Declaration of Performance No. 0679-CPR-1041

Thunderbolt (Undercut anchor made of carbon steel)

Hexstone Ltd.
Opal Way, Stone Business Park, Stone, Staffs ST15 0SW

Intended use or uses of the products according to ETAG 001 Parts 1 and 3	
Generic type	Screw Anchor
Base material	Cracked and Non-cracked concrete C20/25 to C50/60 acc. EN 206-2:2003
Batch Number	Marked on individual boxes
Material	Carbon steel
Finish	Zinc plated and yellow passivated M8, M18 & M12 Min 5mμ Mechanical galvanised M14 & M16, 20 -25mμ
Durability	Dry internal conditions
Loading	Static, quasi-static
Fire Resistance	120mins
Fire Reaction	According to TR020
ETA 15/0040 issued by	DIBt
On the basis of	ETAG 001 Part 3 Undercut anchors
Certificate of Conformity0679-CPR-1041 issued by	CSTB
Under system	1

Declared performances according to ETAG 001 Parts 1 and 3								
Essential Characteristics			Performance					
			M08	M10	M12	M14	M16	
Installation parameters								
d_o	Nominal diameter of drill bit	[mm]	8	10	12	14	16	
d_s	Outside diameter of thread	[mm]	10	12	14	16	18	
A/F	Width across flats	[mm]	15	17	19	24	27	
d_f	Fixture clearance hole	[mm]	12	14	16	18	20	
h_{nom}	Overall anchor embedment depth	[mm]	75	85	95	110	120	
h_{ef}	Effective anchorage depth	[mm]	55	62	69	79	86	
h_1	Depth of drill hole to deepest point	[mm]	90	100	110	130	145	
h_{min}	Minimum thickness of concrete member	[mm]	120	125	140	170	190	
T_{inst}	Setting torque	[Nm]	40	60	80	90	100	
S_{min}	Minimum spacing	[mm]	50	60	70	80	90	
C_{min}	Minimum edged distance	[mm]	50	60	70	80	90	
Tensile Steel failure								
$N_{Rk,s}$	Characteristic tensile steel failure	[kN]	44.2	70.1	101.2	140	183.9	
$\gamma M,s$	Partial safety factor	[-]	1.4					
Pull-out failure								
NRk,p,cr	Characteristic tensile load in cracked concrete C20/25	[kN]	7.5	12	16	20	25	
NRk,p,ucr	Characteristic tensile load in non-cracked concrete C20/25	[kN]	12	16	20	35	40	
$\gamma M,p$	Partial safety factor (Includes $\gamma 2$)	[-]	1.8					
$S_{cr,N}$	Critical spacing	[mm]	165	186	207	237	258	
$C_{,cr,N}$	Critical edge distance	[mm]	82.5	93	103.5	119	129	
ΨcC30/37	Increasing factor for concrete C30/37	[-]	1.17			1.22		
ΨcC40/50	Increasing factor for concrete C40/50	[-]	1.32			1.41		
ΨcC50/60	Increasing factor for concrete C50/60	[-]	1.42			1.55		
Splitting for minimum thickness of concrete member								
h_{min}	Minimum thickness of concrete	[mm]	120	125	140	170	190	
$S_{cr,sp}$	Critical spacing (Splitting)	[mm]	176	190	214	250	260	
$C_{cr,sp}$	Critical edge distance (Splitting)	[mm]	88	95	107	125	130	
Concrete cone failure								
h_{ef}	Effective anchorage depth	[mm]	55	62	69	79	86	
$S_{cr,N}$	Critical spacing	[mm]	165	186	207	237	258	
$C_{cr,N}$	Critical edge distance	[mm]	82.5	93	103.5	119	129	

Displacement under tensile loading								
N	Tensile loads	[kN]	4.8	6.3	7.9	13.9	15.9	
$\delta N0$	Short term displacement under tensile loads	[mm]	0.17	0.2	0.23	0.7	0.46	
$\delta N\infty$	Long term displacement under tensile loads	[mm]	1.75	1.88	1.82	1.54	1.0	
Displacement under shear loading								
V	Shear loads	[kN]	11.3	18.4	22.7	31.9	33.5	
$\delta V0$	Short term displacement under shear loads	[mm]	1.61	1.53	1.94	2.74	2.66	
$\delta\varsigma\infty$	Long term displacement under shear loads	[mm]	2.42	2.3	2.92	4.1	3.99	
Shear steel failure								
$V_{,Rk,s}$	Characteristic shear steel failure	[kN]	28.5	46.4	57.2	80.4	84.4	
$M^0_{Rk,s}$	Characteristic bending moment	[Nm]	40	80	138	224	338	
$\gamma M,s$	Partial safety factor	[-]	1.5					
Concrete pryout failure								
k_3	Factor in equation (16) of CEN/TS 1992-4-4, 6.2.2.3	[-]	1.0	2.0				
$\gamma M,cp$	Partial safety factor	[-]	1.8					
Shear concrete edge failure								
l_f	Effective length of anchor in shear loading	[mm]	55	62	69	79	86	
Characteristic Tensile Fire Resistance in cracked or non-cracked concrete C20/25 to C50/60								
$N_{,Rk,s,fi30}$	Fire Resistance duration = 30 mins	[kN]	0.4	1.1	2.0	2.8	3.7	
$N_{,Rk,s,fi60}$	Fire Resistance duration = 60 mins	[kN]	0.4	0.9	1.5	2.1	2.8	
$N_{,Rk,s,fi90}$	Fire Resistance duration = 90 mins	[kN]	0.3	0.7	1.3	1.8	2.4	
$N_{,Rk,s,fi120}$	Fire Resistance duration = 120 mins	[kN]	0.2	0.6	1.0	1.4	1.8	
$S_{cr,N}$	Characteristic Spacing	[mm]	$4 \times h_{ef}$					
$C_{cr,N}$	Characteristic Edge Distance	[mm]	$2 \times h_{ef}$					
Characteristic Shear Fire Resistance without lever arm in cracked or non-cracked concrete C20/25 to C50/60								
$V_{,Rk,s,fi30}$	Fire Resistance duration = 30 mins	[kN]	0.4	1.1	2.0	2.8	3.7	
$V_{,Rk,s,fi60}$	Fire Resistance duration = 60 mins	[kN]	0.4	0.9	1.5	2.1	2.8	
$V_{,Rk,s,fi90}$	Fire Resistance duration = 90 mins	[kN]	0.3	0.7	1.3	1.8	2.4	
$V_{,Rk,s,fi120}$	Fire Resistance duration = 120 mins	[kN]	0.2	0.6	1.0	1.4	1.8	
Characteristic Tensile Fire Resistance with lever arm in cracked or non-cracked concrete C20/25 to C50/60								
$M^0_{,Rk,s,fi30}$	Fire Resistance duration = 30 mins	[kN]	0.5	1.5	3.4	5.6	8.4	
$M^0_{,Rk,s,fi60}$	Fire Resistance duration = 60 mins	[kN]	0.4	1.3	2.6	4.2	6.3	
$M^0_{,Rk,s,fi90}$	Fire Resistance duration = 90 mins	[kN]	0.3	1	2.2	3.6	5.5	
$M^0_{,Rk,s,fi120}$	Fire Resistance duration = 120 mins	[kN]	0.2	0.8	1.7	2.8	4.2	

The previous performance data relates to the following product codes

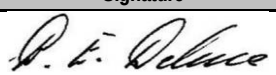
d	Marking d_o/L	L [mm]	t_{fix} [mm]	Product Code
M8	APT8x80	80	5	V35156CE
	APT8x100	100	25	V35157CE
	APT8x130	130	55	V35158CE
	APT8x150	150	75	V35159CE
M10	APT10x100	100	15	V35162CE
	APT10x130	130	45	V35163CE
	APT10x150	150	65	V35164CE
M12	APT12x100	100	5	V35166CE
	APT12x130	130	35	V35167CE
	APT12x150	150	55	V35168CE
	APT12x200	200	105	V35169CE
M14	APT14x130	130	20	V35176CE
	APT14x150	150	40	V35177CE
	APT14x200	200	90	V35178CE
M16	APT16x150	150	30	V35171CE
	APT16x200	200	80	V35172CE

Anchors are to be installed using a an electrical impact screwdriver Bosch GDS18E, Makita 6905H. Other impact electrical screwdrivers of equivalent force and performance may be used.

The performances of the product identified by the above product codes are in conformity with the declared performance

This Declaration of performance is issued under the sole responsibility of JCP Construction products

Signed for and on behalf of the manufacturers

Name and function	Place and date of issue	Signature
Brian Deluce	Teddington	
Technical Manager	9th September 2015	