 |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 1,8 - 4,8  | 2,2 - 7,5   | 3,1 - 10,8  | 4,8 - 19,1  | 6,7 - 29,9  | 7,4 - 36,9   | 9,3 - 46,7   | 11,5 - 57,7  |
| Approved loads, tension for $h_{ef,min} - h_{ef,max}$ uncracked concrete       |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 7,7 - 8,6  | 8,0 - 13,8  | 10,1 - 20,0 | 12,3 - 37,1 | 14,7 - 58,1 | 16,2 - 83,8  | 19,3 - 109,5 | 22,6 - 133,3 |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 3,6 - 8,6  | 4,5 - 13,8  | 6,3 - 20,0  | 8,9 - 35,6  | 12,5 - 55,6 | 14,8 - 73,9  | 18,7 - 93,5  | 22,6 - 115,4 |
| Approved loads, shear for $h_{ef,min} - h_{ef,max}$ cracked concrete           |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 6,3        | 9,7         | 14,3        | 24,5 - 26,9 | 29,3 - 42,3 | 32,2 - 60,6  | 38,5 - 78,9  | 45,1 - 96,0  |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 5,0 - 6,3  | 6,3 - 9,7   | 8,8 - 14,3  | 13,4 - 26,9 | 18,8 - 42,3 | 20,7 - 60,6  | 26,2 - 78,9  | 32,3 - 96,0  |
| Approved loads, shear for $h_{ef,min} - h_{ef,max}$ uncracked concrete         |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 6,3        | 9,7         | 14,3        | 26,9        | 41,1 - 42,3 | 45,2 - 60,6  | 54,0 - 78,9  | 63,2 - 96,0  |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 6,3        | 9,7         | 14,3        | 24,9 - 26,9 | 35,0 - 42,3 | 41,4 - 60,6  | 52,3 - 78,9  | 63,2 - 96,0  |
| <b>Injection System VME basic, threaded stud steel 8.8</b>                     |                           |        |         |           |            |             |             |             |             |              |              |              |
| Approved loads, tension for $h_{ef,min} - h_{ef,max}$ cracked concrete         |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 3,6 - 9,6  | 4,5 - 15,0  | 6,3 - 21,5  | 8,8 - 38,3  | 10,5 - 59,8 | 11,5 - 73,9  | 13,7 - 93,5  | 16,1 - 115,4 |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 1,8 - 4,8  | 2,2 - 7,5   | 3,1 - 10,8  | 4,8 - 19,1  | 6,7 - 29,9  | 7,4 - 36,9   | 9,3 - 46,7   | 11,5 - 57,7  |
| Approved loads, tension for $h_{ef,min} - h_{ef,max}$ uncracked concrete       |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 7,7 - 13,8 | 8,0 - 21,9  | 10,1 - 31,9 | 12,3 - 59,5 | 14,7 - 93,3 | 16,2 - 134,3 | 19,3 - 175,2 | 22,6 - 213,8 |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 3,6 - 9,6  | 4,5 - 15,0  | 6,3 - 21,5  | 8,9 - 35,6  | 12,5 - 55,6 | 14,8 - 73,9  | 18,7 - 93,5  | 22,6 - 115,4 |
| Approved loads, shear for $h_{ef,min} - h_{ef,max}$ cracked concrete           |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 8,6        | 12,6 - 13,1 | 17,6 - 19,4 | 24,5 - 36,0 | 29,3 - 56,0 | 32,2 - 80,6  | 38,5 - 105,1 | 45,1 - 128,0 |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 5,0 - 8,6  | 6,3 - 13,1  | 8,8 - 19,4  | 13,4 - 36,0 | 18,8 - 56,0 | 20,7 - 80,6  | 26,2 - 105,1 | 32,3 - 128,0 |
| Approved loads, shear for $h_{ef,min} - h_{ef,max}$ uncracked concrete         |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 8,6        | 13,1        | 19,4        | 34,4 - 36,0 | 41,1 - 56,0 | 45,2 - 80,6  | 54,0 - 105,1 | 63,2 - 128,0 |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 8,6        | 12,6 - 13,1 | 17,6 - 19,4 | 24,9 - 36,0 | 35,0 - 56,0 | 41,4 - 80,6  | 52,3 - 105,1 | 63,2 - 128,0 |
| <b>Injection System VME basic, threaded stud stainless steel A4-70, HCR-70</b> |                           |        |         |           |            |             |             |             |             |              |              |              |
| Approved loads, tension for $h_{ef,min} - h_{ef,max}$ cracked concrete         |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 3,6 - 9,6  | 4,5 - 15,0  | 6,3 - 21,5  | 8,8 - 38,3  | 10,5 - 59,8 | 11,5 - 73,9  | 13,7 - 57,4  | 16,1 - 70,2  |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 1,8 - 4,8  | 2,2 - 7,5   | 3,1 - 10,8  | 4,8 - 19,1  | 6,7 - 29,9  | 7,4 - 36,9   | 9,3 - 46,7   | 11,5 - 57,7  |
| Approved loads, tension for $h_{ef,min} - h_{ef,max}$ uncracked concrete       |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 7,7 - 9,9  | 8,0 - 15,7  | 10,1 - 22,5 | 12,3 - 42,0 | 14,7 - 65,3 | 16,2 - 94,3  | 19,3 - 57,4  | 22,6 - 70,2  |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. N | [kN]      | 3,6 - 9,6  | 4,5 - 15,0  | 6,3 - 21,5  | 8,9 - 35,6  | 12,5 - 55,6 | 14,8 - 73,9  | 18,7 - 57,4  | 22,6 - 70,2  |
| Approved loads, shear for $h_{ef,min} - h_{ef,max}$ cracked concrete           |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 6,0        | 9,2         | 13,7        | 24,5 - 25,2 | 29,3 - 39,4 | 32,2 - 56,8  | 34,5         | 42,0         |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 5,0 - 6,0  | 6,3 - 9,2   | 8,8 - 13,7  | 13,4 - 25,2 | 18,8 - 39,4 | 20,7 - 56,8  | 26,2 - 34,5  | 32,3 - 42,0  |
| Approved loads, shear for $h_{ef,min} - h_{ef,max}$ uncracked concrete         |                           |        |         |           |            |             |             |             |             |              |              |              |
| Range of temperature   | 24°C/40°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 6,0        | 9,2         | 13,7        | 25,2        | 39,4        | 45,2 - 56,8  | 34,5         | 42,0         |
|  | 43°C/70°C <sup>1)</sup>   | C20/25 | appr. V | [kN]      | 6,0        | 9,2         | 13,7        | 24,9 - 25,2 | 35,0 - 39,4 | 41,4 - 56,8  | 34,5         | 42,0         |
| <b>Spacing and edge distance</b>   |                           |        |         |           |            |             |             |             |             |              |              |              |
| Min. thickness of concrete for $h_{ef,min} - h_{ef,max}$                       | $h_{min}$                 | [mm]   |         | 100 - 190 | 100 - 230  | 100 - 270   | 116 - 356   | 134 - 444   | 152 - 536   | 168 - 600    | 190 - 670    |              |
| Minimum spacing  | $s_{min}$                 | [mm]   |         | 40        | 50         | 60          | 75          | 95          | 115         | 125          | 140          |              |
| Minimum edge distance  | $c_{min}$                 | [mm]   |         | 35        | 40         | 45          | 50          | 60          | 65          | 75           | 80           |              |
| <b>Installation parameters</b>   |                           |        |         |           |            |             |             |             |             |              |              |              |
| Drill hole diameter  | $d_o$                     | [mm]   |         | 10        | 12         | 14          | 18          | 22          | 28          | 30           | 35           |              |
| Clearance hole in the fixture for Pre-setting installation                     | $d_{f \leq}$              | [mm]   |         | 9         | 12         | 14          | 18          | 22          | 26          | 30           | 33           |              |
| Clearance hole in the fixture for Through-setting installation                 | $d_{f \leq}$              | [mm]   |         | 12        | 14         | 16          | 20          | 24          | 30          | 33           | 40           |              |
| Range of drill hole depth for $h_{ef,min} - h_{ef,max}$                        | $h_o$                     | [mm]   |         | 60 - 160  | 60 - 200   | 70 - 240    | 80 - 320    | 90 - 400    | 96 - 480    | 108 - 540    | 120 - 600    |              |
| Installation torque  | $T_{inst \leq}$           | [Nm]   |         | 10        | 20         | 40          | 60          | 100         | 170         | 250          | 300          |              |
| Amount of adhesive per 100 mm drill hole depth                                 |                           | [ml]   |         | 6,53      | 8,16       | 9,82        | 13,61       | 17,89       | 32,25       | 30,69        | 48,67        |              |

<sup>1)</sup>max. long term temperature / max. short term temperature

Higher concrete strength may lead to higher approved loads. Using a hollow drill bit without subsequent cleaning can lead to lower loads in uncracked concrete. Technical data see European Technical Assessment ETA-21/0787.

**Installation**





### Extract from Permissible Service Conditions of European Technical Assessment ETA-21/0787 for use in cracked and uncracked concrete (Option 1)

Approved loads according to EN 1992-4 for single anchors without the influence of spacing and edge distances in dry and wet concrete with compressed air cleaning for temperature range I -40°C to +24°C (short term temperature +40°C) and for temperature range II -40°C to +43°C (short term temperature +70°C). The influence of the sustained load has been taken into account by the factor  $\Psi_{sus} = 1,0$  and the total safety factor ( $\gamma_M$  and  $\gamma_p$ ) is included. For further details and temperature ranges see ETA.

| Loads and performance data   |                 |      |      | IG M6 x 80              | IG M6 x 90 | IG M8 x 80 | IG M8 x 100 | IG M10 x 80 | IG M10 x 100 | IG M12 x125 | IG M16 x 170 | IG M20 x 200 |      |      |      |      |
|--|-----------------|------|------|-------------------------|------------|------------|-------------|-------------|--------------|-------------|--------------|--------------|------|------|------|------|
| <b>Internally Threaded Sleeve</b>  |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Anchorage depth $h_{ef}$   |                 |      | [mm] | 80                      | 90         | 80         | 100         | 80          | 100          | 125         | 170          | 200          |      |      |      |      |
| <b>Injection System VME basic, Internally Threaded Sleeve VMU-IG steel 5.8</b>                     |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Approved loads, tension for $h_{ef}$   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Range of temperature   |                 |      |      | 24°C/40°C <sup>1)</sup> | C20/25     | appr. N    | [kN]        | 4,8         | 4,8          | 7,2         | 8,1          | 11,7         | 16,4 | 26,0 | 33,1 |      |
|  |                 |      |      | 43°C/70°C <sup>1)</sup> | C20/25     | appr. N    | [kN]        | 3,0         | 3,4          | 3,6         | 4,5          | 4,8          | 6,0  | 9,3  | 13,1 | 19,2 |
| Approved loads, tension for $h_{ef}$   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Range of temperature   |                 |      |      | 24°C/40°C <sup>1)</sup> | C20/25     | appr. N    | [kN]        | 4,8         | 4,8          | 8,1         | 8,1          | 12,0         | 13,8 | 20,0 | 36,2 | 47,3 |
|  |                 |      |      | 43°C/70°C <sup>1)</sup> | C20/25     | appr. N    | [kN]        | 4,8         | 4,8          | 7,2         | 8,1          | 8,9          | 11,1 | 17,4 | 26,2 | 38,5 |
| Approved loads, shear for $h_{ef}$   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Range of temperature   |                 |      |      | 24°C/40°C <sup>1)</sup> | C20/25     | appr. V    | [kN]        | 3,4         | 3,4          | 5,7         | 5,7          | 9,7          | 9,7  | 14,3 | 25,7 | 42,3 |
|  |                 |      |      | 43°C/70°C <sup>1)</sup> | C20/25     | appr. V    | [kN]        | 3,4         | 3,4          | 5,7         | 5,7          | 9,7          | 9,7  | 14,3 | 25,7 | 42,3 |
| Approved loads, shear for $h_{ef}$   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Range of temperature   |                 |      |      | 24°C/40°C <sup>1)</sup> | C20/25     | appr. V    | [kN]        | 3,4         | 3,4          | 5,7         | 5,7          | 9,7          | 9,7  | 14,3 | 25,7 | 42,3 |
|  |                 |      |      | 43°C/70°C <sup>1)</sup> | C20/25     | appr. V    | [kN]        | 3,4         | 3,4          | 5,7         | 5,7          | 9,7          | 9,7  | 14,3 | 25,7 | 42,3 |
| <b>Injection System VME basic, Internally Threaded Sleeve VMU-IG Stainless steel A4-70, HCR-70</b> |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Approved loads, tension for $h_{ef}$   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Range of temperature   |                 |      |      | 24°C/40°C <sup>1)</sup> | C20/25     | appr. N    | [kN]        | 5,3         | 5,3          | 7,2         | 9,0          | 8,4          | 11,7 | 16,4 | 26,0 | 31,0 |
|  |                 |      |      | 43°C/70°C <sup>1)</sup> | C20/25     | appr. N    | [kN]        | 3,0         | 3,4          | 3,6         | 4,5          | 4,8          | 6,0  | 9,3  | 13,1 | 19,2 |
| Approved loads, tension for $h_{ef}$   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Range of temperature   |                 |      |      | 24°C/40°C <sup>1)</sup> | C20/25     | appr. N    | [kN]        | 5,3         | 5,3          | 9,9         | 9,9          | 12,0         | 15,7 | 22,5 | 37,1 | 31,0 |
|  |                 |      |      | 43°C/70°C <sup>1)</sup> | C20/25     | appr. N    | [kN]        | 5,3         | 5,3          | 7,2         | 9,0          | 8,9          | 11,1 | 17,4 | 26,2 | 31,0 |
| Approved loads, shear for $h_{ef}$   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Range of temperature   |                 |      |      | 24°C/40°C <sup>1)</sup> | C20/25     | appr. V    | [kN]        | 3,2         | 3,2          | 6,0         | 6,0          | 9,2          | 9,2  | 13,7 | 25,2 | 18,6 |
|  |                 |      |      | 43°C/70°C <sup>1)</sup> | C20/25     | appr. V    | [kN]        | 3,2         | 3,2          | 6,0         | 6,0          | 9,2          | 9,2  | 13,7 | 25,2 | 18,6 |
| Approved loads, shear for $h_{ef}$   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Range of temperature   |                 |      |      | 24°C/40°C <sup>1)</sup> | C20/25     | appr. V    | [kN]        | 3,2         | 3,2          | 6,0         | 6,0          | 9,2          | 9,2  | 13,7 | 25,2 | 18,6 |
|  |                 |      |      | 43°C/70°C <sup>1)</sup> | C20/25     | appr. V    | [kN]        | 3,2         | 3,2          | 6,0         | 6,0          | 9,2          | 9,2  | 13,7 | 25,2 | 18,6 |
| <b>Spacing and edge distance</b>   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Min. thickness of concrete for $h_{ef}$  | $h_{min}$       | [mm] |      | 110                     | 120        | 110        | 130         | 116         | 136          | 169         | 226          | 270          |      |      |      |      |
| Minimum spacing  | $s_{min}$       | [mm] |      | 50                      | 50         | 60         | 60          | 75          | 75           | 95          | 115          | 140          |      |      |      |      |
| Minimum edge distance  | $c_{min}$       | [mm] |      | 40                      | 40         | 45         | 45          | 50          | 50           | 60          | 65           | 80           |      |      |      |      |
| <b>Installation parameters</b>   |                 |      |      |                         |            |            |             |             |              |             |              |              |      |      |      |      |
| Drill hole diameter  | $d_o$           | [mm] |      | 12                      | 12         | 14         | 14          | 18          | 18           | 22          | 28           | 35           |      |      |      |      |
| Clearance hole in the fixture  | $d_{r \leq}$    | [mm] |      | 7                       | 7          | 9          | 9           | 12          | 12           | 14          | 18           | 22           |      |      |      |      |
| Drill hole depth for $h_{ef}$  | $h_o$           | [mm] |      | 80                      | 90         | 80         | 100         | 80          | 100          | 125         | 170          | 200          |      |      |      |      |
| Installation torque  | $T_{inst \leq}$ | [Nm] |      | 10                      | 10         | 10         | 10          | 20          | 20           | 40          | 60           | 100          |      |      |      |      |
| Amount of adhesive per 100mm drill hole  |                 | [ml] |      | 6,6                     | 7,4        | 7,9        | 9,9         | 10,9        | 13,6         | 22,4        | 54,9         | 97,4         |      |      |      |      |

<sup>1)</sup>Max. long term temperature/max. short term temperature

Higher concrete strength may lead to higher approved loads. Using a hollow drill bit without subsequent cleaning can lead to lower loads in uncracked concrete. Technical data see European Technical Assessment ETA-21/0787.

| <b>Injection System VME basic, rebar B500B</b>           |           |      |  | Ø8                        | Ø10                      | Ø12                                 | Ø14       | Ø16         | Ø20         | Ø24         | Ø25         | Ø28         | Ø32         |              |              |              |              |
|--|-----------|------|--|---------------------------|--------------------------|-------------------------------------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|
| Range of anchorage depths                                |           |      |  | $h_{ef,min} - h_{ef,max}$ | [mm]                     | 60 - 160                            | 60 - 200  | 70 - 240    | 75 - 280    | 80 - 320    | 90 - 400    | 96 - 480    | 100 - 500   | 112 - 560    | 128 - 640    |              |              |
| Approved loads, tension for $h_{ef,min} - h_{ef,max}$    |           |      |  |                           |                          |                                     |           |             |             |             |             |             |             |              |              |              |              |
| Range of temperature                                     |           |      |  | 24°C/40°C <sup>1)</sup>   | C20/25                   | appr. N                             | [kN]      | 4,3 - 11,5  | 6,3 - 20,9  | 8,8 - 30,2  | 10,2 - 38,1 | 12,3 - 49,8 | 14,6 - 71,8 | 16,1 - 103,4 | 17,1 - 112,2 | 20,3 - 129,0 | 24,8 - 168,5 |
|  |           |      |  | 43°C/70°C <sup>1)</sup>   | C20/25                   | appr. N                             | [kN]      | 1,8 - 4,8   | 2,2 - 7,5   | 3,1 - 10,8  | 3,9 - 14,7  | 4,8 - 19,1  | 6,7 - 29,9  | 8,6 - 43,1   | 9,3 - 46,7   | 11,7 - 58,6  | 15,3 - 76,6  |
| Approved loads, tension for $h_{ef,min} - h_{ef,max}$    |           |      |  |                           |                          |                                     |           |             |             |             |             |             |             |              |              |              |              |
| Range of temperature                                     |           |      |  | 24°C/40°C <sup>1)</sup>   | C20/25                   | appr. N                             | [kN]      | 10,1 - 13,8 | 11,2 - 21,6 | 14,1 - 31,2 | 15,6 - 42,4 | 17,2 - 55,4 | 20,5 - 86,6 | 22,6 - 124,6 | 24,0 - 135,2 | 28,5 - 169,6 | 34,8 - 221,6 |
|  |           |      |  | 43°C/70°C <sup>1)</sup>   | C20/25                   | appr. N                             | [kN]      | 4,3 - 11,5  | 5,4 - 18,0  | 7,5 - 25,9  | 9,4 - 35,2  | 11,5 - 46,0 | 14,8 - 65,8 | 19,0 - 94,8  | 20,6 - 102,8 | 23,5 - 117,3 | 30,6 - 153,2 |
| Approved loads, shear for $h_{ef,min} - h_{ef,max}$      |           |      |  |                           |                          |                                     |           |             |             |             |             |             |             |              |              |              |              |
| Range of temperature                                     |           |      |  | 24°C/40°C <sup>1)</sup>   | C20/25                   | appr. V                             | [kN]      | 6,5         | 10,1        | 14,5        | 19,8        | 24,5 - 25,9 | 29,3 - 40,4 | 32,2 - 58,2  | 34,3 - 63,1  | 40,6 - 79,2  | 49,7 - 103,4 |
|  |           |      |  | 43°C/70°C <sup>1)</sup>   | C20/25                   | appr. V                             | [kN]      | 3,6 - 6,5   | 4,5 - 10,1  | 6,3 - 14,5  | 7,9 - 19,8  | 9,6 - 25,9  | 13,5 - 40,4 | 17,2 - 58,2  | 18,7 - 63,1  | 23,5 - 79,2  | 30,6 - 103,4 |
| Approved loads, shear for $h_{ef,min} - h_{ef,max}$      |           |      |  |                           |                          |                                     |           |             |             |             |             |             |             |              |              |              |              |
| Range of temperature                                     |           |      |  | 24°C/40°C <sup>1)</sup>   | C20/25                   | appr. V                             | [kN]      | 6,5         | 10,1        | 14,5        | 19,8        | 25,9        | 40,4        | 45,2 - 58,2  | 48,1 - 63,1  | 57,0 - 79,2  | 69,6 - 103,4 |
|  |           |      |  | 43°C/70°C <sup>1)</sup>   | C20/25                   | appr. V                             | [kN]      | 6,5         | 10,1        | 14,5        | 18,8 - 19,8 | 23,0 - 25,9 | 29,6 - 40,4 | 37,9 - 58,2  | 41,1 - 63,1  | 46,9 - 79,2  | 61,3 - 103,4 |
| <b>Spacing and edge distance</b>                         |           |      |  |                           |                          |                                     |           |             |             |             |             |             |             |              |              |              |              |
| Min. thickness of concrete for $h_{ef,min} - h_{ef,max}$ | $h_{min}$ | [mm] |  | 100 - 190                 | 100 - 230                | 100 - 270 / 102 - 272 <sup>2)</sup> | 111 - 316 | 120 - 360   | 140 - 450   | 160 - 544   | 164 - 564   | 182 - 630   | 208 - 720   |              |              |              |              |
| Minimum spacing  | $s_{min}$ | [mm] |  | 40                        | 50                       | 60                                  | 70        | 75          | 95          | 120         | 120         | 130         | 150         |              |              |              |              |
| Minimum edge distance                                    | $c_{min}$ | [mm] |  | 35                        | 40                       | 45                                  | 50        | 50          | 60          | 70          | 70          | 75          | 85          |              |              |              |              |
| <b>Installation parameters</b>                           |           |      |  |                           |                          |                                     |           |             |             |             |             |             |             |              |              |              |              |
| Drill hole diameter                                      | $d_o$     | [mm] |  | 10/12 <sup>3)</sup>       | 12/14 <sup>2)</sup>      | 14/16 <sup>2)</sup>                 | 18        | 20          | 25          | 32          | 32          | 35          | 40          |              |              |              |              |
| Range of drill hole depth for $h_{ef,min} - h_{ef,max}$  | $h_o$     | [mm] |  | 60 - 160                  | 60 - 200                 | 70 - 240                            | 75 - 280  | 80 - 320    | 90 - 400    | 96 - 480    | 100 - 500   | 112 - 560   | 128 - 640   |              |              |              |              |
| Amount of adhesive per 100 mm drill hole depth           |           | [ml] |  | 4,16/8,46 <sup>3)</sup>   | 5,07/10,12 <sup>3)</sup> | 5,97/11,78 <sup>3)</sup>            | 13,44     | 15,09       | 23,11       | 44,65       | 40,03       | 44,22       | 57,32       |              |              |              |              |

<sup>1)</sup>Max. long term temperature/max. short term temperature

<sup>2)</sup>For rebar Ø8, Ø10 and Ø12 both drill hole diameters are possible

<sup>3)</sup>The first value applies to the smaller drill diameter, the second value to the larger drill diameter.

Higher concrete strength may lead to higher approved loads. Using a hollow drill bit without subsequent cleaning can lead to lower loads in uncracked concrete. Technical data see European Technical Assessment ETA-21/0787.