Declaration of Performance
DoP THDEX-en

1. Product type: THDEX, THDAV Cloverfix concrete screw anchor

2. Identification:

Product code	Length L [mm]	Outer diameter [mm]	Fixture thickness [mm]
THDEX07LLL	3 last digits of product code	7.5	L-55
THDEX10LLL		10.5	L-60
THDEX12LLL		12.5	L-70
THDEX16LLL		16.5	L-110
THDAV07LLL		7.5	L-55

3. Intended use:

Generic type: Concrete screw anchor
Base material: Concrete C20/25 to C50/60 according to EN 206-1.
Material: Made of carbon steel, silver ruspert coated
Durability: Internal dry conditions
Loading: Static, quasi static loads
Fire resistance: F120
Assumed working life: 50 years

4. Manufacturer:
Cloverfix Fixing Systems. Técnicas Expansivas S.L.
Río Escalón, 1
26006 Logroño, La Rioja, SPAIN

5. Authorised representative: Not applicable

6. System of assessment of performance: 1

7. Harmonised standard: Not applicable

8. European technical assessment

Tech. assessment body: IETcc: Instituto Eduardo Torroja de ciencias de la construcción. Notified body 1219.
issued: ETA 15/0017
on the basis of: ETAG 001, parts 1, 3, TR020.
performed: Determination of product type, initial inspection of the manufacturing plant and continuous surveillance of FPC.
under system: 1
and issued: Certificate 1219-CPR-0091

9. Declared performances:

Basic requirements on works			Performance				Technical specification
			7,5	10,5	12,5	16,5	
Installation parameters							ETAG001 p1/3
d_0	Nominal diameter of drill bit:	[mm]	6	8	10	14	
d_f	Diameter of clearance hole in fixture:	[mm]	9	12	14	18	
d_s	Outer diameter of the thread	[mm]	7.5	10.5	12.5	16.5	
L_{min}	Total length of the anchor	[mm]	60	65	75	115	
L_{max}		[mm]	400	400	400	400	
h_{min}	Minimum thickness of concrete member:	[mm]	100	100	105	175	
h_1	Depth of drilled hole:	[mm]	65	70	85	130	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	55	60	70	110	
h_{ef}	Effective anchorage depth:	[mm]	42	45	52	86	
T_{ins}	Installation torque	[Nm]	20	50	80	120	
t_{fix}	Thickness of fixture	[mm]	L-55	L-60	L-70	L-110	
s_{min}	Minimum allowable spacing:	[mm]	45	50	60	100	
c_{min}	Minimum allowable edge distance:	[mm]	45	50	60	100	
Tension load: steel failure							ETAG001 p1/3
$N_{Rk,s}$	Tension steel characteristic resistance:	[kN]	18.7	32.7	51.2	115.9	
γ_{Ms}	Partial safety factor:	[-]	1.5	1.5	1.5	1.5	
Tension load: pull-out failure in concrete							ETAG001 p1/3
$N_{Rk,p,ucr}$	Tension characteristic resistance in C20/25 uncracked concrete:	[kN]	9	12	20	40	
$\psi_{c,ucr}$	C30/37	[-]	1,22	1,08	1,04	1,04	
$\psi_{c,ucr}$	C40/45	[-]	1,41	1,15	1,07	1,07	
$\psi_{c,ucr}$	C50/60	[-]	1,55	1,19	1,09	1,09	
$N_{Rk,p,cr}$	Tension characteristic resistance in C20/25 cracked concrete:	[kN]	6	9	12	30	
$\psi_{c,cr}$	C30/37	[-]	1,22	1,22	1,22	1,12	
$\psi_{c,cr}$	C40/45	[-]	1,41	1,41	1,41	1,23	
$\psi_{c,cr}$	C50/60	[-]	1,55	1,55	1,55	1,30	
γ_{Mp}	Partial safety factor: [)]	[-]	1.8	1.8	1.8	1.5	
Tension load: concrete cone or splitting failure in concrete C20/25							ETAG001 p1/3
h_{ef}	Effective embedment depth:	[mm]	42	45	52	86	
γ_{Mc}	Partial safety factor: [)]	[-]	1.8	1.8	1.8	1.5	
$s_{cr,N}$	Critical spacing:	[mm]	126	135	156	258	
$c_{cr,N}$	Critical edge distance:	[mm]	63	67	78	129	
$s_{cr,sp}$	Critical spacing (splitting):	[mm]	126	135	177	292	
$c_{cr,sp}$	Critical edge distance (splitting):	[mm]	63	67	88	146	
γ_{Msp}	Partial safety factor: [)]	[-]	1.8	1.8	1.8	1.5	
Displacements under tension loads							ETAG001 p1/3
N	Service tension load in uncracked concrete C20/25 to C50/60:	[kN]	3.6	4.8	9.5	19.0	
δ_{N0}	Short term displacement under tension loads:	[mm]	0.4	0.4	0.4	0.9	
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1.0	1.1	1.4	1.4	
N	Service tension load in cracked concrete C20/25 to C50/60:	[kN]	2.4	3.6	5.7	11.9	
δ_{N0}	Short term displacement under tension loads:	[mm]	0.6	0.7	0.5	0.6	
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1.4	1.2	1.4	1.2	
Shear load: steel failure							ETAG001 p1/3
$V_{Rk,s}$	Shear steel characteristic resistance:	[kN]	7.5	16.3	35.6	57.9	
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	15.2	35.3	69.3	235.9	
γ_{Ms}	Partial safety factor:	[-]	1.25	1.25	1.25	1.25	
Shear load: concrete pryout failure							ETAG001 p1/3
K	K factor:	[-]	1	1	1	2	
γ_{Mpr}	Partial safety factor:	[-]	1.5	1.5	1.5	1.5	
Shear load: concrete edge failure							ETAG001 p1/3
l_f	Effective anchorage depth under shear loads:	[mm]	42	45	52	86	
d_{nom}	Outside anchor diameter:	[mm]	7.5	10.5	12.5	16.5	
γ_{Mc}	Partial safety factor:	[-]	1.5	1.5	1.5	1.5	
Displacements under shear loads							ETAG001,p1/3
V	Service shear load in cracked and uncracked concrete C20/25 to C50/60:	[kN]	3.0	6.5	12.2	27.6	
δ_{V0}	Short term displacement under shear loads:	[mm]	1.3	1.4	1.8	2.3	
$\delta_{V\infty}$	Long term displacement under shear loads:	[mm]	2.0	2.1	2.7	3.5	

*) In absence of other national regulations

Fire resistance. Applicable technical specification: EOTA Technical Report 020

Reaction to fire		7.5	10.5	12.5	16.5
Reaction to fire	[--]		Class A1		

Fire resistance duration = 30 minutes		7.5	10.5	12.5	16.5
Tension loads steel failure					
$N_{Rk,s,fi,30}$ Characteristic resistance	[kN]	0.23	0.61	1.28	2.90
Pull-out failure					
$N_{Rk,p,fi,30}$ Character. resistance in concrete C20/25 to C50/60	[kN]	1.50	2.25	3.00	7.50
Concrete cone failure *)**					
$N_{Rk,c,fi,30}$ Character. resistance in concrete C20/25 to C50/60	[kN]	2.06	2.45	3.51	12.35
Shear loads steel failure without lever arm					
$V_{Rk,s,fi,30}$ Characteristic resistance	[kN]	0.23	0.61	1.28	2.90
Shear loads steel failure with lever arm					
$M_{Rk,s,fi,30}$ Characteristic bending resistance	[Nm]	0.19	0.66	1.73	5.90

Fire resistance duration = 60 minutes		7.5	10.5	12.5	16.5
Tension loads steel failure					
$N_{Rk,s,fi,60}$ Characteristic resistance	[kN]	0.21	0.53	0.96	2.17
Pull-out failure					
$N_{Rk,p,fi,60}$ Character. resistance in concrete C20/25 to C50/60	[kN]	1.50	2.25	3.00	7.50
Concrete cone failure **)					
$N_{Rk,c,fi,60}$ Character. resistance in concrete C20/25 to C50/60	[kN]	2.06	2.45	3.51	12.35
Shear loads, steel failure without lever arm					
$V_{Rk,s,fi,60}$ Characteristic resistance	[kN]	0.21	0.53	0.96	
Shear loads, steel failure with lever arm					
$M_{Rk,s,fi,60}$ Characteristic bending resistance	[Nm]	0.17	0.57	1.30	4.42

Fire resistance duration = 90 minutes		7.5	10.5	12.5	16.5
Tension loads steel failure					
$N_{Rk,s,fi,90}$ Characteristic resistance	[kN]	0.16	0.41	0.83	1.88
Pull-out failure					
$N_{Rk,p,fi,90}$ Character. resistance in concrete C20/25 to C50/60	[kN]	1.50	2.25	3.00	7.50
Concrete cone failure **)					
$N_{Rk,c,fi,90}$ Character. resistance in concrete C20/25 to C50/60	[kN]	2.06	2.45	3.51	12.35
Shear loads, steel failure without lever arm					
$V_{Rk,s,fi,90}$ Characteristic resistance	[kN]	0.16	0.41	0.83	
Shear loads, steel failure with lever arm					
$M_{Rk,s,fi,90}$ Characteristic bending resistance	[Nm]	0.13	0.44	1.13	3.83

Fire resistance duration = 120 minutes		7.5	10.5	12.5	16.5
Tension loads steel failure					
$N_{Rk,s,fi,120}$ Characteristic resistance	[kN]	0.12	0.33	0.64	1.45
Pull-out failure					
$N_{Rk,p,fi,120}$ Character. resistance in concrete C20/25 to C50/60	[kN]	1,20	1.80	2.40	6.00
Concrete cone failure **)					
$N_{Rk,c,fi,120}$ Character. resistance in concrete C20/25 to C50/60	[kN]	1.65	1.96	2.81	9.88
Shear loads, steel failure without lever arm					
$V_{Rk,s,fi,120}$ Characteristic resistance	[kN]	0.12	0.33	0.64	
Shear loads, steel failure with lever arm					
$M_{Rk,s,fi,120}$ Characteristic bending resistance	[Nm]	0.10	0.35	0.87	2.95

Spacing and minimum edge distance		7.5	10.5	12.5	16.5
$S_{cr,N}$ Spacing	[mm]	168	180	208	344
S_{min} Minimum spacing	[mm]	45	50	60	100
$C_{cr,N}$ Edge distance	[mm]	84	90	104	172
C_{min} Minimum edge distance (one side fire)	[mm]	84	90	104	172
C_{min} Minimum edge distance (two sides fire)	[mm]	300	300	300	300
γ_{Msp} Partial safety factor *)	[-]	1.0	1.0	1.0	1.0

**)   In absence of other national regulations
***)   As a rule, splitting failure can be neglected when cracked concrete and reinforcement is assumed.

Concrete pry-out failure		7.5	10.5	12.5	16.5
K factor	[--]	1	1	1	2
In Eq. (5.6) of ETAG 001 Annex C, 5.2.2.3, these values of k factor and the relevant values of $N_{Rk,c,fi}$ given in the above tables have to be considered in the design.					

Concrete edge failure
The characteristic resistance $V^0_{RK,c,fi}$ in C20/25 to C50/60 concrete is determined by: $V^0_{RK,c,fi} = 0,25 \times V^0_{RK,c}$ (≤ R90) and $V^0_{RK,c,fi} = 0,20 \times V^0_{RK,c}$ (R120) With $V^0_{RK,c}$ initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature according to ETAG 001, Annex C, 5.2.3.4.

10. The performance of the product identified in points 1 and 2 is in conformity with the declared performanc
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, 20.03.2018