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Declaration of Performance

No. **1219-CPD-0055**

Througbolt **SITA ACCIAIO CE7 GBK, GBK-A4**

Intended use of the construction product according to ETA-12/0594	
Generic type:	torque controlled expansion anchor
Base material:	non-cracked, reinforced or unreinforced normal weight concrete C20/25 to C50/60 according to EN 206-1:2000; for M6 to M14 anchor, reinforcement spacing should be higher than 150 mm
Use:	- SITA ACCIAIO CE7 CBK (zinc plated steel) dry internal conditions - SITA ACCIAIO CE7 GBK-A4 (A4 stainless steel) dry internal conditions, external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions if no particular aggressive conditions exist
Loading:	static, quasi-static

ETA-12/0594 issued by Instituto de Ciencias de la Constucción Eduardo Torroja on the basis of ETAG 001
Certificate of Conformity 1219-CPD-0055 issued by Instituto de Ciencias de la Constucción Eduardo Torroja
Under AVCP System 1

Declared performances according to ETAG 001:2010 Part 1 and Part 2, ETA-12/0594 (Design method A - ETAG 001 Annex C)									
Thread diameter			**M6**	**M8**	**M10**	**M12**	**M14**[1]	**M16**	**M20**
Essential Characteristics			**Performance**						
Installation parameters, standard embedment depth									
d_0	Nominal diameter of drill bit	[mm]	6	8	10	12	14	16	20
h_{ef}	Effective anchorage depth	[mm]	40	48	55	65	75	84	103
h_{nom}	Minimum installation depth	[mm]	49.5	59.5	66.5	77	91	130.5	125
h_{min}	Minimum thickness of the concrete member	[mm]	100	100	110	130	150	168	206
s_{min}	Minimum spacing	[mm]	50	65	70	85	100	110	135
c_{min}	Minimum edge distance	[mm]	50	65	70	85	100	110	135
T_{inst}	Installation torque	[Nm]	7	20	35	60	90	120	240
Installation parameters, reduced embedment depth									
d_0	Nominal diameter of drill bit	[mm]	-	8	10	12	-	-	-
h_{ef}	Effective anchorage depth	[mm]	-	35[2]	42	50	-	-	-
h_{nom}	Minimum installation depth	[mm]	-	46.5	53.5	62	-	-	-
h_{min}	Minimum thickness of the concrete member	[mm]	-	100	100	100	-	-	-
s_{min}	Minimum spacing	[mm]	-	65	70	85	-	-	-
c_{min}	Minimum edge distance	[mm]	-	65	70	85	-	-	-
T_{inst}	Installation torque	[Nm]	-	20	35	60	-	-	-
Tension steel failure mode - SITA ACCIAIO CE7 GBK									
$N_{Rk,s}$	Tension steel characteristic failure	[kN]	7.7	16.4	25.6	35.4	51.7	65.0	104.4
$\gamma_{m,sN}$	Partial safety factor for tension steel failure	[-]	1.40			1.43			1.47
Tension steel failure mode - SITA ACCIAIO CE7 GBK-A4									
$N_{Rk,s}$	Tension steel characteristic failure	[kN]	10.1	19.1	34.3	49.6	-	85.9	140.7
$\gamma_{m,sN}$	Partial safety factor for tension steel failure	[-]	1.68						

Pull-out failure mode, standard embedment depth									
$N_{Rk,p}$	Tension characteristic load in concrete C20/25	[kN]	n.d.[3]	12	16	25	30	35	50
γ_{Mp}	Partial safety factor	[-]	-	1.5	1.8				
Pull-out failure mode, reduced embedment depth									
$N_{Rk,p}$	Tension characteristic load in concrete C20/25	[kN]	-	9[2]	12	16	-	-	-
γ_{Mp}	Partial safety factor	[-]	-	1.5			-	-	-
$\psi_{c,C30/37}$	Increasing factor for both embedment depths for concrete C30/37	[-]	1.22						
$\psi_{c,C40/50}$	Increasing factor for both embedment depths for concrete C40/50	[-]	1.41						
$\psi_{c,C50/60}$	Increasing factor for both embedment depths for concrete C50/60	[-]	1.55						
Concrete cone failure mode, standard embedment depth									
$s_{cr,N}$	Critical spacing	[mm]	120	144	165	195	225	252	309
$c_{cr,N}$	Critical edge distance	[mm]	60	72	83	98	113	126	155
γ_{Mc}	Partial safety factor	[-]	1.5		1.8				
Concrete cone failure mode, reduced embedment depth									
$s_{cr,N}$	Critical spacing	[mm]	-	105[2]	126	150	-	-	-
$c_{cr,N}$	Critical edge distance	[mm]	-	53[2]	63	75	-	-	-
γ_{Mc}	Partial safety factor	[-]	-	1.5			-	-	-
Splitting failure mode, standard embedment depth									
$s_{cr,sp}$	Critical spacing (splitting)	[mm]	160	192	220	260	300	336	412
$c_{cr,sp}$	Critical edge distance(splitting)	[mm]	80	96	110	130	150	168	206
γ_{Mc}	Partial safety factor	[-]	1.5		1.8				
Splitting failure mode, reduced embedment depth									
$s_{cr,sp}$	Critical spacing (splitting)	[mm]	-	140[2]	168	200	-	-	-
$c_{cr,sp}$	Critical edge distance(splitting)	[mm]	-	70[2]	84	100	-	-	-
γ_{Mc}	Partial safety factor	[-]	-	1.5			-	-	-
Displacement on tension load, C20/25 to C50/60 - SITA ACCIAIO CE7 GBK, standard embedment depth									
N	Service tension load	[kN]	2.8	5.0	6.0	9.3	10.7	16.0	17.0
δ_{N0}	Short term displacement under tension load	[mm]	0.70	1.12	1.07	1.32	1.82	2.38	3.56
$\delta_{N\infty}$	Long term displacement under tension load	[mm]	1.47	2.34	2.24	2.77	3.82	4.99	7.47
Displacement on tension load, C20/25 to C50/60 - SITA ACCIAIO CE7 GBK, reduced embedment depth									
N	Service tension load	[kN]	-	4.2	5.7	7.6	-	-	-
δ_{N0}	Short term displacement under tension load	[mm]	-	0.20	0.13	0.06	-	-	-
$\delta_{N\infty}$	Long term displacement under tension load	[mm]	-	1.78	1.78	1.78	-	-	-
Displacement on tension load, C20/25 to C50/60 - SITA ACCIAIO CE7 GBK-A4, standard embedment depth									
N	Service tension load	[kN]	4.3	5.7	6.3	9.9	-	13.8	19.8
δ_{N0}	Short term displacement under tension load	[mm]	0.42	0.22	0.17	0.19	-	0.19	0.11
$\delta_{N\infty}$	Long term displacement under tension load	[mm]	1.33	1.33	1.33	1.33	-	1.33	1.33
Displacement on tension load, C20/25 to C50/60 - SITA ACCIAIO CE7 GBK-A4, reduced embedment depth									
N	Service tension load	[kN]	-	4.2	5.7	7.6	-	-	-
δ_{N0}	Short term displacement under tension load	[mm]	-	0.07	0.04	0.32	-	-	-
$\delta_{N\infty}$	Long term displacement under tension load	[mm]	-	0.60	0.60	0.60	-	-	-

Shear steel failure mode - SITA ACCIAIO CE7 GBK									
$V_{Rk,s}$	Shear steel characteristic failure	[kN]	5.1	9.3	14.7	20.6	28.1	38.4	56.3
$M^0_{Rk,s}$	Bending moment characteristic failure	[Nm]	7.7	19.1	38.1	64.1	102.2	163.1	298.5
γ_{MsV}	Partial safety factor for shear steel failure	[-]	1.25						
Shear steel failure mode - SITA ACCIAIO CE7 GBK-A4									
$V_{Rk,s}$	Shear steel characteristic failure	[kN]	6.0	10.9	17.4	25.2	-	47.1	73.5
$M^0_{Rk,s}$	Bending moment characteristic failure	[Nm]	9.2	22.5	44.9	78.6	-	200	389
γ_{MsV}	Partial safety factor for shear steel failure	[-]	1.52						
Concrete edge failure mode, standard embedment depth									
l_{ef}	Effective anchorage length	[mm]	40	48	55	65	75	84	103
γ_{Mc}	Partial safety factor	[-]	1.50						
Concrete edge failure mode, reduced embedment depth									
l_{ef}	Effective anchorage length	[mm]	-	35[2]	42	50	-	-	-
γ_{Mc}	Partial safety factor	[-]	-	1.5			-	-	-
Displacement on shear load, C20/25 to C50/60 - SITA ACCIAIO CE7 GBK, standard embedment depth									
V	Service shear load in concrete	[kN]	2.9	5.3	8.4	11.8	16.0	21.9	32.1
δ_{V0}	Short term displacement under shear load	[mm]	0.65	2.80	1.75	2.45	2.78	3.53	4.13
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	0.98	4.20	2.63	3.68	4.16	5.29	6.19
Displacement on shear load, C20/25 to C50/60 - SITA ACCIAIO CE7 GBK, reduced embedment depth									
V	Service shear load in concrete	[kN]	-	5.3	8.4	11.8	-	-	-
δ_{V0}	Short term displacement under shear load	[mm]	-	0.59	1.22	1.10	-	-	-
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	-	0.89	1.83	1.65	-	-	-
Displacement on shear load, C20/25 to C50/60 - SITA ACCIAIO CE7 GBK-A4, standard embedment depth									
V	Service shear load in concrete	[kN]	2.8	5.1	8.1	11.8	-	22.1	34.5
δ_{V0}	Short term displacement under shear load	[mm]	1.66	1.79	3.83	4.13	-	5.75	6.59
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	2.49	2.68	5.74	6.16	-	8.62	9.88
Displacement on shear load, C20/25 to C50/60 - SITA ACCIAIO CE7 GBK-A4, reduced embedment depth									
V	Service shear load in concrete	[kN]	-	5.1	8.1	11.8	-	-	-
δ_{V0}	Short term displacement under shear load	[mm]	-	0.60	3.83	4.13	-	-	-
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	-	0.90	5.74	6.19	-	-	-

[1] only SITA ACCIAIO CE7 GBK (zinc plated steel)
[2] use restricted to anchoring of structural components which are statically indeterminate
[3] pull-out failure is not decisive

The performance of the product above identified is in conformity with the declared performance.

This declaration of performance is issued under the sole responsibility of G&B Fissaggi S.r.l.

Signed for and on behalf of the manufacturer by:

Andrea Maggioni, General manager

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