

POINT 430 VINYL FIX

Vinylester resin styrene free



POINT 430 VINYL FIX is a bi-component vinylester styrene free chemical anchor for structural/ high loads, CE marked and ETA assessed for use in concrete. It is certified for threaded rods to be used in non-cracked concrete from diameters M8 to M30, in cracked concrete from diameters M10 to M20, in solid masonry from diameters M8 to M16, in hollow masonry from diameters M8 to M12 and in timber from diameters M8 to M16. It is certified for rebars to be used in non-cracked concrete from diameters Ø8 mm to Ø32 mm and for post-installed rebar connections in reinforced concrete for diameters from Ø8 mm to Ø32 mm. This resin has seismic qualification, fire resistance and chemical resistance. It can be used when base material temperature is between -10°C and +40°C. Suitable for use in wet concrete and flooded holes. Due to its strong adhesion and ease of penetration into holes and hollow materials, the resin allows a secure attachment without expansion and without stresses in the base material, which allows you to make fixings close to the corners and edges of base material.

Description:

ETA (European Technical Assessments) updated according to the Construction Product Regulation 305/2011.

ETA-09/0140: Assessment according to EAD-330499 for uncracked concrete, Option 7, for diameters from M8 to M30 and for rebars from Ø8 mm to Ø32 mm. Performace for cracked concrete, Option 1, with rod M10-M12- M16-M20.

Seismic qualification according to EOTA Technical Report TR049. The product is qualified in seismic category C1 for diameters M12-M16-M20 and seismic category C2 for diameters M12-M16. The product is homologated for fixings with a variable anchorage depth, to give the designer a high degree of flexibility. Maximum anchoring depth up to twenty times the nominal diameter of the threaded rod. Certified service temperatures are in the ranges: -40°C/+40°C (T° max long period = +24°C), -40°C/+80°C (T° max long period = +50°C) and -40°C/+120°C (T° max long period = +72°C).

ETA-09/0246: Assessment according to EAD-330087 for post-installed rebar connections in reinforced concrete for diameters from Ø8 mm to Ø32 mm. Minimum anchorage depth according to Eurocode 2 in case of uncracked and cracked concrete. Fire resistance, up to a maximum of R240. Assessment for seismic condition according to the EAD 331522 for diameters from Ø12 mm to Ø32 mm. Certified service temperatures are in the range: -40°C/+80°C (T° max long period = +50°C). Concrete category CI 0,4 max. Possibility of installing the anchor using hollow drill bits. This installation mode avoids the dust removal procedure by means of a blower pump and a metal brush, and thus significantly reduces the installation time. Possibility to use the product in dry, wet concrete and with flooded hole (flooded hole only with threaded bars). The product hardening reaction also takes place in the presence of water. Base material temperature (concrete, bricks, etc...) for installation should be between -10 °C and +40 °C.

Suitable also for base material like solid and hollow masonry, wood. VOC according to the French Decree 2011-321 and according to the standard ISO 16000/EN 16516.

TECHNICAL DATA SHEET



Excellent adhesion to:

- Concrete
- Bricks
- Metal
- Wood

Advantages

- Plastic foil opening system.
- Fire resistance.
- Seismic certification.
- Wet concrete and flooded hole.
- Chemical resistance.
- Post-installed rebar.
- Cracked concrete.
- Styrene free.
- Overhead installation.
- Quick setting and curing times.
- The tube is reusable, it is enough to change the mixer.
- Suitable when base material temperature is between $-10\text{ }^{\circ}\text{C}$ and $+40\text{ }^{\circ}\text{C}$.

Certification


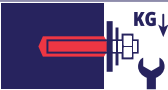
| | | |
|--|--|--|
|   | 09-1488 DoP n°: 09/0140 ETA-09/0140 EAD 330499-01-0601 OPTION 7 M8-M30/Ø 8-Ø32 OPTION 1 M10-M20 C1: M12-M20 C2: M12-M16 | 09-1488 CoP n°: 09/0246 ETA-09/0246 EAD 330087-00-0601 Ø 8-Ø32 Fire Ø 8-Ø32 |
| | | |



SEISMIC
C1: M12 - M20
C2: M12 - M16
REBAR Ø12 - Ø32



FIRE RESISTANCE
R240
REBAR Ø8 - Ø32

Setting times

| Installation temperature |  |  |
|--------------------------|---|---|
| 40 °C | 1 min. | 20 min. |
| 35 °C | 2 min. | 25 min. |
| 30 °C | 3 min. | 30 min. |
| 25 °C | 5 min. | 35 min. |
| 20 °C | 7,5 min. | 40 min. |
| 15 °C | 11,5 min. | 45 min. |
| 10 °C | 16 min. | 1 hour |
| 5 °C | 25 min. | 1 h 30 min. |
| 0 °C | 45 min. | 7 hours |
| -5 °C * | 65 min. | 14 hours |
| -10 °C * | 1 h 45 min. | 24 hours |
| | in H ₂ O 2× curing time | |

Minimum product temperature for application is $+5\text{ }^{\circ}\text{C}$.

Number of fixings

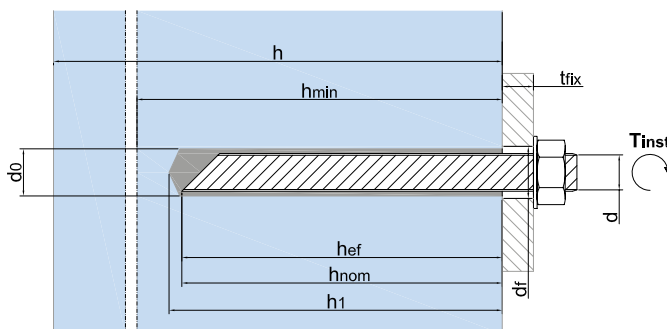
| | Rod diameter | Hole diameter | Effective anchorage depth | 300 ml | 400 ml |
|---|---------------------|----------------------|----------------------------------|--------------------------------|---------------|
| | d [mm] | d ₀ [mm] | h _{ef} [mm] | Numebr of fixing per cartridge | |
| Fixings in solid materials | | | | | |
|  | M 8 | 10 | 80 | ± 57,0 | ± 75,5 |
| | M 10 | 12 | 90 | ± 38,5 | ± 51,5 |
| | M 12 | 14 | 110 | ± 25,5 | ± 34,0 |
| | M 14 | 16 | 115 | ± 20,0 | ± 26,5 |
| | M 16 | 18 | 125 | ± 16,0 | ± 21,0 |
| | M 18 | 20 | 150 | ± 11,0 | ± 14,5 |
| | M 20 | 24 | 170 | ± 5,5 | ± 7,5 |
| | M 22 | 26 | 190 | ± 4,5 | ± 6,0 |
| | M 24 | 28 | 210 | ± 3,5 | ± 5,0 |
| | M 27 | 30 | 240 | ± 3,5 | ± 4,5 |
| | M 30 | 35 | 270 | ± 2,0 | ± 2,5 |
| | M 33 | 37 | 300 | ± 2,0 | ± 2,5 |
| | M 36 | 40 | 330 | ± 1,5 | ± 2,0 |
| | M 39 | 42 | 360 | ± 1,5 | ± 2,0 |
| Fixings in solid materials | | | | | |
|  | ∅ 8 | 12 | 80 | ± 35,0 | ± 47,0 |
| | ∅ 10 | 14 | 100 | ± 23,5 | ± 31,0 |
| | ∅ 12 | 16 | 120 | ± 16,5 | ± 22,5 |
| | ∅ 14 | 18 | 140 | ± 12,5 | ± 16,5 |
| | ∅ 16 | 20 | 160 | ± 9,5 | ± 13,0 |
| | ∅ 18 | 22 | 180 | ± 7,5 | ± 10,0 |
| | ∅ 20 | 25 | 200 | ± 5,0 | ± 6,5 |
| | ∅ 22 | 26 | 220 | ± 5,0 | ± 7,0 |
| | ∅ 24 | 28 | 240 | ± 4,5 | ± 6,0 |
| | ∅ 25 | 30 | 250 | ± 3,0 | ± 4,5 |
| | ∅ 26 | 32 | 260 | ± 2,5 | ± 3,5 |
| | ∅ 28 | 35 | 280 | ± 2,0 | ± 2,5 |
| | ∅ 30 | 35 | 300 | ± 2,5 | ± 3,0 |
| | ∅ 32 | 40 | 320 | ± 1,5 | ± 1,5 |

| Fixings in hollow materials | | | | | |
|-----------------------------|------|----|-----|--------|--------|
| | M 8 | 12 | 50 | ± 42,5 | ± 56,5 |
| | M 8 | 12 | 60 | ± 35,5 | ± 47,0 |
| | M 8 | 12 | 80 | ± 26,5 | ± 35,5 |
| | M 10 | 15 | 85 | ± 16,0 | ± 21,5 |
| | M 10 | 15 | 100 | ± 13,5 | ± 18,0 |
| | M 10 | 15 | 135 | ± 10,0 | ± 13,5 |
| | M 10 | 15 | 140 | ± 9,5 | ± 13,0 |
| | M 12 | 20 | 85 | ± 9,0 | ± 12,0 |
| | M 14 | 20 | 130 | ± 6,0 | ± 8,0 |
| | M 16 | 22 | 150 | ± 4,0 | ± 5,5 |
| | M 16 | 22 | 200 | ± 3,0 | ± 4,0 |
| | M 20 | 30 | 250 | ± 1,5 | ± 2,0 |

WARNING: The number of fixings above mentioned has been calculated according to the theoretical volume needed to fill the hole (or sleeve) excluded the volume of the inserted metal rod. In the theoretical volume it is included a standard extra quantity but the real quantity of the product may be different than it in function of the real application of the product.

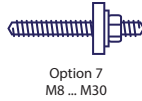
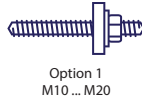
Installation data

| Legend | | | |
|----------------|------------------------------------|-----------------|---|
| | Material | S_{cr} [mm] | Characteristic spacing |
| d [mm] | Rod diameter | C_{cr} [mm] | Characteristic edge distance |
| | Type of rod | S_{min} [mm] | Minimum allowable spacing |
| h_{min} [mm] | Minimum thickness of base material | C_{min} [mm] | Minimum allowable edge distance |
| d_0 [mm] | Hole diameter | t_{fix} [mm] | Fixture thickness |
| h_1 [mm] | Hole depth | d_f [mm] | Diameter of clearance hole in the fixture |
| h_{nom} [mm] | Embedment depth | S_w [mm] | Key |
| h_{ef} [mm] | Effective anchorage depth | T_{inst} [Nm] | Installation torque |



Warning: Before use see this section and the complete procedure of installation reported in the next pages. We assume no liability for the not correct use of the product.

TECHNICAL DATA SHEET



| Material | Rod diameter | Type of rod | Min. thickness base material | | | Hole diameter | Hole depth | | | Embedment depth | | | Effective anchorage depth | | | Characteristic spacing | | | Characteristic edge distance | | | |
|-----------------------------------|--------------------|--------------------|------------------------------|-----|-----|---------------|------------|------------|-----|-----------------|----------------|-----|---------------------------|---------------|-----|------------------------|-----------------|-----|------------------------------|-----------------|-----|-----|
| | | | h_{min} [mm] | | | | d_0 [mm] | h_1 [mm] | | | h_{nom} [mm] | | | h_{ef} [mm] | | | $S_{cr,N}$ [mm] | | | $C_{cr,N}$ [mm] | | |
| | | | min | med | max | | | min | med | max | min | med | max | min | med | max | min | med | max | min | med | max |
| M8-M30 Non cracked concrete | M8 | $\geq 5.8 - A4/70$ | 100 | 110 | 190 | 10 | 65 | 85 | 165 | 60 | 80 | 160 | 60 | 80 | 160 | 180 | 230 | 230 | 90 | 115 | 115 | |
| | M10 | $\geq 5.8 - A4/70$ | 100 | 120 | 230 | 12 | 75 | 95 | 205 | 70 | 90 | 200 | 70 | 90 | 200 | 210 | 248 | 248 | 105 | 124 | 124 | |
| | M12 | $\geq 5.8 - A4/70$ | 110 | 140 | 270 | 14 | 85 | 115 | 245 | 80 | 110 | 240 | 80 | 110 | 240 | 240 | 297 | 297 | 120 | 149 | 149 | |
| M10-M20 Cracked concrete | M16 | $\geq 5.8 - A4/70$ | 136 | 161 | 356 | 18 | 105 | 130 | 325 | 100 | 125 | 320 | 100 | 125 | 320 | 300 | 375 | 396 | 150 | 188 | 198 | |
| | M20 | $\geq 5.8 - A4/70$ | 168 | 218 | 448 | 24 | 125 | 175 | 405 | 120 | 170 | 400 | 120 | 170 | 400 | 360 | 450 | 450 | 180 | 225 | 225 | |
| | M24 | $\geq 5.8 - A4/70$ | 201 | 266 | 536 | 28 | 150 | 215 | 485 | 145 | 210 | 480 | 145 | 210 | 480 | 435 | 540 | 540 | 218 | 270 | 270 | |
| | M27 | $\geq 5.8 - A4/70$ | 205 | 300 | 600 | 30 | 150 | 245 | 545 | 145 | 240 | 540 | 145 | 240 | 540 | 435 | 624 | 624 | 218 | 312 | 312 | |
| M30 | $\geq 5.8 - A4/70$ | 215 | 340 | 670 | 35 | 150 | 275 | 605 | 145 | 270 | 600 | 145 | 270 | 600 | 435 | 693 | 693 | 218 | 346 | 346 | | |

| Material | Rod diameter | Type of rod | Min. allowable spacing | Min. allowable edge distance | Fixture thickness | Diameter of clearance hole in the fixture | Key | Installation torque | | | | | | |
|-----------------------------------|----------------------|----------------------|------------------------|------------------------------|-------------------|---|-----|---------------------|----------------|----------------|---------------|------------|------------|-----------------|
| | | | | | | | | | S_{min} [mm] | C_{min} [mm] | t_{fx} [mm] | d_f [mm] | S_w [mm] | T_{inst} [Nm] |
| | | | | | | | | | | | min÷max | | | |
| M8-M30 Non cracked concrete | M8 | $\geq 5.8 - A4 - 70$ | 40 | 40 | 0 ÷ 1500 | 9 | 13 | 10 | | | | | | |
| | M10 | $\geq 5.8 - A4 - 70$ | 50 | 50 | 0 ÷ 1500 | 12 | 17 | 20 | | | | | | |
| | M12 | $\geq 5.8 - A4 - 70$ | 60 | 60 | 0 ÷ 1500 | 14 | 19 | 40 | | | | | | |
| M10-M20 Cracked Concrete | M16 | $\geq 5.8 - A4 - 70$ | 75 | 75 | 0 ÷ 1500 | 18 | 24 | 80 | | | | | | |
| | M20 | $\geq 5.8 - A4 - 70$ | 100 | 100 | 0 ÷ 1500 | 22 | 30 | 130 | | | | | | |
| | M24 | $\geq 5.8 - A4 - 70$ | 115 | 115 | 0 ÷ 1500 | 26 | 36 | 200 | | | | | | |
| | M27 | $\geq 5.8 - A4 - 70$ | 120 | 120 | 0 ÷ 1500 | 29 | 41 | 250 | | | | | | |
| M30 | $\geq 5.8 - A4 - 70$ | 140 | 140 | 0 ÷ 1500 | 33 | 46 | 280 | | | | | | | |

To avoid splitting failure, the thickness of the concrete member shall be $h \geq 2h_{ef}$

TECHNICAL DATA SHEET

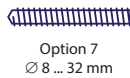


| Material | Rod diameter d [mm] | Type of rod | Hole diameter d _o [mm] | Anchorage length | | | Min. allowable spacing | Min. allowable edge distance | | |
|--------------------|------------------------|-------------|--------------------------------------|---------------------|--------------------|--------------------|------------------------|------------------------------|--------------------|--------------------|
| | | | | l _v [mm] | | | S _{min} [mm] | C _{min} [mm] | | |
| | | | | MIN l _b | MIN l _o | MAX l _b | | MIN l _b | MIN l _o | MAX l _b |
| C20/25 Concrete | Ø 8 | Rebar (*) | 10** - 12 | 115 | 200 | 400 | 40 | 37 | 42 | 54 |
| | Ø 10 | Rebar (*) | 12** - 14 | 145 | 200 | 500 | 40 | 39 | 42 | 60 |
| | Ø 12 | Rebar (*) | 14** - 16 | 170 | 200 | 600 | 48 | 40 | 42 | 66 |
| | Ø 14 | Rebar (*) | 18 | 200 | 210 | 700 | 56 | 42 | 43 | 72 |
| | Ø 16 | Rebar (*) | 20 | 230 | 240 | 800 | 64 | 44 | 45 | 78 |
| | Ø 20 | Rebar (*) | 25 | 285 | 300 | 1000 | 80 | 47 | 48 | 90 |
| | Ø 22 | Rebar (*) | 26 | 315 | 330 | 1000 | 88 | 49 | 50 | 90 |
| | Ø 24 | Rebar (*) | 30 | 340 | 360 | 1000 | 96 | 51 | 52 | 90 |
| | Ø 25 | Rebar (*) | 30 | 355 | 375 | 1000 | 100 | 61 | 63 | 100 |
| | Ø 28 | Rebar (*) | 35 | 400 | 420 | 1000 | 112 | 64 | 65 | 100 |
| | Ø 30 | Rebar (*) | 35 | 425 | 450 | 1000 | 120 | 66 | 67 | 100 |
| Ø 32 | Rebar (*) | 40 | 455 | 480 | 1000 | 128 | 67 | 69 | 100 | |

(*) Rebar = FeB44k; B450C; BST 500

(**) Perforation with reduced hole is suggested for setting depth up to 250 mm

(°) Anchorage lengths according to EC2 and TR023. l_b = anchorage length l_o = overlap joint length



| Material | Rod diameter d [mm] | Type of rod | Min. thickness base material | | | Hole diameter d _o [mm] | Hole depth | | | Embedment depth | | | Effective anchorage depth | | | Characteristic spacing | | | Characteristic edge distance | | | Min. allowable spacing S _{min} [mm] | Min. allowable edge distance C _{min} [mm] |
|-------------------------|------------------------|-------------|------------------------------|-----|-----|--------------------------------------|---------------------|-----|-----|-----------------------|-----|-----|---------------------------|-----|-----|------------------------|------|------|------------------------------|-----|-----|---|---|
| | | | h _{min} [mm] | | | | h ₁ [mm] | | | h _{nom} [mm] | | | h _{ef} [mm] | | | S _{cr} [mm] | | | C _{cr} [mm] | | | | |
| | | | min | med | max | | min | med | max | min | med | max | min | med | max | min | med | max | min | med | max | | |
| Non cracked concrete | Ø 8 | Rebar (*) | 100 | 110 | 190 | 10** - 12 | 65 | 85 | 165 | 60 | 80 | 160 | 60 | 80 | 160 | 180 | 240 | 480 | 90 | 120 | 240 | 50 | 50 |
| | Ø 10 | Rebar (*) | 100 | 120 | 230 | 12** - 14 | 65 | 95 | 205 | 70 | 90 | 200 | 70 | 90 | 200 | 210 | 270 | 600 | 105 | 135 | 300 | 60 | 60 |
| | Ø 12 | Rebar (*) | 112 | 142 | 275 | 14** - 16 | 75 | 115 | 245 | 80 | 110 | 240 | 80 | 110 | 240 | 240 | 330 | 720 | 120 | 165 | 360 | 65 | 65 |
| | Ø 14 | Rebar (*) | 116 | 161 | 316 | 18 | 85 | 130 | 285 | 80 | 125 | 280 | 80 | 125 | 280 | 240 | 375 | 840 | 120 | 188 | 420 | 75 | 75 |
| | Ø 16 | Rebar (*) | 140 | 180 | 360 | 20 | 85 | 145 | 325 | 100 | 140 | 320 | 100 | 140 | 320 | 300 | 420 | 960 | 150 | 210 | 480 | 80 | 80 |
| | Ø 20 | Rebar (*) | 170 | 220 | 450 | 25 | 95 | 175 | 405 | 120 | 170 | 400 | 120 | 170 | 400 | 360 | 510 | 1200 | 180 | 255 | 600 | 100 | 100 |
| | Ø 25 | Rebar (*) | 210 | 270 | 560 | 30 | 105 | 215 | 505 | 150 | 210 | 500 | 150 | 210 | 500 | 450 | 630 | 1500 | 225 | 315 | 750 | 120 | 120 |
| | Ø 28 | Rebar (*) | 250 | 340 | 630 | 35 | 117 | 275 | 565 | 180 | 270 | 560 | 180 | 270 | 560 | 540 | 810 | 1860 | 270 | 405 | 840 | 140 | 140 |
| Ø 32 | Rebar (*) | 280 | 380 | 720 | 40 | 133 | 305 | 645 | 200 | 300 | 640 | 200 | 300 | 640 | 600 | 900 | 1920 | 300 | 450 | 960 | 160 | 160 | |

(*) Rebar = B450C; BST 500

(**) Perforation with reduced hole is suggested for setting depth up to 250 mm

Installation parameters suitable for application according to the anchors theory

TECHNICAL DATA SHEET

| Material | Rod diameter | Type of rod | Min. thickness base material | Hole diameter | Hole depth | Embedment depth | Effective anchorage depth | Characteristic spacing | Characteristic edge distance | Min. allowable spacing | Min. allowable edge distance | Max. fixture thickness | Diameter of clearance hole in the fixture | Key | Installation torque |
|-------------|--------------|------------------------------|------------------------------|---------------|------------|-----------------|---------------------------|------------------------|------------------------------|------------------------|------------------------------|------------------------|---|------------|---------------------|
| | d [mm] | | h_{min} [mm] | d_o [mm] | h_1 [mm] | h_{nom} [mm] | h_{ef} [mm] | S_{cr} [mm] | C_{cr} [mm] | S_{min} [mm] | C_{min} [mm] | t_{fx} [mm] | d_f [mm] | S_w [mm] | T_{inst} [Nm] |
| Solid brick | M 8 | ≥ 4.6 A2-70 A4-70 | 200 | 10 | 85 | 80 | 80 | 160 | 200 | 100 | 100 | 10 | 9 | 13 | 7 |
| | M 10 | ≥ 4.6 A2-70 A4-70 | 250 | 12 | 90 | 85 | 85 | 200 | 200 | 100 | 100 | 20 | 12 | 17 | 15 |
| | M 12 | ≥ 4.6 A2-70 A4-70 | 300 | 14 | 100 | 95 | 95 | 240 | 200 | 100 | 100 | 30 | 14 | 19 | 25 |
| | M 16 | ≥ 4.6 A2-70 A4-70 | 350 | 18 | 130 | 125 | 125 | 320 | 200 | 100 | 100 | 35 | 18 | 24 | 30 |

| Material | Rod diameter | Type of rod | Plastic sleeve | Min. thickness base material | Hole diameter | Hole depth | Embedment depth | Effective anchorage depth | Characteristic spacing | Characteristic edge distance | Min. allowable spacing | Min. allowable edge distance | Fixture thickness | Diameter of clearance hole in the fixture | Key | Installation torque |
|--------------|--------------|------------------------------|----------------|------------------------------|---------------|------------|-----------------|---------------------------|------------------------|------------------------------|------------------------|------------------------------|-------------------|---|------------|---------------------|
| | d [mm] | | (*) | h_{min} [mm] | d_o [mm] | h_1 [mm] | h_{nom} [mm] | h_{ef} [mm] | S_{cr} [mm] | C_{cr} [mm] | S_{min} [mm] | C_{min} [mm] | t_{fx} [mm] | d_f [mm] | S_w [mm] | T_{inst} [Nm] |
| Hollow brick | M 8 | ≥ 4.6 A2-70 A4-70 | GC 12×80 | 100 | 12 | 85 | 80 | 80 | $l_{unit,max}$ | $0.5 \times l_{unit,max}$ | 100 | 100 | 10 | 9 | 13 | 3 |
| | M 10 | ≥ 4.6 A2-70 A4-70 | GC 15×85 | 100 | 16 | 90 | 85 | 85 | $l_{unit,max}$ | $0.5 \times l_{unit,max}$ | 100 | 100 | 20 | 12 | 17 | 4 |
| | M 12 | ≥ 4.6 A2-70 A4-70 | GC 20×85 | 100 | 20 | 90 | 85 | 85 | $l_{unit,max}$ | $0.5 \times l_{unit,max}$ | 120 | 120 | 30 | 14 | 19 | 6 |

(*) Other lengths available

$l_{unit,max}$ = Max length of masonry unit

| Material | Rod diameter | Type of rod | Min. thickness base material | Hole diameter | Hole depth | Embedment depth | Effective anchorage depth | Characteristic spacing | Characteristic edge distance | Min. allowable spacing | Min. allowable edge distance | Fixture thickness | Diameter of clearance hole in the fixture | Key | Installation torque |
|------------------|--------------|------------------------------|------------------------------|---------------|------------|-----------------|---------------------------|------------------------|------------------------------|------------------------|------------------------------|-------------------|---|------------|---------------------|
| | d [mm] | | h_{min} [mm] | d_o [mm] | h_1 [mm] | h_{nom} [mm] | h_{ef} [mm] | S_{cr} [mm] | C_{cr} [mm] | S_{min} [mm] | C_{min} [mm] | t_{fx} [mm] | d_f [mm] | S_w [mm] | T_{inst} [Nm] |
| Laminated timber | M 8 | ≥ 4.6 A2-70 A4-70 | 160 | 10 | 85 | 80 | 80 | 100 | 80 | 50 | 50 | 10 | 9 | 13 | 7 |
| | M 10 | ≥ 4.6 A2-70 A4-70 | 200 | 12 | 105 | 100 | 100 | 125 | 100 | 50 | 50 | 20 | 12 | 17 | 15 |
| | M 12 | ≥ 4.6 A2-70 A4-70 | 240 | 14 | 125 | 120 | 120 | 150 | 120 | 60 | 60 | 30 | 14 | 19 | 25 |
| | M 16 | ≥ 4.6 A2-70 A4-70 | 320 | 18 | 165 | 160 | 160 | 200 | 160 | 80 | 80 | 35 | 18 | 24 | 30 |

TECHNICAL DATA SHEET

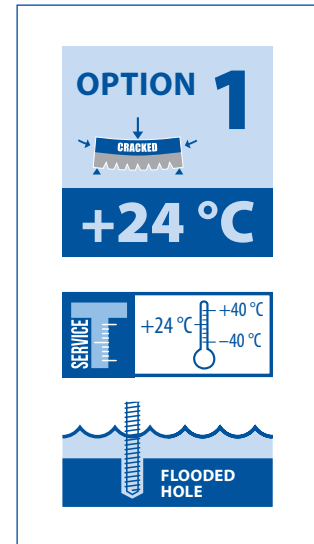
Load data

| Legend | |
|----------------|-------------------------------|
| N_{Rum} [kN] | Average ultimate tension load |
| V_{Rum} [kN] | Average ultimate shear load |
| N_{RK} [kN] | Characteristic tension load |
| V_{RK} [kN] | Characteristic shear load |
| N_{rec} [kN] | Admissible tensile load |
| V_{rec} [kN] | Admissible shear load |

Loads for single anchor with no influence of spacing and edge distance and with $h \geq 2h_{ef}$ $> 1 \text{ kN} = 100 \text{ Kg}$
 $> \psi_{sus} = 1,0$

Shear directed away from the edge General safety factor included Load increasing safety coefficient used = 1,4

With flooded hole, reduction of the recommended load of 20%



Load data with MINIMUM effective anchorage depth

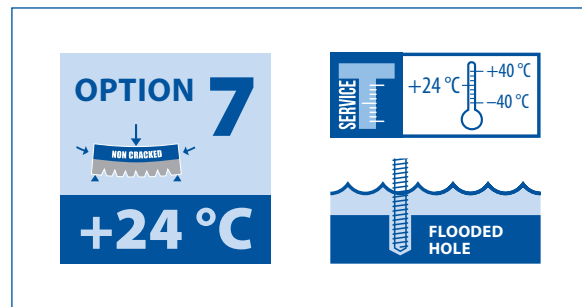
| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|------------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| C20/25 Cracked concrete | | d [mm] | $h_{ef MIN}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{RK} [kN] | V_{RK} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | ≥ 5.8 | M 10 | 70 | 27,8 | 18,1 | 19,1 | 15,1 | 9,1 | 8,6 |
| | ≥ 5.8 | M 12 | 80 | 33,9 | 26,3 | 25,8 | 21,9 | 12,2 | 12,5 |
| | ≥ 5.8 | M 16 | 100 | 47,5 | 48,9 | 36,0 | 40,8 | 17,1 | 23,3 |
| | ≥ 5.8 | M 20 | 120 | 62,4 | 76,2 | 47,3 | 63,5 | 22,5 | 34,3 |

Load data with MEDIUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|------------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| C20/25 Cracked concrete | | d [mm] | $h_{ef MED}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{RK} [kN] | V_{RK} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | ≥ 5.8 | M 10 | 90 | 30,2 | 18,1 | 24,6 | 15,1 | 11,7 | 8,6 |
| | ≥ 5.8 | M 12 | 110 | 43,8 | 26,3 | 37,5 | 21,9 | 17,8 | 12,5 |
| | ≥ 5.8 | M 16 | 125 | 66,3 | 48,9 | 50,3 | 40,8 | 23,9 | 23,3 |
| | ≥ 5.8 | M 20 | 170 | 104,4 | 76,2 | 71,0 | 63,5 | 33,8 | 36,2 |

Load data with MAXIMUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|-----|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| C20/25 Cracked concrete | | d [mm] | $h_{ef MAX}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{RK} [kN] | V_{RK} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | 8.8 | M 10 | 200 | 46,4 | 27,8 | 46,4 | 23,2 | 22,1 | 13,2 |
| | 8.8 | M 12 | 240 | 67,4 | 40,4 | 67,4 | 33,7 | 32,1 | 19,2 |
| | 8.8 | M 16 | 320 | 125,0 | 75,0 | 125,0 | 62,5 | 59,5 | 35,7 |
| | 8.8 | M 20 | 400 | 203,0 | 121,8 | 167,0 | 101,5 | 79,5 | 58,0 |


Load data with MINIMUM effective anchorage depth

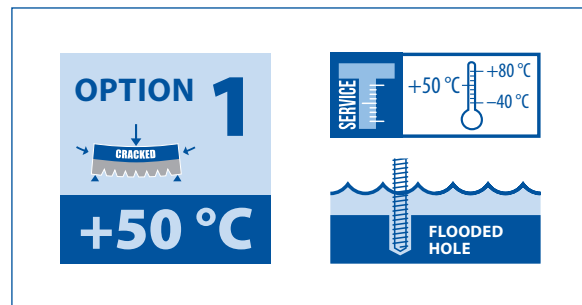
| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|------------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | h_{efMIN} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked Concrete | ≥ 5.8 | M 8 | 60 | 19,0 | 11,4 | 19,0 | 9,5 | 9,0 | 5,4 |
| | ≥ 5.8 | M 10 | 70 | 30,2 | 18,1 | 25,2 | 15,1 | 12,0 | 8,6 |
| | ≥ 5.8 | M 12 | 80 | 43,8 | 26,3 | 35,7 | 21,9 | 17,0 | 12,5 |
| | ≥ 5.8 | M 16 | 100 | 67,5 | 48,9 | 50,5 | 40,8 | 24,0 | 23,3 |
| | ≥ 5.8 | M 20 | 120 | 88,7 | 76,2 | 66,3 | 63,5 | 31,6 | 36,3 |
| | ≥ 5.8 | M 24 | 145 | 117,8 | 110,4 | 88,1 | 92,0 | 41,9 | 52,5 |
| | ≥ 5.8 | M 27 | 145 | 117,8 | 143,4 | 88,1 | 119,5 | 42,0 | 68,2 |
| | ≥ 5.8 | M 30 | 145 | 117,8 | 175,2 | 88,1 | 146,0 | 42,0 | 83,4 |

Load data with MEDIUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|------------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | h_{efMED} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked Concrete | ≥ 5.8 | M 8 | 80 | 19,0 | 11,4 | 19,0 | 9,5 | 9,0 | 5,4 |
| | ≥ 5.8 | M 10 | 90 | 30,2 | 18,1 | 30,2 | 15,1 | 14,3 | 8,6 |
| | ≥ 5.8 | M 12 | 110 | 43,8 | 26,3 | 43,8 | 21,9 | 20,8 | 12,5 |
| | ≥ 5.8 | M 16 | 125 | 81,6 | 48,9 | 70,5 | 40,8 | 33,6 | 23,3 |
| | ≥ 5.8 | M 20 | 170 | 127,0 | 76,2 | 104,7 | 63,5 | 49,8 | 36,3 |
| | ≥ 5.8 | M 24 | 210 | 184,0 | 110,4 | 153,2 | 92,0 | 72,9 | 52,5 |
| | ≥ 5.8 | M 27 | 240 | 221,3 | 143,4 | 168,6 | 119,5 | 80,3 | 68,2 |
| | ≥ 5.8 | M 30 | 270 | 271,8 | 175,2 | 208,4 | 146,0 | 99,2 | 83,4 |

Load data with MAXIMUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|-----|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | h_{efMAX} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | 8.8 | M 8 | 160 | 29,2 | 17,5 | 29,2 | 14,6 | 13,9 | 8,3 |
| | 8.8 | M 10 | 200 | 46,4 | 27,8 | 46,4 | 23,2 | 22,1 | 13,2 |
| | 8.8 | M 12 | 240 | 67,4 | 40,4 | 67,4 | 33,7 | 32,1 | 19,2 |
| | 8.8 | M 16 | 320 | 125,0 | 75,0 | 125,0 | 62,5 | 59,5 | 35,7 |
| | 8.8 | M 20 | 400 | 203,0 | 121,8 | 203,0 | 101,5 | 96,6 | 58,0 |
| | 8.8 | M 24 | 480 | 293,0 | 175,8 | 293,0 | 146,5 | 139,5 | 83,7 |
| | 8.8 | M 27 | 540 | 381,0 | 228,6 | 379,2 | 190,5 | 180,6 | 108,8 |
| | 8.8 | M 30 | 600 | 466,0 | 279,6 | 463,1 | 233,0 | 220,5 | 133,1 |


Load data with MINIMUM effective anchorage depth

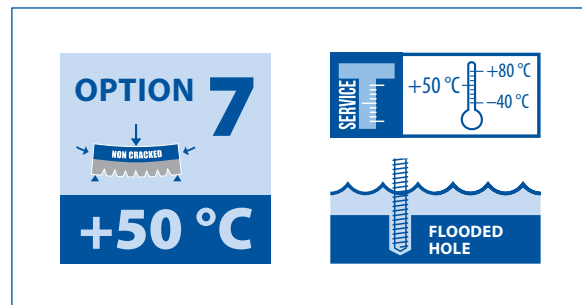
| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate Shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|------------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | $h_{ef\ MIN}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Cracked concrete | ≥ 5.8 | M 10 | 70 | 27,8 | 18,1 | 13,8 | 15,1 | 6,5 | 8,6 |
| | ≥ 5.8 | M 12 | 80 | 33,9 | 26,3 | 19,6 | 21,9 | 9,3 | 12,5 |
| | ≥ 5.8 | M 16 | 100 | 47,5 | 48,9 | 29,5 | 40,8 | 14,0 | 23,3 |
| | ≥ 5.8 | M 20 | 120 | 62,4 | 76,2 | 36,0 | 63,5 | 17,1 | 34,3 |

Load data with MEDIUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate Shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|------------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | $h_{ef\ MED}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Cracked concrete | ≥ 5.8 | M 10 | 90 | 30,2 | 18,1 | 17,7 | 15,1 | 8,4 | 8,6 |
| | ≥ 5.8 | M 12 | 110 | 43,8 | 26,3 | 27,0 | 21,9 | 12,8 | 12,5 |
| | ≥ 5.8 | M 16 | 125 | 66,3 | 48,9 | 36,9 | 40,8 | 17,6 | 23,3 |
| | ≥ 5.8 | M 20 | 170 | 104,4 | 76,2 | 51,1 | 63,5 | 24,3 | 36,2 |

Load data with MAXIMUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate Shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|-----|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | $h_{ef\ MAX}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Cracked concrete | 8.8 | M 10 | 200 | 46,4 | 27,8 | 39,4 | 23,2 | 18,7 | 13,2 |
| | 8.8 | M 12 | 240 | 67,4 | 40,4 | 58,9 | 33,7 | 28,0 | 19,2 |
| | 8.8 | M 16 | 320 | 125,0 | 75,0 | 94,6 | 62,5 | 45,0 | 35,7 |
| | 8.8 | M 20 | 400 | 203,0 | 121,8 | 120,2 | 101,5 | 57,2 | 58,0 |


Load data with MINIMUM effective anchorage depth

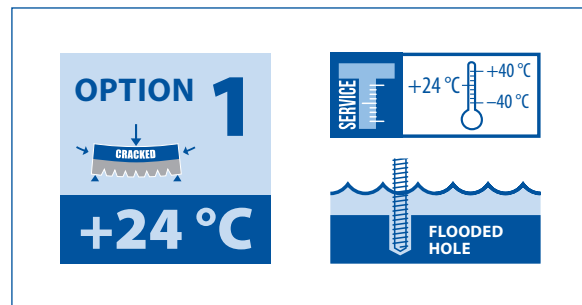
| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|------------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | h_{efMIN} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | ≥ 5.8 | M 8 | 60 | 19,0 | 11,4 | 17,2 | 9,5 | 8,2 | 5,4 |
| | ≥ 5.8 | M 10 | 70 | 30,2 | 18,1 | 18,1 | 15,1 | 8,6 | 8,6 |
| | ≥ 5.8 | M 12 | 80 | 43,8 | 26,3 | 25,7 | 21,9 | 12,2 | 12,5 |
| | ≥ 5.8 | M 16 | 100 | 67,5 | 48,9 | 42,6 | 40,8 | 20,3 | 23,3 |
| | ≥ 5.8 | M 20 | 120 | 88,7 | 76,2 | 53,2 | 63,5 | 25,3 | 36,3 |
| | ≥ 5.8 | M 24 | 145 | 117,8 | 110,4 | 76,1 | 92,0 | 36,2 | 52,5 |
| | ≥ 5.8 | M 27 | 145 | 117,8 | 143,4 | 78,9 | 119,5 | 37,6 | 68,2 |
| | ≥ 5.8 | M 30 | 145 | 117,8 | 175,2 | 86,2 | 146,0 | 41,0 | 83,4 |

Load data with MEDIUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|------------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | h_{efMED} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | ≥ 5.8 | M 8 | 80 | 19,0 | 11,4 | 19,0 | 9,5 | 9,0 | 5,4 |
| | ≥ 5.8 | M 10 | 90 | 30,2 | 18,1 | 23,3 | 15,1 | 11,1 | 8,6 |
| | ≥ 5.8 | M 12 | 110 | 43,8 | 26,3 | 35,4 | 21,9 | 16,8 | 12,5 |
| | ≥ 5.8 | M 16 | 125 | 81,6 | 48,9 | 53,3 | 40,8 | 25,3 | 23,3 |
| | ≥ 5.8 | M 20 | 170 | 127,0 | 76,2 | 75,3 | 63,5 | 35,9 | 36,3 |
| | ≥ 5.8 | M 24 | 210 | 184,0 | 110,4 | 110,3 | 92,0 | 52,5 | 52,5 |
| | ≥ 5.8 | M 27 | 240 | 221,3 | 143,4 | 130,6 | 119,5 | 62,3 | 68,2 |
| | ≥ 5.8 | M 30 | 270 | 271,8 | 195,2 | 160,5 | 146,0 | 76,3 | 83,4 |

Load data with MAXIMUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|-----|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | h_{efMAX} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | 8.8 | M 8 | 160 | 29,2 | 17,5 | 29,2 | 14,6 | 13,9 | 8,3 |
| | 8.8 | M 10 | 200 | 46,4 | 27,8 | 46,4 | 23,2 | 22,1 | 13,2 |
| | 8.8 | M 12 | 240 | 67,4 | 40,4 | 67,4 | 33,7 | 32,1 | 19,2 |
| | 8.8 | M 16 | 320 | 125,0 | 75,0 | 125,0 | 62,5 | 59,5 | 35,7 |
| | 8.8 | M 20 | 400 | 203,0 | 121,8 | 177,3 | 101,5 | 84,4 | 58,0 |
| | 8.8 | M 24 | 480 | 293,0 | 175,8 | 252,1 | 146,5 | 120,0 | 83,7 |
| | 8.8 | M 27 | 540 | 381,3 | 228,6 | 293,8 | 190,5 | 139,9 | 108,8 |
| | 8.8 | M 30 | 600 | 466,0 | 279,6 | 356,6 | 233,0 | 169,8 | 133,1 |


Load data with MINIMUM effective anchorage depth

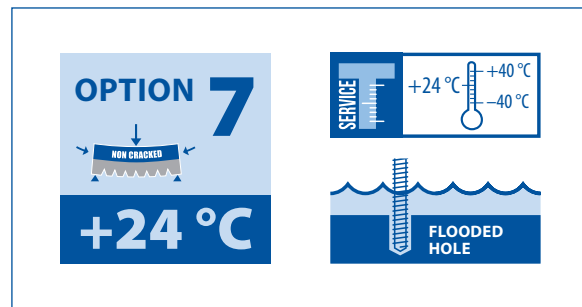
| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | $h_{ef\ MIN}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Cracked concrete | A4-70 | M 10 | 70 | 27,8 | 24,3 | 19,1 | 20,3 | 9,1 | 9,2 |
| | A4-70 | M 12 | 80 | 33,9 | 35,4 | 25,7 | 29,5 | 12,2 | 13,5 |
| | A4-70 | M 16 | 100 | 47,5 | 65,9 | 36,0 | 54,9 | 17,1 | 25,1 |
| | A4-70 | M 20 | 120 | 62,4 | 102,9 | 47,3 | 72,1 | 22,5 | 34,3 |

Load data with MEDIUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | $h_{ef\ MED}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Cracked concrete | A4-70 | M 10 | 90 | 40,5 | 24,3 | 24,6 | 20,3 | 11,7 | 9,2 |
| | A4-70 | M 12 | 110 | 54,8 | 35,4 | 37,5 | 29,5 | 17,8 | 13,5 |
| | A4-70 | M 16 | 125 | 66,3 | 65,9 | 50,3 | 54,9 | 23,9 | 25,1 |
| | A4-70 | M 20 | 170 | 104,4 | 102,9 | 71,0 | 85,7 | 33,8 | 39,2 |

Load data with MAXIMUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | $h_{ef\ MAX}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Cracked concrete | A4-70 | M 10 | 200 | 40,6 | 24,3 | 40,6 | 20,3 | 15,5 | 9,2 |
| | A4-70 | M 12 | 240 | 59,0 | 35,4 | 59,0 | 29,5 | 22,5 | 13,5 |
| | A4-70 | M 16 | 320 | 109,9 | 65,9 | 109,9 | 54,9 | 41,9 | 25,1 |
| | A4-70 | M 20 | 400 | 171,5 | 102,9 | 167,0 | 85,7 | 65,5 | 39,2 |


Load data with MINIMUM effective anchorage depth

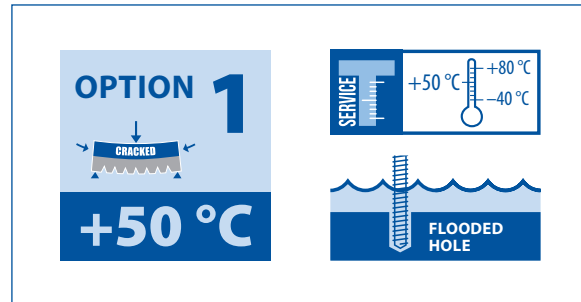
| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | | h_{efMIN} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | | d [mm] | h_{efMIN} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | A4-70 | M 8 | 60 | 25,6 | 15,3 | 23,4 | 12,8 | 9,7 | 5,8 |
| | A4-70 | M 10 | 70 | 37,5 | 24,3 | 25,2 | 20,3 | 12,0 | 9,2 |
| | A4-70 | M 12 | 80 | 45,3 | 35,4 | 35,7 | 29,5 | 17,0 | 13,5 |
| | A4-70 | M 16 | 100 | 67,5 | 65,9 | 50,5 | 54,9 | 24,0 | 25,1 |
| | A4-70 | M 20 | 120 | 88,7 | 102,9 | 66,3 | 85,7 | 31,6 | 39,2 |
| | A4-70 | M 24 | 145 | 117,8 | 148,2 | 88,1 | 123,5 | 41,9 | 56,5 |
| | A4-70 | M 27 | 145 | 117,8 | 160,6 | 88,1 | 160,6 | 41,9 | 73,5 |
| A4-70 | M 30 | 145 | 117,8 | 196,4 | 88,1 | 176,2 | 41,9 | 83,9 | |

Load data with MEDIUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | | h_{efMED} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | | d [mm] | h_{efMED} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | A4-70 | M 8 | 80 | 25,6 | 15,3 | 25,6 | 12,8 | 9,7 | 5,8 |
| | A4-70 | M 10 | 90 | 40,6 | 24,3 | 32,4 | 20,3 | 15,4 | 9,2 |
| | A4-70 | M 12 | 110 | 59,0 | 35,4 | 49,1 | 29,5 | 22,5 | 13,5 |
| | A4-70 | M 16 | 125 | 87,5 | 65,9 | 70,5 | 54,9 | 33,6 | 25,1 |
| | A4-70 | M 20 | 170 | 130,6 | 102,9 | 104,6 | 85,7 | 49,8 | 39,2 |
| | A4-70 | M 24 | 210 | 196,1 | 148,2 | 153,1 | 123,5 | 72,9 | 56,5 |
| | A4-70 | M 27 | 240 | 221,3 | 160,6 | 166,9 | 160,6 | 79,5 | 73,5 |
| A4-70 | M 30 | 270 | 271,7 | 196,3 | 205,0 | 196,3 | 97,6 | 89,9 | |

Load data with MAXIMUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | | h_{efMAX} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | | d [mm] | h_{efMAX} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | A4-70 | M 8 | 160 | 25,6 | 15,3 | 25,6 | 12,8 | 9,7 | 5,8 |
| | A4-70 | M 10 | 200 | 40,6 | 24,3 | 40,6 | 20,3 | 15,5 | 9,2 |
| | A4-70 | M 12 | 240 | 59,0 | 35,4 | 59,0 | 29,5 | 22,5 | 13,5 |
| | A4-70 | M 16 | 320 | 109,9 | 65,9 | 109,9 | 54,9 | 41,9 | 25,1 |
| | A4-70 | M 20 | 400 | 171,5 | 102,9 | 171,5 | 85,7 | 65,5 | 39,2 |
| | A4-70 | M 24 | 480 | 247,1 | 148,2 | 247,1 | 123,5 | 94,3 | 56,5 |
| | A4-70 | M 27 | 540 | 321,3 | 160,6 | 321,3 | 160,6 | 122,7 | 73,5 |
| A4-70 | M 30 | 600 | 392,7 | 235,6 | 392,7 | 196,3 | 150,0 | 89,9 | |


Load data with MINIMUM effective anchorage depth

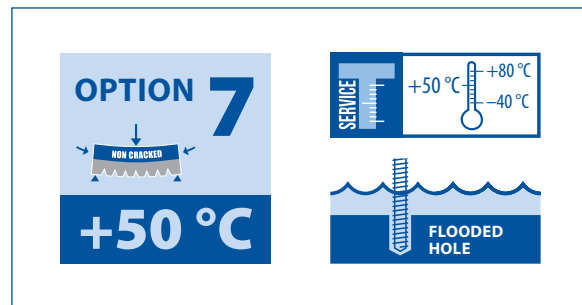
| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | h_{efMIN} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Cracked concrete | A4-70 | M 10 | 70 | 27,8 | 24,3 | 13,8 | 20,3 | 6,5 | 9,2 |
| | A4-70 | M 12 | 80 | 33,9 | 35,4 | 19,6 | 29,5 | 9,3 | 13,5 |
| | A4-70 | M 16 | 100 | 47,5 | 65,9 | 29,5 | 54,9 | 14,0 | 25,1 |
| | A4-70 | M 20 | 120 | 62,4 | 102,9 | 36,0 | 72,1 | 17,1 | 34,3 |

Load data with MEDIUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | h_{efMED} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Cracked concrete | A4-70 | M 10 | 90 | 40,5 | 24,3 | 17,7 | 20,3 | 8,4 | 9,2 |
| | A4-70 | M 12 | 110 | 54,8 | 35,4 | 27,0 | 29,5 | 12,8 | 13,5 |
| | A4-70 | M 16 | 125 | 66,3 | 65,9 | 36,9 | 54,9 | 17,6 | 25,1 |
| | A4-70 | M 20 | 170 | 104,4 | 102,9 | 51,1 | 85,7 | 24,3 | 39,2 |

Load data with MAXIMUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|----------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | d [mm] | h_{efMAX} [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Cracked concrete | A4-70 | M 10 | 200 | 40,6 | 24,3 | 39,4 | 20,3 | 15,5 | 9,2 |
| | A4-70 | M 12 | 240 | 59,0 | 35,4 | 58,9 | 29,5 | 22,5 | 13,5 |
| | A4-70 | M 16 | 320 | 109,9 | 65,9 | 94,6 | 54,9 | 41,9 | 25,1 |
| | A4-70 | M 20 | 400 | 171,5 | 102,9 | 120,2 | 85,7 | 57,2 | 39,2 |


Load data with MINIMUM effective anchorage depth

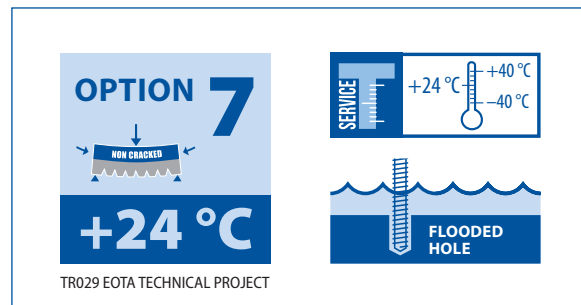
| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | | $h_{ef MIN}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | | d [mm] | $h_{ef MIN}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | A4-70 | M 8 | 60 | 25,6 | 15,3 | 17,2 | 12,8 | 8,2 | 5,8 |
| | A4-70 | M 10 | 70 | 37,5 | 24,3 | 18,1 | 20,3 | 8,6 | 9,2 |
| | A4-70 | M 12 | 80 | 45,3 | 35,4 | 25,7 | 29,5 | 12,2 | 13,5 |
| | A4-70 | M 16 | 100 | 67,5 | 65,9 | 42,6 | 54,9 | 20,3 | 25,1 |
| | A4-70 | M 20 | 120 | 88,7 | 102,9 | 53,2 | 85,7 | 25,3 | 39,2 |
| | A4-70 | M 24 | 145 | 117,8 | 148,2 | 76,1 | 123,5 | 36,2 | 56,5 |
| | A4-70 | M 27 | 145 | 117,8 | 160,6 | 73,3 | 146,6 | 34,9 | 69,8 |
| A4-70 | M 30 | 145 | 117,8 | 196,4 | 80,6 | 161,1 | 38,4 | 76,7 | |

Load data with MEDIUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | | $h_{ef MED}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | | d [mm] | $h_{ef MED}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | A4-70 | M 8 | 80 | 25,6 | 15,3 | 23,0 | 12,8 | 9,7 | 5,8 |
| | A4-70 | M 10 | 90 | 40,6 | 24,3 | 23,3 | 20,3 | 11,1 | 9,2 |
| | A4-70 | M 12 | 110 | 59,0 | 35,4 | 35,4 | 29,5 | 16,8 | 13,5 |
| | A4-70 | M 16 | 125 | 87,5 | 65,9 | 53,3 | 54,9 | 25,3 | 25,1 |
| | A4-70 | M 20 | 170 | 130,6 | 102,9 | 75,3 | 85,7 | 35,8 | 39,2 |
| | A4-70 | M 24 | 210 | 196,1 | 148,2 | 110,3 | 123,5 | 52,5 | 56,5 |
| | A4-70 | M 27 | 240 | 221,3 | 160,6 | 121,3 | 160,6 | 57,7 | 73,5 |
| A4-70 | M 30 | 270 | 271,7 | 196,3 | 150,0 | 196,3 | 71,5 | 89,9 | |

Load data with MAXIMUM effective anchorage depth

| Material | Rod | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--------------------------------|-------|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | | $h_{ef MAX}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete | | d [mm] | $h_{ef MAX}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | A4-70 | M 8 | 160 | 25,6 | 15,3 | 25,6 | 12,8 | 9,7 | 5,8 |
| | A4-70 | M 10 | 200 | 40,6 | 24,3 | 40,6 | 20,3 | 15,5 | 9,2 |
| | A4-70 | M 12 | 240 | 59,0 | 35,4 | 59,0 | 29,5 | 22,5 | 13,5 |
| | A4-70 | M 16 | 320 | 109,9 | 65,9 | 109,9 | 54,9 | 41,9 | 25,1 |
| | A4-70 | M 20 | 400 | 171,5 | 102,9 | 171,5 | 85,7 | 65,5 | 39,2 |
| | A4-70 | M 24 | 480 | 247,1 | 148,2 | 247,1 | 123,5 | 94,3 | 56,5 |
| | A4-70 | M 27 | 540 | 321,3 | 160,6 | 272,9 | 160,6 | 122,7 | 73,5 |
| A4-70 | M 30 | 600 | 392,7 | 235,6 | 333,4 | 196,3 | 150,0 | 89,9 | |


Load data with MINIMUM effective anchorage depth

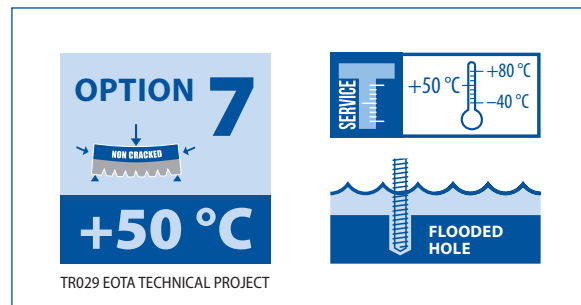
| Material | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | $h_{ef,MIN}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete Rebar B450C BST500 | d [mm] | $h_{ef,MIN}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | Ø 8 | 60 | 24,7 | 16,2 | 21,1 | 13,6 | 10,1 | 7,8 |
| | Ø 10 | 70 | 33,1 | 25,4 | 28,3 | 21,2 | 13,5 | 12,1 |
| | Ø 12 | 80 | 41,0 | 36,6 | 36,1 | 30,5 | 17,2 | 17,4 |
| | Ø 14 | 80 | 46,2 | 49,8 | 36,1 | 41,6 | 17,2 | 23,8 |
| | Ø 16 | 100 | 64,1 | 65,1 | 50,5 | 54,3 | 24,0 | 31,0 |
| | Ø 20 | 120 | 88,7 | 101,0 | 66,4 | 84,8 | 31,6 | 48,5 |
| | Ø 25 | 150 | 124,0 | 159,0 | 92,8 | 132,5 | 44,2 | 75,7 |
| | Ø 28 | 180 | 163,0 | 199,5 | 122,0 | 166,3 | 58,1 | 95,0 |
| Ø 32 | 200 | 185,4 | 260,5 | 142,8 | 217,1 | 68,0 | 124,1 | |

Load data with MEDIUM effective anchorage depth

| Material | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | $h_{ef,MED}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete Rebar B450C BST500 | d [mm] | $h_{ef,MED}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | Ø 8 | 80 | 27,1 | 16,2 | 27,1 | 13,6 | 12,9 | 7,8 |
| | Ø 10 | 90 | 42,4 | 25,4 | 36,3 | 21,2 | 17,3 | 12,1 |
| | Ø 12 | 110 | 56,4 | 36,6 | 52,1 | 30,5 | 24,8 | 17,4 |
| | Ø 14 | 125 | 72,1 | 49,8 | 66,6 | 41,6 | 31,7 | 23,8 |
| | Ø 16 | 140 | 89,8 | 65,1 | 73,8 | 54,3 | 35,1 | 31,0 |
| | Ø 20 | 170 | 126,7 | 101,0 | 104,1 | 84,8 | 49,6 | 48,5 |
| | Ø 25 | 210 | 197,3 | 159,0 | 153,7 | 132,5 | 73,2 | 75,7 |
| | Ø 28 | 270 | 250,3 | 199,5 | 205,7 | 166,3 | 97,9 | 95,0 |
| Ø 32 | 300 | 278,1 | 260,5 | 228,5 | 217,1 | 108,8 | 124,1 | |

Load data with MAXIMUM effective anchorage depth

| Material | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | | $h_{ef,MAX}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete Rebar B450C BST500 | d [mm] | $h_{ef,MAX}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| | Ø 8 | 160 | 27,1 | 16,2 | 27,1 | 13,6 | 12,9 | 7,8 |
| | Ø 10 | 200 | 42,4 | 25,4 | 42,4 | 21,2 | 20,2 | 12,1 |
| | Ø 12 | 240 | 61,1 | 36,6 | 61,1 | 30,5 | 29,1 | 17,4 |
| | Ø 14 | 280 | 83,1 | 49,8 | 83,1 | 41,6 | 39,6 | 23,8 |
| | Ø 16 | 320 | 108,6 | 65,1 | 108,6 | 54,3 | 51,7 | 31,0 |
| | Ø 20 | 400 | 169,6 | 101,0 | 169,6 | 84,8 | 80,8 | 48,5 |
| | Ø 25 | 500 | 265,1 | 159,0 | 265,1 | 132,5 | 126,2 | 75,7 |
| | Ø 28 | 560 | 332,5 | 199,5 | 332,5 | 166,3 | 158,3 | 95,0 |
| Ø 32 | 640 | 434,3 | 260,5 | 434,3 | 217,1 | 206,8 | 124,1 | |



Load data with MINIMUM effective anchorage depth

| Material | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | d [mm] | $h_{ef,MIN}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete Rebar B450C BST500 | ∅ 8 | 60 | 24,7 | 16,2 | 21,1 | 13,6 | 7,2 | 7,8 |
| | ∅ 10 | 70 | 33,1 | 25,4 | 28,3 | 21,2 | 9,7 | 12,1 |
| | ∅ 12 | 80 | 41,0 | 36,6 | 36,1 | 30,5 | 13,0 | 17,4 |
| | ∅ 14 | 80 | 46,2 | 49,8 | 36,1 | 41,6 | 14,6 | 23,8 |
| | ∅ 16 | 100 | 64,1 | 65,1 | 50,5 | 54,3 | 18,1 | 31,0 |
| | ∅ 20 | 120 | 88,7 | 101,0 | 66,4 | 84,8 | 25,2 | 48,5 |
| | ∅ 25 | 150 | 124,0 | 159,0 | 92,8 | 132,5 | 41,3 | 75,7 |
| | ∅ 28 | 180 | 163,0 | 199,5 | 122,0 | 166,3 | 47,2 | 95,0 |
| ∅ 32 | 200 | 185,4 | 260,5 | 142,8 | 217,1 | 52,2 | 124,1 | |

Load data with MEDIUM effective anchorage depth

| Material | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | d [mm] | $h_{ef,MED}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete Rebar B450C BST500 | ∅ 8 | 80 | 27,1 | 16,2 | 27,1 | 13,6 | 9,7 | 7,8 |
| | ∅ 10 | 90 | 42,4 | 25,4 | 36,3 | 21,2 | 12,5 | 12,1 |
| | ∅ 12 | 110 | 56,4 | 36,6 | 52,1 | 30,5 | 17,9 | 17,4 |
| | ∅ 14 | 125 | 72,1 | 49,8 | 66,6 | 41,6 | 20,3 | 23,8 |
| | ∅ 16 | 140 | 89,8 | 65,1 | 73,8 | 54,3 | 25,3 | 31,0 |
| | ∅ 20 | 170 | 126,7 | 101,0 | 104,1 | 84,8 | 35,7 | 48,5 |
| | ∅ 25 | 210 | 197,3 | 159,0 | 153,7 | 132,5 | 57,8 | 75,7 |
| | ∅ 28 | 270 | 250,3 | 199,5 | 205,7 | 166,3 | 70,9 | 95,0 |
| ∅ 32 | 300 | 278,1 | 260,5 | 228,5 | 217,1 | 78,3 | 124,1 | |

Load data with MAXIMUM effective anchorage depth

| Material | Rod diameter | Effective anchorage depth | Ultimate tension load | Ultimate shear load | Characteristic tensile load | Characteristic shear load | Admissible tensile load | Admissible shear load |
|--|--------------|---------------------------|-----------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------|
| | d [mm] | $h_{ef,MAX}$ [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{Rk} [kN] | V_{Rk} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| C20/25 Non cracked concrete Rebar B450C BST500 | ∅ 8 | 160 | 27,1 | 16,2 | 27,1 | 13,6 | 12,9 | 7,8 |
| | ∅ 10 | 200 | 42,4 | 25,4 | 42,4 | 21,2 | 20,2 | 12,1 |
| | ∅ 12 | 240 | 61,1 | 36,6 | 61,1 | 30,5 | 29,1 | 17,4 |
| | ∅ 14 | 280 | 83,1 | 49,8 | 83,1 | 41,6 | 39,6 | 23,8 |
| | ∅ 16 | 320 | 108,6 | 65,1 | 108,6 | 54,3 | 51,7 | 31,0 |
| | ∅ 20 | 400 | 169,6 | 101,0 | 169,6 | 84,8 | 80,8 | 48,5 |
| | ∅ 25 | 500 | 265,1 | 159,0 | 265,1 | 132,5 | 126,2 | 75,7 |
| | ∅ 28 | 560 | 332,5 | 199,5 | 332,5 | 166,3 | 158,3 | 95,0 |
| ∅ 32 | 640 | 434,3 | 260,5 | 434,3 | 217,1 | 206,8 | 124,1 | |

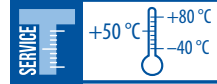
Post-installed rebar connections

Hammer drilled holes



REBAR EC2

+50 °C



| Material | Type of rod | Rod diameter | Bond resistance fbd [N/mm ²] | | | | | | | | |
|---|-------------|--------------|--|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | d [mm] | C 12/15 | C 16/20 | C 20/25 | C 25/30 | C 30/37 | C 35/45 | C 40/50 | C 45/55 |
| Wet and dry concrete (* Rebar = B450C BST 500) | Rebar (*) | ∅ 8 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,7 | 4,0 | 4,3 |
| | Rebar (*) | ∅ 10 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,7 | 4,0 | 4,3 |
| | Rebar (*) | ∅ 12 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,7 | 4,0 | 4,3 |
| | Rebar (*) | ∅ 14 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,7 | 4,0 | 4,3 |
| | Rebar (*) | ∅ 16 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,7 | 4,0 | 4,0 |
| | Rebar (*) | ∅ 20 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,7 | 4,0 | 4,0 |
| | Rebar (*) | ∅ 22 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,7 | 3,7 | 4,0 |
| | Rebar (*) | ∅ 24 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,7 | 3,7 | 3,7 |
| | Rebar (*) | ∅ 25 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,7 | 3,7 | 3,7 |
| | Rebar (*) | ∅ 28 | 1,6 | 2,0 | 2,3 | 2,7 | 3,0 | 3,4 | 3,4 | 3,4 | 3,4 |
| | Rebar (*) | ∅ 30 | 1,6 | 2,0 | 2,3 | 2,7 | 2,7 | 2,7 | 2,7 | 2,7 | 2,7 |
| | Rebar (*) | ∅ 32 | 1,6 | 2,0 | 2,3 | 2,7 | 2,7 | 2,7 | 2,7 | 2,7 | 2,7 |

Design value of bond strength fbd suitable for all anchorage lengths

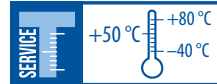
FIXING IN SEISMIC



POST INSTALLED REBAR
EAD 331522-00-0601

REBAR EC8

+50 °C



Hammer drilled holes

| Material | Type of rod | Rod diameter | Bond resistance fbd [N/mm ²] | | | | | | | |
|---|-------------|--------------|--|---------|---------|---------|---------|---------|---------|---------|
| | | | d [mm] | C 16/20 | C 20/25 | C 25/30 | C 30/37 | C 35/45 | C 40/50 | C 45/55 |
| Wet and dry concrete (* Rebar = B450C BST 500) | Rebar (*) | ∅ 12 | 2,0 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| | Rebar (*) | ∅ 14 | 2,0 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| | Rebar (*) | ∅ 16 | 2,0 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| | Rebar (*) | ∅ 20 | 2,0 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| | Rebar (*) | ∅ 22 | 2,0 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| | Rebar (*) | ∅ 24 | 2,0 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| | Rebar (*) | ∅ 25 | 2,0 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| | Rebar (*) | ∅ 28 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 |
| | Rebar (*) | ∅ 30 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 |
| | Rebar (*) | ∅ 32 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 |

Design value of bond strength fbd suitable for all anchorage lengths

Load data solid, hollow masonry and timber

| Material | Type of rod | Rod diameter | Ultimate tension Load | Ultimate shear load | Admissible tensile load | Admissible shear load |
|---|----------------------|--------------|---|---------------------|-------------------------|---|
| | | d [mm] | N_{Rum} [kN] | V_{Rum} [kN] | N_{rec} [kN] | V_{rec} [kN] |
| Solid Brick ≥ 4.6 / A2-70 / A4-70 | ≥ 4.6 A2-70 A4-70 | M8 | Recommended loads for applications on base materials with medium strength characteristics. For different masonry and/or wood base materials, load values must be obtained with in site tests. | | 2,0 | 3,0 |
| | ≥ 4.6 A2-70 A4-70 | M10 | | | 2,6 | 3,4 |
| | ≥ 4.6 A2-70 A4-70 | M12 | | | 2,8 | 3,9 |
| | ≥ 4.6 A2-70 A4-70 | M16 | | | 4,0 | 4,2 |
| Hollow Material ≥ 4.6 / A2-70 / A4-70 | ≥ 4.6 A2-70 A4-70 | M8 | | | 0,9 | 2,0 |
| | ≥ 4.6 A2-70 A4-70 | M10 | | | 0,9 | 2,0 |
| | ≥ 4.6 A2-70 A4-70 | M12 | | | 0,9 | 2,5 |
| Laminated Timber ≥ 4.6 / A2-70 / A4-70 | ≥ 4.6 A2-70 A4-70 | M8 | | | 3,2 | For shear loads refer to CNR-DT 206/2007 (7.10.2.3) |
| | ≥ 4.6 A2-70 A4-70 | M10 | | | 4,2 | |
| | ≥ 4.6 A2-70 A4-70 | M12 | | | 6,1 | |
| | ≥ 4.6 A2-70 A4-70 | M16 | | | 10,7 | |

Installation procedure

Cleaning

Drill the hole and check it's perpendicularity. Blow the hole with an appropriate pump blower (or compression air), clean the lateral surface of the hole with an appropriate steel brush, blow again in the hole until there is no dust and/or any residual material inside. We strongly recommend use of the steel brush to clean hole sides.

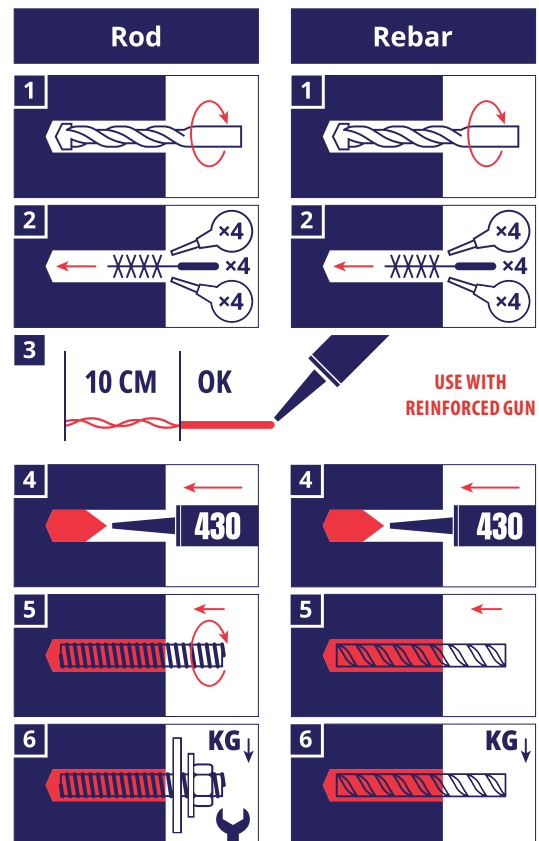
Opening

Unscrew the front cup, pull-out the steel closing clip according to the following operations: 1) Insert the mixer in the eye of the plastic extractor. 2) Pull the extractor to unhook the steel closing clip of the foil. After that, screw on the mixer and insert the cartridge in the gun. Use protections for hands and face.

Cartridge preparation

Use the correct dispenser

Before starting to use the cartridge, eject a first part of the product, being sure that: 1) Through the mixer (transparent) see that the flux of product is compound of the part A (white colour) end of part B (black colour). 2) The two components are completely mixed. The



TECHNICAL DATA SHEET

complete mixing is reached only after that the product, obtained by mixing the two component, comes out from the mixer with an uniform colour. Now the cartridge is ready to be used.

Injection

1) Inject resin into the hole up to fill it 2/3rds. In hollow bricks use the plastic sleeve and inject the resin inside. 2) Before insert the rod, verify that the element is dry and free oil and other contaminants. Insert threaded stud turning back and forth to avoid presence of air in the fitted hole. 3) For the installation and the following anchor load phase, respect the open time and curing time detailed in the technical data sheet and in the label of the product. 4) Before to load the anchor, check the hardened of the product. 5) The cartridge can be used again screwing the cup and replacing the mixer. Remember to eject a first part of the product, see point 3.

WARNING. Installation and loads technical data can be modified by us. For update technical data sheet see www.tegrastate.lt.

Package

300 ml plastic cartridge, 15 cartridges in a box.

Storage and conservation

Guaranteed shelf life – 15 months from the date of manufacture, if stored in closed original packaging in a dry and cool place from +5 °C to +30 °C.