

Torque Controlled anchors TOP

Intended use of the construction product according to ETAG 001 part 1 e 2	
Generic type	Torque controlled expansion anchor
Base material	Non cracked concrete C20/25 a C50/60 - EN 206-1:2003
Material	Galvanized steel / Stainless steel
Durability	ZInclated - Internal dry condition Stainless steel – Internal dry condition and structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition.
Loads	Static, quasi-static
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 09/0175 issued by (issued 22-08-2014)	Deutsches Institut für Bautechnik Anstalt des öffentlichen Rechts Kolonnenstr. 30 L 10829 Berlin Germany
On the basis of	ETAG 001 (Option 7) – EAD / 06/2013
Certificate of conformity 1220-CPR-1672 Issued by da	ITeC Institut de Tecnologia de la Construcció de Catalunya Wellington 19 – ES08018 Barcelona
Under system	1

Declared performance according to ETAG 001 parte 1 e 2 – Design method C							
Essential Characteristic			Performance				
			M6	M8	M10	M12	
Installation parameters							
d_0	Nominal diameter of drill bit	[mm]	10	12	14	18	
h_{ef}	Effective anchorage depth	[mm]	39.5	44.5	51.5	63	
h_{nom}	Minimum installation depth	[mm]	45	51	60	75	
h_{min}	Minimum thickness of the concrete member	[mm]	135	135	140	160	
T_{inst}	Setting torque	[Nm]	10	25	40	75	
s_{min}	Minimum spacing	[mm]	65	90	135	165	
c_{min}	Minimum edge distance	[mm]	45	70	85	115	
Tension – Steel failure							
$N_{Rk,s}$	Tension steel characteristic failure	[kN]	16.1	29.3	46.4	67.4	
$\gamma_{m,sN}$	Partial safety factor	[-]	1.5				
Pull-out							
$N_{Rk,p,ucr}$ TOP / TOP BU / TOPBP	Tension characteristic load in non-cracked concrete C20/25	[kN]	9.0	12.0	16.0	20.0	
γ_{mP}	Partial safety factor	[-]	1.8	2.1	2.1	1.5	
$N_{Rk,p,ucr}$ TOP A4 / TOP BU A4	Tension characteristic load in non-cracked concrete C20/25	[kN]	7.5	9.0	12.0	16.0	

γ_{mP}	Partial safety factor	[-]	1.5	1.8	1.8	1.8	
$S_{cr,N}$	Critical spacing	[mm]	3 h_{ef}				
$C_{cr,N}$	Critical edge distance	[mm]	1.5 h_{ef}				
ψ_c C30/37	Increasing factor for concrete C30/37	[-]	1.17	1.08	1.22		
ψ_c C40/50	Increasing factor for concrete C40/50	[-]	1.33	1.15	1.41		
ψ_c C50/60	Increasing factor for concrete C50/60	[-]	1.5	1.23	1.55		
Splitting failure							
$S_{cr,sp}$	Critical spacing (splitting)	[mm]	160	200	260	280	
$C_{cr,sp}$	Critical edge distance (splitting)	[mm]	80	100	130	140	
Displacement on Tension load							
N_{ucr}	Service tension load in non-cracked concrete	[kN]	3.6	4.1	5.4	9.5	
$\delta_{NO,ucr}$	Short term displacement under tension load	[mm]	0.4	0.3	0.3	0.3	
$\delta_{N\rightarrow,ucr}$	Long term displacement under tension load	[mm]	1.2	1.2	1.2	1.2	
Shear – Steel failure							
$V_{Rk,s}$ TOP / TOP BU / TOP BP	Shear characteristic failure	[kN]	8.0	14.6	23.2	33.7	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.25				
$V_{Rk,s}$ TOP A4 / TOP BU A4	Shear characteristic failure	[kN]	7.0	12.8	20.3	29.5	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.56				
$M^0_{Rk,s}$ TOP / TOP BU / TOP BP	Bending moment characteristic failure	[Nm]	12.2	30.0	59.8	104.8	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.25				
$M^0_{Rk,s}$ TOP A4 / TOP BU A4	Bending moment characteristic failure	[Nm]	10.7	26.2	52.3	91.7	
$\gamma_{m,sV}$	Partial safety factor	[-]	1.56				
Shear –Concrete edge failure							
l_{ef}	Effective anchorage length	[mm]	39.5	44.5	51.5	63	
Displacement on shear load							
V	Service shear load in non-cracked concrete	[kN]	5.1	6.9	7.6	9.5	
δ_{V0}	Short term displacement under shear load	[mm]	6.0	5.3	5.3	5.0	
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	9.0	8.0	8.0	7.5	

The above performance apply for the following article numbers::

TOP – TOP A4			
Code	d [mm]	d0 [mm]	$t_{fix\ max}$ [mm]
710	M6	10	150
3714			50
711	M8	12	200
3715			65
712	M10	14	250
3716			85
713	M12	18	300
3737			70

TOP BU – TOP BU A4			
Code	d [mm]	d0 [mm]	$t_{fix\ max}$ [mm]
720	M6	10	10
3717			10
721	M8	12	14
3718			14
722	M10	14	20
3719			20
723	M12	18	25
3720			25

TOP BP			
Code	d [mm]	d0 [mm]	$t_{fix\ max}$ [mm]
2720	M6	10	30
2721	M8	12	35
2722	M10	14	38
2723	M12	18	43

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

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

Signed for and in behalf of the manufacturer by:

Name and function	Place and date	Signature
Roberto Vorabbi Legale Rappresentante	Riccione, 14/10/2019	