

Bonded anchor CV.PSF

| Intended use of the construction product according to ETAG 001 parts 1 and 5 (EAD) | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Generic type | Bonded anchor for threaded rods |
| Base material | Non cracked concrete C20/25 a C50/60 - EN 206-1:2003 |
| Material | Galvanized steel / Stainless steel / Hot dipped galvanized steel |
| Loads | Static, quasi static |
| Service temperature | A - Winter) max. short term temp. +40°C and max. long term temp. +24°C B - Standard) max. short term temp +80°C and max. long term temp. +50°C |
| Use categories | Category 1: dry and wet concrete. Category 2: flooded holes with exception of seawater Overhead installation permitted. |
| Manufacturer information | |
| VORPA s.r.l. Vial San Leo, 5 – 47838 – Riccione (RN) – ITALY Tel. +39 0541/607111 vorpa@vorpa.com – www.vorpa.com | |
| Certificate information | |
| ETA 15/0030 issued by | ETA Danmark A/S Goteborg Plads 1 DK-2150 Nordhavn |
| On the basis of | ETAG 001 (EAD) |
| Certificate of conformity 1404-CPR-2621 Issued by | Zavod za Gradbenistvo Slovenije (ZAG) Dimičeva ulica 12, 1000 Ljubljana |
| Under system | 1 |

| Declared performance according to ETAG 001 parts 1 and 5 (EAD) | | | | | | | | | | |
|----------------------------------------------------------------|-------------------------------------------|------|-----------------------------------|-----|-----|-----------------------------------|--|--|--|--|
| Essential characteristics | | | Performance | | | | | | | |
| | | | M8 | M10 | M12 | M16 | | | | |
| Installation parameters (Threaded rods) | | | | | | | | | | |
| D | Diameter of anchor bolt or thread | [mm] | 8 | 10 | 12 | 16 | | | | |
| d ₀ | Nominal diameter of drill bit | [mm] | 10 | 12 | 14 | 18 | | | | |
| h _{ef} | Minimum effective anchorage depth | [mm] | 60 | 60 | 70 | 80 | | | | |
| | Maximum effective anchorage depth | | 160 | 200 | 240 | 320 | | | | |
| h _{eff} | Nominal anchorage depth | [mm] | 80 | 90 | 110 | 125 | | | | |
| d _{fix} | Diameter of clearance hole in the fixture | [mm] | 9 | 12 | 14 | 18 | | | | |
| h _{min} | Minimum thickness of the concrete member | [mm] | h _{ef} + 30 mm (≥100 mm) | | | h _{ef} + 2d ₀ | | | | |
| T _{inst} | Setting torque | [Nm] | 8 | 10 | 15 | 25 | | | | |
| s _{min} | Minimum spacing | [mm] | 0.5 h _{ef} | | | | | | | |
| c _{min} | Minimum edge distance | [mm] | 0.5 h _{ef} | | | | | | | |

| Tension – Steel failure mode | | | | | | | | | | |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------|------|------|------|--|--|--|--|
| | | | M8 | M10 | M12 | M16 | | | | |
| $N_{Rk,s}$ | Tension steel characteristic failure (5.8) | [kN] | 18 | 29 | 42 | 79 | | | | |
| $N_{Rk,s}$ | Tension steel characteristic failure (8.8) | [kN] | 29 | 46 | 67 | 126 | | | | |
| $\gamma_{m,sN}$ | Partial safety factor | [-] | 1.5 | | | | | | | |
| $N_{Rk,s}$ | Tension steel characteristic failure (10.9) | [kN] | 36 | 58 | 84 | 157 | | | | |
| $\gamma_{m,sN}$ | Partial safety factor | [-] | 1.4 | | | | | | | |
| $N_{Rk,s}$ | Tension steel characteristic failure (A4-70) | [kN] | 26 | 41 | 59 | 110 | | | | |
| $\gamma_{m,sN}$ | Partial safety factor | [-] | 1.87 | | | | | | | |
| $N_{Rk,s}$ | Tension steel characteristic failure (HCR) | [kN] | 29 | 46 | 67 | 126 | | | | |
| $\gamma_{m,sN}$ | Partial safety factor | [-] | 1.5 | | | | | | | |
| Combined Pull-out and concrete cone failure | | | | | | | | | | |
| Characteristic bond resistance in non cracked concrete C20/25 – Category 1 – Dry or wet concrete | | | | | | | | | | |
| $\tau_{Rk,ucr}$ | Characteristic bond resistance In non-cracked concrete class C20/25 (Temperature range A) | [MPa] | 6.0 | 5.5 | 5.0 | 4.0 | | | | |
| | Characteristic bond resistance In non-cracked concrete class C20/25 (Temperature range B) | [MPa] | 4.5 | 4.0 | 3.5 | 3.0 | | | | |
| $\gamma_{Mp}=\gamma_{Mc}$ | Partial safety factor – category 1 | [-] | 2.1 | 1.8 | | | | | | |
| Characteristic bond resistance in non cracked concrete C20/25 – Category 2 – Flooded holes | | | | | | | | | | |
| $\tau_{Rk,ucr}$ | Characteristic bond resistance In non-cracked concrete class C20/25 (Temperature range A) | [MPa] | 5.0 | 4.0 | 4.0 | 3.5 | | | | |
| | Characteristic bond resistance In non-cracked concrete class C20/25 (Temperature range B) | [MPa] | 3.5 | 3.0 | 3.0 | 3.0 | | | | |
| $\gamma_{Mp}=\gamma_{Mc}$ | Partial safety factor – category 2 | [-] | 2.1 | | | | | | | |
| ψ_c C30/37 | Increasing factor for non-cracked concrete C30/37 | [-] | 1.08 | | | | | | | |
| ψ_c C40/50 | Increasing factor for non-cracked concrete C40/50 | [-] | 1.15 | | | | | | | |
| ψ_c C50/60 | Increasing factor for non-cracked concrete C50/60 | [-] | 1.19 | | | | | | | |
| Splitting failure | | | | | | | | | | |
| $s_{cr,sp}$ | Critical spacing (splitting) | [mm] | 2 $C_{cr,sp}$ | | | | | | | |
| $C_{cr,sp}$ | Critical edge distance (splitting) | [mm] | $h / h_{ef} \geq 2.0 = 1.0 h_{ef}$ $2.0 > h / h_{ef} > 1.3 = 4.6 h_{ef} - 1.8 h$ $h / h_{ef} \leq 1.3 = 2.25 h_{ef}$ | | | | | | | |
| Displacement on Tension load | | | | | | | | | | |
| Non-cracked concrete – Temperature range A | | | | | | | | | | |
| F | Admissible service load | [kN] | 9.0 | 10.4 | 13.2 | 16.1 | | | | |
| δ_{N0} | Short term displacement under tension load | [mm] | 0.22 | 0.21 | 0.19 | 0.25 | | | | |
| $\delta_{N\infty}$ | Long term displacement under tension load | [mm] | - | - | 0.29 | - | | | | |
| Non-cracked concrete – Temperature range B | | | | | | | | | | |
| F | Admissible service load | [kN] | 6.8 | 7.5 | 9.2 | 12.1 | | | | |
| δ_{N0} | Short term displacement under tension load | [mm] | 0.35 | 0.33 | 0.30 | 0.40 | | | | |
| $\delta_{N\infty}$ | Long term displacement under tension load | [mm] | - | - | 0.38 | - | | | | |

| Shear – Steel failure | | | | | | | | | |
|-------------------------------|---------------------------------------------------|-------------|------|------|------|------|--|--|--|
| $V_{RK,s}$ | Shear characteristic failure (5.8) | [kN] | 9 | 15 | 21 | 39 | | | |
| $V_{RK,s}$ | Shear characteristic failure (8.8) | [kN] | 15 | 23 | 34 | 63 | | | |
| $\gamma_{m,sV}$ | Partial safety factor | [-] | 1.25 | | | | | | |
| $V_{RK,s}$ | Shear characteristic failure (10.9) | [kN] | 18 | 29 | 42 | 79 | | | |
| $\gamma_{m,sV}$ | Partial safety factor | [-] | 1.50 | | | | | | |
| $V_{RK,s}$ | Shear characteristic failure (A4-70) | [kN] | 13 | 20 | 30 | 55 | | | |
| $\gamma_{m,sV}$ | Partial safety factor | [-] | 1.56 | | | | | | |
| $V_{RK,s}$ | Shear characteristic failure (HCR) | [kN] | 15 | 23 | 34 | 62.8 | | | |
| $\gamma_{m,sV}$ | Partial safety factor | [-] | 1.25 | | | | | | |
| $M^0_{RK,s}$ | Bending moment characteristic failure (5.8) | [kN] | 19 | 37 | 66 | 167 | | | |
| $M^0_{RK,s}$ | Bending moment characteristic failure (8.8) | [kN] | 30 | 60 | 105 | 266 | | | |
| $\gamma_{m,sV}$ | Partial safety factor | [-] | 1.25 | | | | | | |
| $M^0_{RK,s}$ | Bending moment characteristic failure (10.9) | [kN] | 38 | 75 | 131 | 333 | | | |
| $\gamma_{m,sV}$ | Partial safety factor | [-] | 1.5 | | | | | | |
| $M^0_{RK,s}$ | Bending moment characteristic failure (A4-70) | [kN] | 26 | 53 | 92 | 233 | | | |
| $\gamma_{m,sV}$ | Partial safety factor | [-] | 1.56 | | | | | | |
| $M^0_{RK,s}$ | Bending moment characteristic failure (HCR) | [kN] | 30 | 60 | 105 | 266 | | | |
| $\gamma_{m,sV}$ | Partial safety factor | [-] | 1.25 | | | | | | |
| Shear – Concrete edge failure | | | | | | | | | |
| γ_{MC} | Partial safety factor | [-] | 2.1 | 1.8 | | | | | |
| Shear – Pry out failure | | | | | | | | | |
| K_3 | Factor in equation (27) of CEN/TS 1992-4-5, 6.3.3 | [-] | 2.0 | | | | | | |
| Displacement on shear load | | | | | | | | | |
| δ_{V0} | Short term displacement under shear load | [mm/ kN] | 0.06 | 0.06 | 0.05 | 0.04 | | | |
| $\delta_{V\infty}$ | Long term displacement under shear load | [mm/ kN] | 0.09 | 0.08 | 0.08 | 0.06 | | | |


The above performance apply for the following article numbers:

| Code | Type | Capacity |
|-------|-------------------|----------|
| 1129 | CV.PSF 165 | 165 ml |
| 1124 | CV.PSF 300 | 300 ml |
| 1002P | CV.PSF 410 | 410 ml |
| 1168 | CV.PSF 410 WINTER | 410 ml |

The performances of the product identified by the above identification code are in conformity with the declared performance.

This declaration of performance is issued on the basis of the European regulation (EU) N. 305/2011, under the sole responsibility of indicated Manufacturer.

Signed for and in behalf of the manufacturer by:

| Name and function | Place and date | Signature |
|------------------------------------------|----------------------|---------------------------------------------------------------------------------------|
| Roberto Vorabbi Legale Rappresentante | Riccione, 19/12/2017 |  |