

Vorpa VF CE

Vinylester resin capsule spin-in type with European Technical Assessment for non cracked concrete



non-cracked concrete

products group



Approved for

- non cracked concrete M8-M24

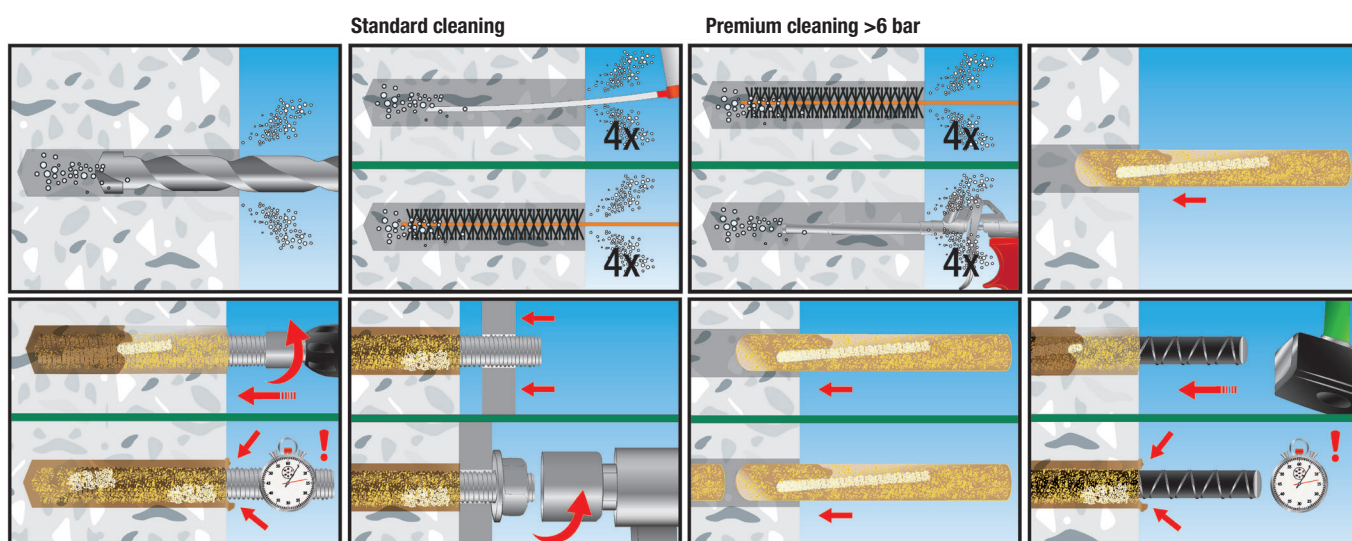
To fix

- starter bar applications
- threaded studs
- crush barriers
- machinery - cladding
- steel columns
- guardrails
- noise protection walls
- balustrades



ETAG 001-05
non cracked concrete M8-M24

installation sequence



product code

| Code | Description | Length mm | Shelf life |
|------|-------------|-----------|------------|
| 5900 | VF CE M 8 | 80 | 24 months |
| 5901 | VF CE M 10 | 85 | 24 months |
| 5902 | VF CE M 12 | 95 | 24 months |
| 5904 | VF CE M 16 | 95 | 24 months |
| 5906 | VF CE M 20 | 160 | 24 months |
| 5908 | VF CE M 24 | 190 | 24 months |



Examples of applications



Vorpa VF CE

Vinylester resin capsule spin-in type with European Technical Assessment for non cracked concrete



product information

Characteristics

- chemical anchors VF CE consist of a capsule containing a blend of resin, quartz, sand and special hardener encapsulated in a small glass capsule. The capsule is placed into a drilled hole previously cleaned and threaded rod is driven by machine with turning (simultaneous hammering and turning)
- capsules can be set in either direction
- quick curing and gel time
- no waste of material. Safe and easy to use
- chemical corrosion resistant
- can be installed in wet concrete or in hole filled with water
- suitable for close edge applications, no tension on base material

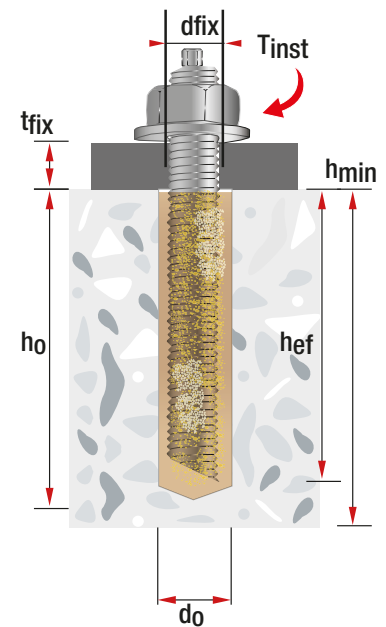
Suggestion for use

- avoid direct sunlight
- **clean out hole thoroughly before application**
- anchors to be tightened with calibrated torque wrench
- see ETA for more details

technical data

Specification data

| | | | M8 | M10 | M12 | M16 | M20 | M24 |
|--------------------------|------------|----|-----|-----|-----|-----|-----|-----|
| Hole diameter | d_o | mm | 10 | 12 | 14 | 18 | 25 | 28 |
| Hole diameter in fixture | d_{fix} | mm | 9 | 12 | 14 | 18 | 22 | 26 |
| Minimum hole depth | h_o | mm | 80 | 90 | 110 | 125 | 170 | 210 |
| Minimum slab thickness | h_{min} | mm | 110 | 120 | 150 | 160 | 220 | 300 |
| Torque moment | T_{inst} | Nm | 10 | 20 | 40 | 60 | 120 | 150 |
| Minimum spacing | S_{min} | mm | 60 | 70 | 85 | 95 | 130 | 160 |
| Minimum edge distance | C_{min} | mm | 60 | 70 | 85 | 95 | 130 | 160 |



Minimum curing time and working time

| Concrete temperature (°C) | Minimum curing time (dry concrete) minutes | Minimum curing time (wet concrete) minutes |
|---------------------------|--|--|
| -5° - 0 | 360 | 720 |
| 0 - 5 | 180 | 360 |
| 5 - 10 | 90 | 180 |
| 10 - 20 | 40 | 80 |
| > 20 | 20 | 40 |

Examples of applications





technical data

Performance data

| Threaded size | | | M8 | M10 | M12 | M16 | M20 | M24 |
|--|------------|----|------|------|------|-------|------|-------|
| Embedment depth | h_{ef} | mm | 80 | 90 | 110 | 125 | 170 | 210 |
| Tension load | | | | | | | | |
| Standard cleaning | | | | | | | | |
| Characteristic resistance non cracked concrete C20/25 - (50/80°C) | $N_{Rk,P}$ | kN | 9 | 12 | 16 | 25 | 40 | 60 |
| Design resistance $\gamma_{MC}=1.8$ | $N_{Rd,s}$ | kN | 5 | 6,6 | 8,8 | 13,8 | 22,2 | 33,3 |
| Premium cleaning | | | | | | | | |
| Characteristic resistance non cracked concrete C20/25 - (50/80°C) | $N_{Rk,P}$ | kN | 12 | 16 | 25 | 35 | 60 | 75 |
| Design resistance $\gamma_{MC}=1.8$ | $N_{Rd,s}$ | kN | 6,6 | 8,8 | 13,8 | 19,4 | 33,3 | 41,6 |
| Increasing factors | | | | | | | | |
| C30/37 | ψ_c | | | | 1,08 | | | |
| C40/50 | ψ_c | | | | 1,15 | | | |
| C50/60 | ψ_c | | | | 1,19 | | | |
| Shear load | | | | | | | | |
| Steel Failure, Steel Grade 5.8 | | | | | | | | |
| Characteristic resistance | $V_{Rk,c}$ | kN | 8 | 13 | 19 | 36 | 57 | 83 |
| Design resistance $\gamma_{Ms}=1.3$ | $V_{Rd,c}$ | kN | 6,2 | 10 | 14,6 | 27,6 | 43,8 | 63,8 |
| Steel Failure, A4 - 70 Steel Grade | | | | | | | | |
| Characteristic resistance | $V_{Rk,c}$ | kN | 11 | 17 | 26 | 49 | 77 | 111 |
| Design resistance $\gamma_{Ms}=1.56$ | $V_{Rd,c}$ | kN | 7 | 10,8 | 16,6 | 31,4 | 49,3 | 71,2 |
| Bending Moment | | | | | | | | |
| Steel Failure, Steel Grade 8.8 | | | | | | | | |
| Characteristic resistance | $M_{Rk,s}$ | kN | 16 | 30 | 56 | 144 | 285 | 498 |
| Design resistance $\gamma_{Ms}=1.3$ | $M_{Ra,s}$ | kN | 12,3 | 23 | 43 | 110 | 219 | 383 |
| Steel Failure, A4 - 70 Steel Grade | | | | | | | | |
| Characteristic resistance | $M_{Rk,s}$ | kN | 22 | 41 | 75 | 194 | 384 | 670 |
| Design resistance $\gamma_{Ms}=1.56$ | $V_{Rd,s}$ | kN | 14 | 26,2 | 48 | 124,3 | 246 | 429,4 |

Performance data

| Edge distance (tension load) | | | | | | |
|---------------------------------|------|------|------|------|------|------|
| C_N | M8 | M10 | M12 | M16 | M20 | M24 |
| mm | | | | | | |
| 40 | 0.55 | | | | | |
| 45 | 0.58 | 0.54 | | | | |
| 55 | 0.63 | 0.59 | 0.54 | | | |
| 65 | 0.69 | 0.64 | 0.58 | 0.53 | | |
| 75 | 0.76 | 0.69 | 0.62 | 0.56 | | |
| 85 | 0.82 | 0.74 | 0.66 | 0.59 | 0.54 | |
| 95 | 0.89 | 0.80 | 0.70 | 0.62 | 0.57 | |
| 105 | 0.96 | 0.85 | 0.74 | 0.65 | 0.59 | 0.56 |
| 120 | 1.00 | 0.94 | 0.81 | 0.70 | 0.63 | 0.59 |
| 135 | | 1.00 | 0.88 | 0.75 | 0.67 | 0.63 |
| 150 | | | 0.95 | 0.80 | 0.71 | 0.66 |
| 175 | | | 1.00 | 0.89 | 0.79 | 0.72 |
| 200 | | | | 0.99 | 0.86 | 0.79 |
| 225 | | | | 1.00 | 0.94 | 0.85 |
| 250 | | | | | 1.00 | 0.92 |
| 275 | | | | | | 0.99 |
| 300 | | | | | | 1.00 |
| 335 | | | | | | |

| Edge distance (shear) | | | | | | |
|--------------------------|------|------|------|------|------|------|
| C_V | M8 | M10 | M12 | M16 | M20 | M24 |
| mm | | | | | | |
| 40 | 0.36 | | | | | |
| 50 | 0.45 | 0.38 | | | | |
| 60 | 0.54 | 0.46 | 0.37 | | | |
| 70 | 0.63 | 0.54 | 0.44 | 0.35 | | |
| 80 | 0.72 | 0.62 | 0.50 | 0.40 | | |
| 90 | 0.81 | 0.69 | 0.56 | 0.44 | 0.37 | |
| 100 | 0.90 | 0.77 | 0.62 | 0.49 | 0.41 | |
| 120 | 1.08 | 0.92 | 0.75 | 0.59 | 0.49 | 0.43 |
| 140 | 1.26 | 1.08 | 0.87 | 0.69 | 0.57 | 0.50 |
| 160 | 1.44 | 1.23 | 1.00 | 0.79 | 0.66 | 0.58 |
| 180 | | 1.38 | 1.12 | 0.89 | 0.74 | 0.65 |
| 200 | | 1.54 | 1.25 | 0.99 | 0.82 | 0.72 |
| 220 | | | 1.37 | 1.09 | 0.90 | 0.79 |
| 260 | | | 1.62 | 1.28 | 1.07 | 0.94 |
| 320 | | | | 1.58 | 1.31 | 1.15 |
| 360 | | | | | 1.48 | 1.30 |
| 405 | | | | | | 1.46 |
| 450 | | | | | | |
| 490 | | | | | | |

| Spacing | | | | | | |
|---------|------|------|------|------|------|------|
| S | M8 | M10 | M12 | M16 | M20 | M24 |
| mm | | | | | | |
| 40 | 0.59 | | | | | |
| 50 | 0.61 | 0.60 | | | | |
| 60 | 0.64 | 0.62 | 0.59 | | | |
| 70 | 0.66 | 0.63 | 0.61 | 0.59 | | |
| 80 | 0.68 | 0.65 | 0.62 | 0.60 | | |
| 90 | 0.70 | 0.67 | 0.64 | 0.61 | 0.59 | |
| 100 | 0.73 | 0.69 | 0.66 | 0.62 | 0.60 | |
| 120 | 0.77 | 0.73 | 0.69 | 0.65 | 0.62 | 0.61 |
| 140 | 0.82 | 0.77 | 0.72 | 0.67 | 0.64 | 0.63 |
| 160 | 0.86 | 0.81 | 0.75 | 0.70 | 0.66 | 0.64 |
| 180 | 0.91 | 0.85 | 0.78 | 0.72 | 0.68 | 0.66 |
| 200 | 0.95 | 0.88 | 0.81 | 0.75 | 0.70 | 0.68 |
| 220 | 1.00 | 0.92 | 0.84 | 0.77 | 0.73 | 0.70 |
| 260 | | 1.00 | 0.90 | 0.82 | 0.77 | 0.73 |
| 320 | | | 1.00 | 0.90 | 0.83 | 0.79 |
| 360 | | | | 0.94 | 0.87 | 0.82 |
| 405 | | | | 1.00 | 0.91 | 0.86 |
| 450 | | | | | 0.96 | 0.91 |
| 490 | | | | | 1.00 | 0.94 |
| 550 | | | | | | 1.00 |
| 600 | | | | | | |
| 670 | | | | | | |