Declaration of Performance
DoP MTP-X-en

1. Product type: MTP-X anchor

2. Identification

Code	L – Length [mm]	Metric [mm]	Ø Outer diameter [mm]	Fixture thickness [mm]
APX08LLL	3 last digits of product code	M8	8	L-66
APX10LLL		M10	10	L-80
APX12LLL		M12	12	L-96
APX16LLL		M16	16	L-117
APX20LLL		M20	20	L-138

3. Intended use

Generic type:	Torque controlled expansion anchor throughtbolt type
Base material:	Concrete C20/25 to C50/60 according to EN 206-1
Material:	Made of steel, zinc plated ISO 4042 A2
Durability:	Internal dry conditions
Loading:	Static, quasi static loads
Fire resistance:	F120
Seismic category	C1 and C2
Assumed working life:	50 years

4. Manufacturer: Index Fixing Systems. Técnicas Expansivas S.L.
Segador, 13
26006 Logroño, La Rioja, SPAIN

5. Authorized representative: No applicable

6. System of assessment of performance: 1

7. Harmonized standard: No applicable

8. European technical assessment:

Technical assessment body:	IETcc; Instituto Eduardo Torroja de ciencias de la construcción. Notified body 1219.
Issued:	ETA 12/0397
On the basis of:	EAD 330232-00-0601
Performed:	Determination of product type, initial inspection of the manufacturing plant and continuous surveillance of FPC
Under system:	1
Issued:	Certificate CE 1219-CPR-0053

9. Declared performances: Mechanical anchor for structural applications in concrete

Essential characteristics			Performance				
			M8	M10	M12	M16	M20
Installation parameters							
d_o	Nominal diameter of drill bit:	[mm]	8	10	12	16	20
h_{ef}	Effective embedment depth:	[mm]	48	60	70	85	100
d_f	Fixture clearance hole diameter:	[mm]	9	12	14	18	22
T_{inst}	Nominal installation torque:	[Nm]	15	40	60	100	200
h_1	Depth of drilled hole:	[mm]	60	75	85	105	125
h_{nom}	Minimum installation depth:	[mm]	55	68	80	97	114
h_{min}	Minimum thickness of concrete member:	[mm]	100	120	140	170	200
s_{min}	Minimum spacing:	[mm]	50	60	70	128	150
c_{min}	Minimum edge distance:	[mm]	50	60	70	128	150
Tension load: steel failure							
$N_{Rk,s}$	Tension steel characteristic resistance:	[kN]	18.1	31.4	40.4	72.7	116.6
γ_{Ms}	Partial safety factor:	[-]	1.5	1.5	1.5	1.5	1.5
Tension load: pull-out failure in concrete							
$N_{Rk,p,ucr}$	Tension characteristic resistance in C20/25 uncracked concrete:	[kN]	9	16	25	35	50
$N_{Rk,p,cr}$	Tension characteristic resistance in C20/25 cracked concrete:	[kN]	6	9	16	25	30
γ_{ins} [1] γ_2 [2]	Partial safety factor:	[-]	1.2	1.0	1.0	1.0	1.0
ψ_c	C30/37	[-]	1.22	1.16	1.22	1.22	1.16
ψ_c	C40/45	[-]	1.41	1.31	1.41	1.41	1.31
ψ_c	C50/60	[-]	1.55	1.41	1.55	1.55	1.41
Tension load: concrete cone or splitting failure in concrete							
h_{ef}	Effective embedment depth:	[mm]	48	60	70	85	100
$k_1=k_{ucr,N}$ [1]	Factor for uncracked concrete:	[-]	11.0	11.0	11.0	11.0	11.0
$k_1=k_{cr,N}$ [1]	Factor for cracked concrete:	[-]	7.7	7.7	7.7	7.7	7.7
k_1 [2]	Factor for uncracked concrete:	[-]	10.1	10.1	10.1	10.1	10.1
k_1 [2]	Factor for cracked concrete:	[-]	7.2	7.2	7.2	7.2	7.2
γ_{ins} [1] γ_2 [2]	Partial safety factor:	[-]	1.2	1.0	1.0	1.0	1.0
$s_{cr,N}$	Critical spacing:	[mm]	144	180	210	384	450
$s_{cr,sp}$	Critical spacing (splitting):	[mm]	288	300	350	510	600
$c_{cr,N}$	Critical edge distance:	[mm]	72	90	105	192	225
$c_{cr,sp}$	Critical edge distance (splitting):	[mm]	144	150	175	255	300
Displacements under tension loads							
N	Service tension load:	[kN]	2.5	4.3	7.6	11.9	14.3
δ_{N0}	Short term displacement under tension loads:	[mm]	1.0	1.1	0.9	1.5	1.3
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1.6	1.6	1.6	1.6	1.6
Shear load: steel failure without lever arm							
$V_{Rk,s}$	Characteristic resistance:	[kN]	11.0	17.4	25.3	47.1	73.1
k_2 [1]	k_2 factor:	[-]	1.0	1.0	1.0	1.0	1.0
k_7 [2]	k_7 factor:	[-]	1.0	1.0	1.0	1.0	1.0
γ_{Ms}	Partial safety factor:	[-]	1.25	1.25	1.25	1.25	1.25
Shear load: steel failure with lever arm							
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	22.5	44.8	78.6	199.8	389.4
γ_{Ms}	Partial safety factor:	[-]	1.25	1.25	1.25	1.25	1.25

Essential characteristics			Performance				
			M8	M10	M12	M16	M20
Shear load: concrete pryout failure							
k_3 [1] = k_8 [2] k [3]	k factor:	[-]	1	2	2	2	2
γ_{ins} [1] [2] γ_2 [3]	Installation safety factor:	[-]	1.0	1.0	1.0	1.0	1.0
Shear load: concrete edge failure							
l_f	Effective length of anchor under shear loads:	[mm]	48	60	70	85	100
d_{nom}	Outside anchor diameter:	[mm]	8	10	12	16	20
γ_{ins} [1] [2] γ_2 [3]	Installation safety factor:	[-]	1.5	1.5	1.5	1.5	1.5
Displacements under shear loads							
V	Service shear load:	[kN]	4.9	6.8	8.5	15.1	24.6
δ_{V0}	Short term displacement:	[mm]	1.0	1.5	1.8	1.9	3.1
$\delta_{V\infty}$	Long term displacement:	[mm]	1.5	2.3	2.7	2.9	4.7

[1] Parameter relevant only for design according to CEN/TS 1992-4:2009
[2] Parameter relevant only for design according to prEN 1992-4
[3] Parameter relevant only for design according to ETAG 001, Annex C

Information for seismic design seismic category C1			Performance				
			M8	M10	M12	M16	M20
Steel failure for tension and shear failure							
$N_{Rk,s,seis}$	Characteristic tension steel failure:	[kN]	--	31.4	40.4	72.7	116.6
$\gamma_{Ms,N}$	Partial safety factor:	[-]	--	1.5	1.5	1.5	1.5
$V_{Rk,p,seis}$	Characteristic shear steel failure:	[kN]	--	12.2	17.8	33.0	58.5
$\gamma_{Ms,V}$	Partial safety factor:	[-]	--	1.25	1.25	1.25	1.25
Pull out failure							
$N_{Rk,p,seis}$	Characteristic pull out failure:	[kN]	--	3.9	16.0	25.0	30.0
Concrete cone failure							
h_{ef}	Effective embedment depth:	[mm]	--	60	70	85	100
$s_{cr,N}$	Spacing:	[mm]	--	180	210	384	450
$c_{cr,N}$	Edge distance:	[mm]	--	90	105	192	225
γ_{ins} [1] γ_2 [2]	Installation safety factor:	[-]	--	1.0	1.0	1.0	1.0
Concrete pryout failure							
k_3 [1] k [2]	k factor:	[-]	--	2	2	2	2
Concrete edge failure							
l_f	Effective length of anchor:	[mm]	--	60	70	85	100
d_{nom}	Outside anchor diameter:	[mm]	--	10	12	16	20

Information for seismic design seismic category C2			Performance				
			M8	M10	M12	M16	M20
Steel failure for tension and shear failure							
$N_{Rk,s,seis}$	Characteristic tension steel failure:	[kN]	--	--	40.4	--	116.6
$\gamma_{Ms,N}$	Partial safety factor:	[-]	--	--	1.5	--	1.5
$V_{Rk,p,seis}$	Characteristic shear steel failure:	[kN]	--	--	17.8	--	58.5
$\gamma_{Ms,V}$	Partial safety factor:	[-]	--	--	1.25	--	1.25
Pull out failure							
$N_{Rk,p,seis}$	Characteristic pull out failure:	[kN]	--	--	5.2	--	21.0
Concrete cone failure							
h_{ef}	Effective embedment depth:	[mm]	--	--	70	--	100
$s_{cr,N}$	Spacing:	[mm]	--	--	210	--	450
$c_{cr,N}$	Edge distance:	[mm]	--	--	105	--	225
γ_{ins} [1] γ_2 [2]	Installation safety factor:	[-]	--	--	1.0	--	1.0
Concrete pryout failure							
k_3 [1] k [2]	k factor:	[-]	--	--	2	--	2
Concrete edge failure							
l_f	Effective length of anchor:	[mm]	--	--	70	--	100
d_{nom}	Outside anchor diameter:	[mm]	--	--	12	--	20

Information for seismic design seismic category C2			Performance				
			M8	M10	M12	M16	M20
Concrete cone failure							
$\delta_{N,seis\ (DLS)}$	Displacement Damage Limitation State[3) 4)]:	[mm]	--	--	2.34	--	6.82
$\delta_{V\ seis\ (DLS)}$	Displacement Damage Limitation State[3) 4)]:	[mm]	--	--	5.53	--	6.37
$\delta_{N,seis\ (ULS)}$	Displacement Ultimate Limit State [3)]:	[mm]	--	--	9.54	--	29.12
$\delta_{V,seis\ (ULS)}$	Displacement Ultimate Limit State [3)]:	[mm]	--	--	9.08	--	12.32

[1)] Parameter relevant only for design according to CEN/TS 1992-4:2009, prEN 1992-4

[2)] Parameter relevant only for design according to ETAG 001, Annex C

[3)] The listed displacements represent mean values

[4)] A small displacement may be required in the design in the case of displacements sensitive fastening of "rigid" supports. The characteristics resistance associated with such small displacements may be determined by linear interpolation or proportional reduction.

Characteristic values for resistance to fire			Performance				
			M8	M10	M12	M16	M20
Steel failure							
$N_{Rk,s,fi,30}$	Characteristic tension resistance, R30:	[kN]	0,4	0,9	1,7	3,1	4,9
$N_{Rk,s,fi,60}$	Characteristic tension resistance, R60:	[kN]	0,3	0,8	1,3	2,4	3,7
$N_{Rk,s,fi,90}$	Characteristic tension resistance, R90:	[kN]	0,3	0,6	1,1	2,0	3,2
$N_{Rk,s,fi,120}$	Characteristic tension resistance, R120:	[kN]	0,2	0,5	0,8	1,6	2,5
$V_{Rk,s,fi,30}$	Characteristic shear resistance, R30:	[kN]	0,4	0,9	1,7	3,1	4,9
$V_{Rk,s,fi,60}$	Characteristic shear resistance, R60:	[kN]	0,3	0,8	1,3	2,4	3,7
$V_{Rk,s,fi,90}$	Characteristic shear resistance, R90:	[kN]	0,3	0,6	1,1	2,0	3,2
$V_{Rk,s,fi,120}$	Characteristic shear resistance, R120:	[kN]	0,2	0,5	0,8	1,6	2,5
$M^0_{Rk,s,fi,30}$	Characteristic bending resistance, R30:	[kN]	0,4	1,1	2,6	6,7	13,0
$M^0_{Rk,s,fi,60}$	Characteristic bending resistance, R60:	[kN]	0,3	1,0	2,0	5,0	9,7
$M^0_{Rk,s,fi,90}$	Characteristic bending resistance, R90:	[kN]	0,3	0,7	1,7	4,3	8,4
$M^0_{Rk,s,fi,120}$	Characteristic bending resistance, R120:	[kN]	0,2	0,6	1,3	3,3	6,5
Pull out failure							
$N_{Rk,p,fi,30}$	Characteristic resistance, R30:	[kN]	1,3[3)]	2,3	3,0[3)]	6,3	7,5
$N_{Rk,p,fi,60}$	Characteristic resistance, R60:	[kN]	1,3[3)]	2,3	3,0[3)]	6,3	7,5
$N_{Rk,p,fi,90}$	Characteristic resistance, R90:	[kN]	1,3[3)]	2,3	3,0[3)]	6,3	7,5
$N_{Rk,p,fi,120}$	Characteristic resistance, R120:	[kN]	1,0[3)]	1,8	2,4[3)]	5,0	6,0
Concrete cone failure [4)]							
$N_{Rk,p,fi,30}$	Characteristic resistance, R30:	[kN]	2.9	5,0	7,4	12,0	18,0
$N_{Rk,p,fi,60}$	Characteristic resistance, R60:	[kN]	2.9	5,0	7,4	12,0	18,0
$N_{Rk,p,fi,90}$	Characteristic resistance, R90:	[kN]	2.9	5,0	7,4	12,0	18,0
$N_{Rk,p,fi,120}$	Characteristic resistance, R120:	[kN]	2,3	4,0	5,9	9,6	14,4
$s_{cr.N,fi}$	Critical spacing, from R30 to R120:	[mm]	4 x h_{ef}	4 x h_{ef}	4 x h_{ef}	4 x h_{ef}	4 x h_{ef}
$s_{min,fi}$	Minimum spacing, from R30 to R120:	[mm]	50	60	70	128[3)]	150[3)]
$c_{cr.N,fi}$	Critical edge distance, from R30 to R120:	[mm]	2 x h_{ef}	2 x h_{ef}	2 x h_{ef}	2 x h_{ef}	2 x h_{ef}
$c_{min,fi}$	Minimum edge distance, from R30 to R120:	[mm]	c_{min} = 2 x h_{ef}; si el ataque de fuego proviene de más de una cara, la distancia del anclaje al borde tiene que ser ≥ 300 mm y ≥ 2 x h_{ef}				
Concrete pry out failure							
$k_3=k_8$[1)] k[2)]	K factor:	[-]	1	2	2	2	2

[1)] Parameter relevant only for design according to CEN/TS 1992-4:2009, prEN 1992-4

[2)] Parameter relevant only for design according to ETAG 001, Annex C

[3)] The listed displacements represent mean values

[4)] A small displacement may be required in the design in the case of displacements sensitive fastening of "rigid" supports. The characteristics resistance associated with such small displacements may be determined by linear interpolation or proportional reduction.

10. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed on behalf of the manufacturer by:

Santiago Reig. Technical Manager
Logroño, 12.03.2018