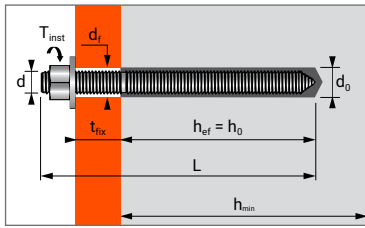




## Epoxyacrylate resin for use in non-cracked concrete



### TECHNICAL DATA

| RANGE                      | Min. anchor depth       | Max. thick. of part to be fixed | Min. thick. of base material | Thread diameter | Drilling depth         | Drilling diameter      | Clearance diameter     | Total anchor length | Tighten torque            | Code <sup>(1)</sup> SPIT stud |                    |
|----------------------------|-------------------------|---------------------------------|------------------------------|-----------------|------------------------|------------------------|------------------------|---------------------|---------------------------|-------------------------------|--------------------|
|                            | (mm)<br>h <sub>ef</sub> | (mm)<br>t <sub>fix</sub>        | (mm)<br>h <sub>min</sub>     | (mm)<br>d       | (mm)<br>h <sub>o</sub> | (mm)<br>d <sub>o</sub> | (mm)<br>d <sub>f</sub> | (mm)<br>L           | (Nm)<br>T <sub>inst</sub> | zinc coated steel             | stainless steel A4 |
| M8X110                     | 80                      | 15                              | 110                          | 8               | 80                     | 10                     | 9                      | 110                 | 10                        | 060215                        | 060222             |
| M10X130                    | 90                      | 20                              | 120                          | 10              | 90                     | 12                     | 12                     | 130                 | 20                        | 060216                        | 060223             |
| M12X160                    | 110                     | 25                              | 140                          | 12              | 110                    | 14                     | 14                     | 160                 | 30                        | 060217                        | 060224             |
| M16X190                    | 125                     | 35                              | 160                          | 16              | 125                    | 18                     | 18                     | 190                 | 60                        | 060218                        | 060225             |
| M20X260                    | 170                     | 65                              | 220                          | 20              | 170                    | 25                     | 22                     | 260                 | 120                       | 060219                        | 060226             |
| M24X300                    | 210                     | 63                              | 265                          | 24              | 210                    | 28                     | 26                     | 300                 | 200                       | 060220                        | 060227             |
| MULTI-MAX cartridge 410 ml |                         |                                 |                              |                 |                        |                        |                        |                     |                           | 060047                        |                    |
| MULTI-MAX cartridge 280 ml |                         |                                 |                              |                 |                        |                        |                        |                     |                           | 060040                        |                    |

### CHARACTERISTICS



<sup>(1)</sup>These are SPIT Studs, for standard Studs (zinc coated or stainless steel versions) see catalogue.

### APPLICATION

- Fixing steel framed structures
- Fixing machinery (resistant to vibration)
- Fixing of storage silos, refinery pipework supports
- Fixing motorway signs
- Fixing safety barriers
- \* ETA - 13/0436: for post-installed rebars applications

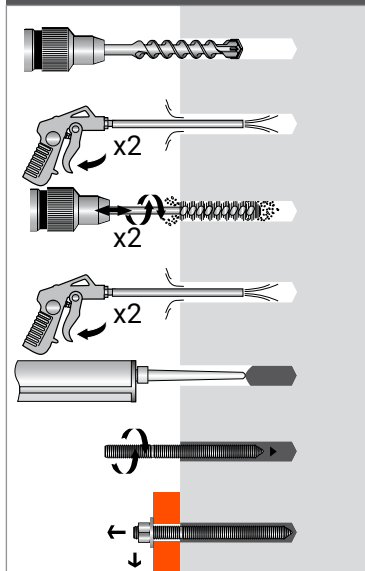
### FIELD OF USE

- Shelf life : 18 months  
 Installation temperature: -5°C / +40°C  
 In-Service temperature range:  
 - Range 1: -40°C / +40°C  
 - Range 2: - 40°C /+80°C  
 Installation conditions:  
 - Category 1: Dry or wet concrete

### ANCHOR MECHANICAL PROPERTIES

| SIZE                                 | M8                            | M10 | M12 | M16 | M20 | M24 |     |
|--------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|
| <b>SPIT Studs</b>                    |                               |     |     |     |     |     |     |
| f <sub>uk</sub> [N/mm <sup>2</sup> ] | Min. tensile strength         | 600 | 600 | 600 | 600 | 520 | 520 |
| f <sub>yk</sub> [N/mm <sup>2</sup> ] | Yield strength                | 420 | 420 | 420 | 420 | 420 | 420 |
| M <sup>0</sup> <sub>Rk,s</sub> [Nm]  | Characteristic bending moment | 22  | 45  | 79  | 200 | 301 | 520 |
| <b>Studs Grade A4-70</b>             |                               |     |     |     |     |     |     |
| f <sub>uk</sub> [N/mm <sup>2</sup> ] | Min. tensile strength         | 700 | 700 | 700 | 700 | 700 | 700 |
| f <sub>yk</sub> [N/mm <sup>2</sup> ] | Yield strength                | 350 | 350 | 350 | 350 | 350 | 350 |
| M <sup>0</sup> <sub>Rk,s</sub> [Nm]  | Characteristic bending moment | 26  | 52  | 92  | 233 | 454 | 786 |

### INSTALLATION



### SETTING TIME

| TEMPERATURE | MAX. TIME FOR INSTALLATION | CURING TIME |
|-------------|----------------------------|-------------|
| -5°C ▶ 0°C  | -                          | 360 min.    |
| 0°C ▶ 5°C   | 18 min.                    | 180 min.    |
| 5°C ▶ 10°C  | 12 min.                    | 90 min.     |
| 10°C ▶ 20°C | 6 min.                     | 60 min.     |
| 20°C ▶ 30°C | 4 min.                     | 45 min.     |
| 30°C ▶ 40°C | 2 min.                     | 35 min.     |



## MINIMUM THICKNESS OF CONCRETE, CHARACTERISTIC & MINIMUM DISTANCES FOR SPACING, EDGE

| SIZE  |               |      | M8  | M10 | M12 | M16   | M20 | M24 |
|---|---------------|------|-----|-----|-----|-------|-----|-----|
| Anchorage depth   | $h_{ef}$      | [mm] | 80  | 90  | 110 | 125   | 170 | 210 |
| Minimum thickness of base material                                | $h_{min}$     | [mm] | 110 | 120 | 140 | 155   | 214 | 262 |
| Characteristic edge and spacing distance for full anchor capacity | $C_{cr} \geq$ | [mm] | 120 | 135 | 165 | 187,5 | 255 | 315 |
|   | $S_{cr} \geq$ | [mm] | 240 | 270 | 330 | 375   | 510 | 630 |
| Minimum distances for non-cracked concrete                        | $C_{min}$     | [mm] | 40  | 50  | 60  | 80    | 100 | 120 |
|   | $S \geq$      | [mm] | 40  | 50  | 60  | 80    | 100 | 120 |
|   | $S_{min}$     | [mm] | 40  | 50  | 60  | 80    | 100 | 120 |
|   | $C \geq$      | [mm] | 40  | 50  | 60  | 80    | 100 | 120 |

## CHARACTERISTIC RESISTANCES [kN]

Characteristic resistances are shown as informative, and have to be used by application of safety factors .

In tensile loads, the table below shows bond strength in N/mm<sup>2</sup>. All dimensions can be installed with embedment length between 8d to 12d.

The characteristic tensile load is determined with the formular :  $N_{Rk,p}^0 = \pi \cdot d \cdot h_{ef} \cdot \tau_{Rk}$

### TENSILE

#### NON-CRACKED CONCRETE - C20/25

| SIZE                                  | M8  | M10 | M12 | M16 | M20 | M24 |
|---------------------------------------|-----|-----|-----|-----|-----|-----|
| $h_{ef\ min}$ [mm]                    | 64  | 80  | 96  | 128 | 160 | 192 |
| $h_{ef\ max}$ [mm]                    | 96  | 120 | 144 | 192 | 240 | 288 |
| $\tau_{Rk,uncr}$ [N/mm <sup>2</sup> ] | 9,0 | 9,0 | 8,5 | 8,0 | 8,0 | 7,5 |

### SHEAR

#### NON-CRACKED CONCRETE - C20/25 to C50/60

| SIZE                     | M8          | M10         | M12         | M16         | M20         | M24          |
|--------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| $h_{ef\ min}$ [mm]       | 64          | 80          | 96          | 128         | 160         | 192          |
| $h_{ef\ max}$ [mm]       | 96          | 120         | 144         | 192         | 240         | 288          |
| <b>SPIT Studs</b>        |             |             |             |             |             |              |
| $V_{Rks}$ [kN]           | <u>9,2</u>  | <u>15,0</u> | <u>21,0</u> | <u>39,0</u> | <u>61,0</u> | <u>88,0</u>  |
| <b>Studs Grade A4-70</b> |             |             |             |             |             |              |
| $V_{Rks}$ [kN]           | <u>13,0</u> | <u>20,0</u> | <u>30,0</u> | <u>55,0</u> | <u>86,0</u> | <u>124,0</u> |

## RECOMMENDED LOADS OF ONE ANCHOR WITHOUT INFLUENCE OF SPACING & CONCRETE EDGE [kN]

Recommended values are determined from performances given in the ETA, and are guaranteed for spacing  $\geq S_{cr}$  and edge distance  $\geq C_{cr}$ .

### TENSILE

#### NON-CRACKED CONCRETE - C20/25

| SIZE                     | M8  | M10  | M12  | M16  | M20  | M24  |
|--------------------------|-----|------|------|------|------|------|
| $h_{ef}$ [mm]            | 80  | 90   | 110  | 125  | 170  | 210  |
| <b>SPIT Studs</b>        |     |      |      |      |      |      |
| $N_{Rec}$ [kN]           | 7,2 | 10,1 | 14,0 | 19,9 | 33,9 | 47,1 |
| <b>Studs Grade A4-70</b> |     |      |      |      |      |      |
| $N_{Rec}$ [kN]           | 7,2 | 10,1 | 14,0 | 19,9 | 33,9 | 47,1 |

$N_{Rec} = \min [N_{Rd,p}; N_{Rd,c}; N_{Rd,s}] / \gamma_F; \gamma_F = 1,4$

### SHEAR

#### NON-CRACKED CONCRETE - C20/25 to C50/60

| SIZE                     | M8         | M10        | M12         | M16         | M20         | M24         |
|--------------------------|------------|------------|-------------|-------------|-------------|-------------|
| $h_{ef}$ [mm]            | 80         | 90         | 110         | 125         | 170         | 210         |
| <b>SPIT Studs</b>        |            |            |             |             |             |             |
| $V_{Rec}$ [kN]           | <u>5,1</u> | <u>8,6</u> | <u>12,0</u> | <u>22,3</u> | <u>34,9</u> | <u>50,3</u> |
| <b>Studs Grade A4-70</b> |            |            |             |             |             |             |
| $V_{Rec}$ [kN]           | <u>6,0</u> | <u>9,2</u> | <u>13,7</u> | <u>25,2</u> | <u>39,4</u> | <u>56,8</u> |

$V_{Rec} = V_{Rd,s} / \gamma_F; \gamma_F = 1,4$

Design resistances for static loads are determined from performances given in the ETA, and are guaranteed for spacing  $\geq S_{cr}$  and edge distance  $\geq C_{cr}$ .

For project with reduced spacing and edge distance, we recommend to use SPIT i-Expert software to design your project according to EN 1992-4.



## DESIGN RESISTANCE FOR STATIC LOADS IN NON CRACKED CONCRETE [kN]

### TENSILE

| SIZE                     | M8     | M10  | M12  | M16  | M20  | M24  |      |
|--------------------------|--------|------|------|------|------|------|------|
| $h_{ef}$ [mm]            | 80     | 90   | 110  | 125  | 170  | 210  |      |
| <b>SPIT Studs</b>        |        |      |      |      |      |      |      |
| $N_{Rd,uncr}$ [kN]       | C20/25 | 10,1 | 14,1 | 19,6 | 27,9 | 47,5 | 66,0 |
| <b>Studs Grade A4-70</b> |        |      |      |      |      |      |      |
| $N_{Rd,uncr}$ [kN]       | C20/25 | 10,1 | 14,1 | 19,6 | 27,9 | 47,5 | 66,0 |

Distances  $S_{cr}$  and  $C_{cr}$  must be fulfilled  
 $N_{Rd,uncr} = \min [N_{Rk,p,uncr} / \gamma_{Mc}; N_{Rk,s} / \gamma_{Ms,N}]$   
 $\gamma_{Mc} = 1,8$ ; SPIT Studs :  $\gamma_{Ms,N} = 1,5$ ; Studs Grade A4-70 :  $\gamma_{Ms,N} = 1,87$

### SHEAR

| SIZE                     | M8            | M10        | M12         | M16         | M20         | M24         |             |
|--------------------------|---------------|------------|-------------|-------------|-------------|-------------|-------------|
| $h_{ef}$ [mm]            | 80            | 90         | 110         | 125         | 170         | 210         |             |
| <b>SPIT Studs</b>        |               |            |             |             |             |             |             |
| $V_{Rd,s}$ [kN]          | $\geq C20/25$ | <u>7,2</u> | <u>12,0</u> | <u>16,8</u> | <u>31,2</u> | <u>48,8</u> | <u>70,4</u> |
| <b>Studs Grade A4-70</b> |               |            |             |             |             |             |             |
| $V_{Rd,s}$ [kN]          | $\geq C20/25$ | <u>8,3</u> | <u>12,8</u> | <u>19,2</u> | <u>35,3</u> | <u>55,1</u> | <u>79,5</u> |

$V_{Rd,s} = V_{Rk,s} / \gamma_{Ms,V}$   
 SPIT Studs :  $\gamma_{Ms,V} = 1,25$ ; Studs Grade A4-70 :  $\gamma_{Ms,V} = 1,56$

**Nota:** The values indicated *in italics and underlined* correspond to steel failure