

TECHNICAL DATASHEET

4tec^x (Chemisch anker styreenvrij vinylester 300ml)

4tec^x article number:
4050002700

4050002700



CHARACTERISTICS

- Assessed for all types of concrete, non-cracked, and all concrete applications.
- Assessed studs from M8 to M24.
- Use for high loads.
- Valid for dry, wet and flooded holes.
- Use for static or quasi-static loads.
- Versions in zinc plated steel and stainless steel A2 and A4.
- Temperature range: from -40°C to +80°C (long term maximum temperature +50°C).

CERTIFICATES



APPLICATIONS

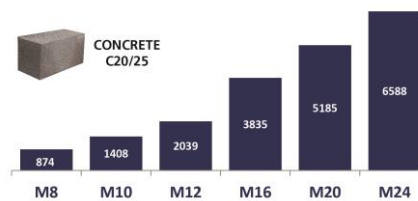
- Use in indoor and outdoor environments.
- Structural applications.
- Fixing roadside fencing.
- Fixing notices, machinery, boilers, signs, billboards, etc.



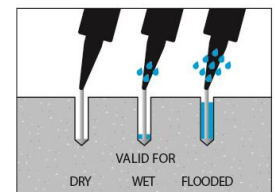
BASE MATERIAL



MAXIMUM LOAD RECOMMENDED [kg]



DRILL HOLE CONDITION



APPLICATION EXAMPLES




VALID FOR

STUD












M8-M24 Stud

1. RANGE



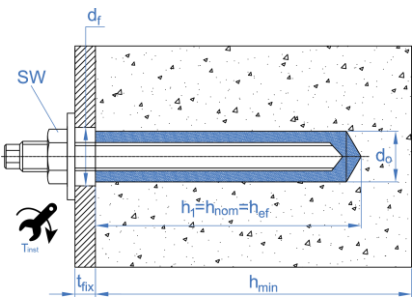
| ITEM | CODE | SIZE | PHOTO | COMOPONENT | MATERIAL | |
|------|------------|---------|---|--------------------|---|----|
| 1 | 4050002700 | 300 ml. |  | VNINYLESTER MORTAR | Vinylester resin Format: cartridge of 300 ml | 12 |

2. ACCESSORIES

| ITEM | CODE | PHOTO | COMPONENT | MATERIAL |
|------|-------------------------|---|-----------------------|--|
| 1 | MOPISSI |  | APPLICATION GUNS | Gun for 300 ml standard cartridges |
| | MOPISTO |  | | Gun for 410 ml coaxial cartridges |
| 2 | EQ-AC EQ-A2 EQ-A4 |  | STUDBOLTS | Threaded steel stud, class 5.8 ISO 898-1 Threaded stainless steel stud A2-70 Threaded stainless steel stud A4-70 |
| 3 | MORCEPKIT |  | CLEANING BRUSHES | 3 Cleaning brushes kit of ø14, ø20 and ø29 mm. |
| 4 | MOBOMBA |  | CLEANING PUMP | Pump for cleaning dust and drill hole fragments |
| 5 | MORCANU |  | MIXING NOZZLE | Plastic. Helix static mixer. |
| 6 | MO-TN |  | NYLON SLEEVE | Plastic. Available in white and grey |
| 7 | MO-TR |  | METAL THREADED SLEEVE | Metal threaded sleeve M8, M10, M12, zinc plated. |
| 8 | MO-TM |  | METAL SLEEVE | Metal sleeve of ø12, ø16 and ø22, |

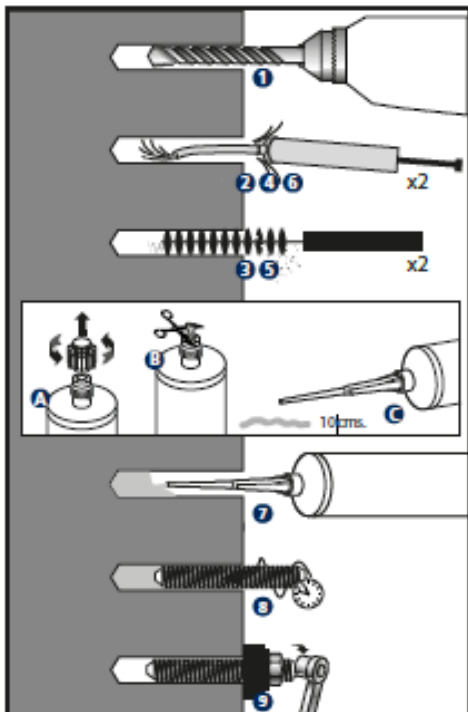
3. INSTALLATION DATA

3.1. CONCRETE FIXING (SET UP PARAMETERS)

| SIZE | | M8 | M10 | M12 | M16 | M20 | M24 |
|--|------|--|------------------------|------------------------|------------------------|------------------------|------------------------|
| d_0 : nominal diameter | [mm] | 10 | 12 | 14 | 18 | 22 | 26 |
| d_f : fixture hole diameter \leq | [mm] | 9 | 12 | 14 | 18 | 22 | 26 |
| T_{ins} : torque \leq | [Nm] | 10 | 20 | 40 | 80 | 150 | 200 |
| Circular cleaning brush diameter | | $\varnothing 14$ | | $\varnothing 20$ | | $\varnothing 29$ | |
| $h_{ef,min} = 8d$ | | | | | | | |
| h_1 : drill hole depth | [mm] | 64 | 80 | 96 | 128 | 160 | 192 |
| $S_{cr,N}$: critical spacing | [mm] | 192 | 240 | 288 | 384 | 480 | 576 |
| $C_{cr,N}$: critical edge distance | [mm] | 96 | 120 | 144 | 192 | 240 | 288 |
| C_{min} : minimum distance to edge | [mm] | 35 | 40 | 50 | 65 | 80 | 96 |
| S_{min} : minimum spacing | [mm] | 35 | 40 | 50 | 65 | 80 | 96 |
| h_{min} : minimum concrete thickness | [mm] | 100 | 110 | 126 | 158 | 204 | 244 |
| Standard Stud | | | | | | | |
| h_1 : drill hole depth | [mm] | 80 | 90 | 110 | 128 | 170 | 210 |
| $S_{cr,N}$: critical spacing | [mm] | 240 | 270 | 330 | 384 | 510 | 630 |
| $C_{cr,N}$: critical edge distance | [mm] | 120 | 135 | 165 | 192 | 255 | 315 |
| C_{min} : minimum distance to edge | [mm] | 43 | 45 | 56 | 65 | 85 | 105 |
| S_{min} : minimum spacing | [mm] | 43 | 45 | 56 | 65 | 85 | 105 |
| h_{min} : minimum concrete thickness | [mm] | 110 | 120 | 140 | 158 | 214 | 262 |
| $h_{ef,max} = 12d$ | | | | | | | |
| h_1 : drill hole depth | [mm] | 96 | 120 | 144 | 192 | 240 | 288 |
| $S_{cr,N}$: critical spacing | [mm] | 288 | 360 | 432 | 576 | 720 | 864 |
| $C_{cr,N}$: critical edge distance | [mm] | 144 | 180 | 216 | 288 | 360 | 432 |
| C_{min} : minimum distance to edge | [mm] | 50 | 60 | 70 | 95 | 120 | 145 |
| S_{min} : minimum spacing | [mm] | 50 | 60 | 70 | 95 | 120 | 145 |
| h_{min} : minimum concrete thickness | [mm] | 126 | 150 | 174 | 222 | 284 | 340 |
|  Zinc plated stud code | | EQAC08110 | EQAC10130 | EQAC12160 | EQAC16190 | EQAC20260 | EQAC24300 |
|  Stainless steel stud code A2 / A4 | | EQA208110 EQA408110 | EQA210130 EQA410130 | EQA212160 EQA412160 | EQA216190 EQA416190 | EQA220260 EQA420260 | EQA224300 EQA424300 |
|  | | <ul style="list-style-type: none"> h_{ef} depth value may be selected by the user ranging between $h_{ef,min} = 8d$ and $h_{ef,max} = 12d$. Any intermediate values may be interpolated. Critical distances are those where anchors in a group of anchors are not influenced by one another with regard to tension load effects. For smaller distances, down to minimum distances, corresponding reduction coefficients must be applied. Standard studs are available for each measurement, as shown in the table. | | | | | |

4. PRODUCT SET UP

4.1. CONCRETE SET UP



1. DRILL

Check the concrete base is compact and porosity is insignificant.
 Suitable for wet, dry or flooded drill holes.
 Cartridge installation temperature: $\geq 5 \text{ }^{\circ}\text{C}$.
 Base material installation temperature: MO-V $\geq +5 \text{ }^{\circ}\text{C}$
 Use drill in hammer mode.
 Drill to the specified diameter and depth values

2 - 6. BLOW AND CLEAN

Clear the drill holes completely of dust and fragments by following the procedure shown in the picture. If the drill hole is flooded, the water must be removed before mortar is injected.

A - B* - C. OPEN CARTRIDGE

Screw the nozzle into the cartridge and place the assembly in the application gun. Squeeze on the trigger repeatedly until the mortar comes out of the nozzle in a uniform grey color. Any iridescence indicates improper mixing. Always discard the first two doses of each cartridge: these are never to be used for fixing. *For 300 ml cartridges, cut end of bag, behind seal clip.

7. INJECT MORTAR

Insert the nozzle to the bottom of the drill hole and apply mortar: gradually remove the nozzle, ensuring there are no air bubbles. Fill the hole to $\frac{1}{2}$ and $\frac{3}{4}$ of its depth.
 In the event of not fully using the cartridge, leave nozzle attached. Only change if using again and handling time has expired, remembering to discard the first two doses of mortar.

8. INSTALLATION

Introduce the stud to be installed by screwing it lightly down to the installation depth value manually; ensuring the mortar covers the stud thread. The introduction of the anchor must take place within the handling time. The mortar must seep from the top of the drill hole to ensure it is completely full and there are no gaps between the stud and the drill hole.

TEMPERATURE AND CURING TIME

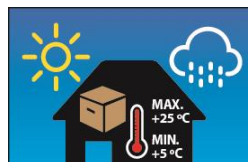
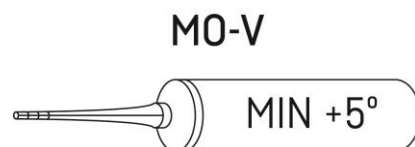
| TYPE | Base material temperature [$^{\circ}\text{C}$] | Handling time [min] | Curing time [min] |
|------------|--|---------------------|-------------------|
| 4050002700 | min +5 | 18 | 120 |
| | +5 to +10 | 12 | 120 |
| | +10 to +20 | 6 | 80 |
| | +20 to +25 | 4 | 40 |
| | +25 to +30 | 3 | 30 |
| | +30 to +35 | 2 | 20 |
| | +35 to +40 | 1.5 | 15 |
| | +40 | 1.5 | 10 |

9. APPLY TORQUE

Once the curing time has elapsed, apply torque, never exceeding the values indicated in the table.

5. STORAGE CONDITIONS

Keep the product stored in a cool, dry place, away from direct sunlight and heat sources, at an average temperature between +5 °C and +25 °C.



Shelf life of unopened cartridge: 18 months from the date of manufacture. The expiration date is indicated on the cartridge.

6. RESISTANCES

6.1 CONCRETE FIXATION

Characteristic resistances for C20/25 concrete for an isolated anchor (without considering anchor-to-anchor or anchor-to-edge distance effects) and class 5.8 studs or A4-70 stainless steel are shown in tables below.

CHARACTERISTIC RESISTANCES

| CONCRETE CLASS | SIZE | | | | M8 | M10 | M12 | M16 | M20 | M24 | |
|--------------------|----------------------|-------------|--------------------|-------------------|----------|-------------|-------------|-------------|-------------|--------------|--------------|
| | NON-CRACKED CONCRETE | ZINC PLATED | Tension | $h_{ef,min} = 8d$ | N_{Rk} | [kN] | 19,3 | 25,1 | 43,4 | 64,3 | 85,4 |
| Standard stud | | | | N_{Rk} | [kN] | <u>18,0</u> | 28,2 | 49,7 | 64,3 | 90,7 | 118,7 |
| $h_{ef,max} = 12d$ | | | | N_{Rk} | [kN] | <u>18,0</u> | <u>29,0</u> | <u>42,0</u> | <u>79,0</u> | <u>128,1</u> | <u>162,8</u> |
| STAINLESS STEEL | | Tension | All depths | V_{Rk} | [kN] | <u>9,0</u> | <u>15,0</u> | <u>21,0</u> | <u>39,0</u> | <u>61,0</u> | <u>88,0</u> |
| | | | $h_{ef,min} = 8d$ | N_{Rk} | [kN] | 19,3 | 25,1 | 43,4 | 64,3 | 85,4 | 108,5 |
| | | | Standard stud | N_{Rk} | [kN] | 24,1 | 28,2 | 49,7 | 64,3 | 90,7 | 118,7 |
| STAINLESS STEEL | | Tension | $h_{ef,max} = 12d$ | N_{Rk} | [kN] | <u>26,0</u> | 37,7 | <u>59,0</u> | 96,5 | 128,1 | 162,8 |
| | | | All depths | V_{Rk} | [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> |

| DESIGN RESISTANCES | | | | | | | | | | | | | |
|--------------------|----------------------|-------------|--------------------|-------------------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|------|------|
| CONCRETE CLASS | SIZE | | | | | M8 | M10 | M12 | M16 | M20 | M24 | | |
| | NON-CRACKED CONCRETE | ZINC PLATED | Tension | $h_{ef,min} = 8d$ | N_{Rd} | [kN] | 10,7 | 13,9 | 24,1 | 35,7 | 47,4 | 60,3 | |
| Standard stud | | | | N_{Rd} | [kN] | <u>12,0</u> | 15,7 | 27,6 | 35,7 | 50,4 | 65,9 | | |
| $h_{ef,max} = 12d$ | | | | N_{Rd} | [kN] | <u>12,0</u> | <u>19,3</u> | <u>28,0</u> | <u>52,6</u> | 71,2 | 90,4 | | |
| STAINLESS STEEL | | Tension | $h_{ef,min} = 8d$ | N_{Rd} | [kN] | 10,7 | 13,9 | 24,1 | 35,7 | 47,4 | 60,3 | | |
| | | | Standard stud | N_{Rd} | [kN] | 13,4 | 15,7 | 27,6 | 35,7 | 50,4 | 65,9 | | |
| | | | $h_{ef,max} = 12d$ | N_{Rd} | [kN] | <u>13,6</u> | 20,9 | <u>31,0</u> | 53,6 | 71,2 | 90,4 | | |
| ZINC PLATED | | Shear | All depths | V_{Rd} | [kN] | <u>7,2</u> | <u>12,0</u> | <u>16,8</u> | <u>31,2</u> | <u>48,8</u> | <u>70,4</u> | | |
| | | | STAINLESS STEEL | Tension | $h_{ef,min} = 8d$ | N_{Rd} | [kN] | 10,7 | 13,9 | 24,1 | 35,7 | 47,4 | 60,3 |
| | | | | | Standard stud | N_{Rd} | [kN] | 13,4 | 15,7 | 27,6 | 35,7 | 50,4 | 65,9 |
| $h_{ef,max} = 12d$ | N_{Rd} | [kN] | | | <u>13,6</u> | 20,9 | <u>31,0</u> | 53,6 | 71,2 | 90,4 | | | |
| STAINLESS STEEL | Shear | All depths | V_{Rd} | [kN] | <u>8,3</u> | <u>12,8</u> | <u>19,2</u> | <u>35,2</u> | <u>55,1</u> | <u>79,4</u> | | | |

MAXIMUM LOADS RECOMMENDED (when $\gamma_F = 1.4$)

| CONCRETE CLASS | SIZE | | | | | M8 | M10 | M12 | M16 | M20 | M24 | | |
|--------------------|----------------------|-------------|--------------------|-------------------|-------------------|------------|-------------|-------------|-------------|-------------|-------------|------|------|
| | NON-CRACKED CONCRETE | ZINC PLATED | Tension | $h_{ef,min} = 8d$ | N_{rec} | [kN] | 7,6 | 9,9 | 17,2 | 25,5 | 33,9 | 43,0 | |
| Standard stud | | | | N_{rec} | [kN] | <u>8,5</u> | 11,2 | 19,7 | 25,5 | 36,0 | 47,1 | | |
| $h_{ef,max} = 12d$ | | | | N_{rec} | [kN] | <u>8,5</u> | <u>13,8</u> | <u>20,0</u> | <u>37,6</u> | 50,8 | 64,6 | | |
| STAINLESS STEEL | | Tension | $h_{ef,min} = 8d$ | N_{rec} | [kN] | 7,6 | 9,9 | 17,2 | 25,5 | 33,9 | 43,0 | | |
| | | | Standard stud | N_{rec} | [kN] | 9,5 | 11,2 | 19,7 | 25,5 | 36,0 | 47,1 | | |
| | | | $h_{ef,max} = 12d$ | N_{rec} | [kN] | <u>9,7</u> | 14,9 | <u>22,1</u> | 38,3 | 50,8 | 64,6 | | |
| ZINC PLATED | | Shear | All depths | V_{rec} | [kN] | <u>5,1</u> | <u>8,5</u> | <u>12,0</u> | <u>22,2</u> | <u>34,8</u> | <u>50,2</u> | | |
| | | | STAINLESS STEEL | Tension | $h_{ef,min} = 8d$ | N_{rec} | [kN] | 7,6 | 9,9 | 17,2 | 25,5 | 33,9 | 43,0 |
| | | | | | Standard stud | N_{rec} | [kN] | 9,5 | 11,2 | 19,7 | 25,5 | 36,0 | 47,1 |
| $h_{ef,max} = 12d$ | N_{rec} | [kN] | | | <u>9,7</u> | 14,9 | <u>22,1</u> | 38,3 | 50,8 | 64,6 | | | |
| STAINLESS STEEL | Shear | All depths | V_{rec} | [kN] | <u>5,9</u> | <u>9,1</u> | <u>13,7</u> | <u>25,1</u> | <u>39,3</u> | <u>56,7</u> | | | |

1 kN \approx 100 kg
The italic font underlined values indicate steel failure; rest indicates pull-out failure.

| COEFFICIENTS FOR TENSION LOADS IN PULL-OUT FAILURE IN HIGH-RESISTANCE CONCRETE TYPES | | | |
|---|--------|--------|--------|
| CONCRETE COEFFICIENT | C30/37 | C40/50 | C50/60 |
| Ψ_c (Non-cracked) | 1,12 | 1,19 | 1,30 |

6.2 CHEMICAL RESISTANCE

Chemical resistance of the product for different kind of chemical environments and for a specific concentration.

| Chemical Environment | Concentration | Result | Chemical Environment | Concentration | Result |
|---|---------------|---------|---|---------------|---------|
| Aqueous Solution Acetic Acid | 10% | ✓ | Hexane | 100% | C |
| Acetone | 100% | NO DATA | Hydrochloric Acid | 10% | ✓ |
| Aqueous Solution Aluminium Chloride | Saturado | ✓ | | 15% | ✓ |
| Aqueous Solution Aluminium Nitrate | 10% | ✓ | | 25% | C |
| Ammonia Solution | 5% | NO DATA | Hydrogen Sulphide Gas | 100% | ✓ |
| Jet Fuel | 100% | NO DATA | Isopropyl Alcohol | 100% | NO DATA |
| Benzene | 100% | NO DATA | Linseed Oil | 100% | ✓ |
| Benzoic Acid | Saturado | ✓ | Lubricating Oil | 100% | ✓ |
| Benzyl Alcohol | 100% | NO DATA | Mineral Oil | 100% | ✓ |
| Sodium Hypochlorite Solution | 5 - 15% | ✓ | Paraffin / Kerosene (Domestic) | 100% | C |
| Butyl Alcohol | 100% | C | Phenol Aqueous Solution | 1% | NO DATA |
| Calcium Sulphate Aqueous Solution | Saturado | ✓ | Phosphoric Acid | 50% | ✓ |
| Carbon Monoxide | Gas | ✓ | Potassium Hydroxide | 10% / pH13 | C |
| Carbon Tetrachloride | 100% | NO DATA | Sea Water | 100% | C |
| Chlorine Water | Saturado | NO DATA | Styrene | 100% | NO DATA |
| Chloro Benzene | 100% | NO DATA | Sulphur Dioxide Solution | 10% | ✓ |
| Citric Acid Aqueous Solution | Saturado | ✓ | Sulphur Dioxide (40°C) | 5% | ✓ |
| Cyclohexanol | 100% | ✓ | Sulphuric Acid | 10% | ✓ |
| Diesel Fuel | 100% | C | | 50% | ✓ |
| Diethylene Glycol | 100% | ✓ | Turpentine | 100% | C |
| Ethanol | 95% | NO DATA | White Spirit | 100% | ✓ |
| Ethanol Aqueous Solution | 20% | C | Xylene | 100% | NO DATA |
| Heptane | 100% | C | Contact only to a maximum of 25°C. | | C |
| Resistant to 75°C with at least 80% of physical properties retained. | | ✓ | Not Resistant | | X |

7. OFFICIAL DOCUMENTATION

The following documents are available through our Sales Department or on our official website: www.4tecX.com:

- MOV Safety Data Sheet.
- European Technical Assessment ETA 13/0753 for use on non-cracked concrete according to EAD 330499-00-0601 Guide, option 7, for M8 to M24.
- Certification AVCP 1020-CPR-090-041424 for use in concrete.
- Declaration of Performance DoP MOV