Tecfi S.p.A. - Fixing Systems
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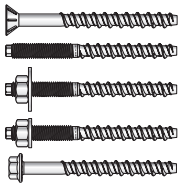
ISO 9001
ISO 14001

Declaration of Performance No1109-CPD-0079

According to the Regulation EU No 305/2011

HXE01 - HXE02 - HXE12 - HXE85 - HXE03

Manufacturer: Tecfi S.p.A. - S.S. Appia, km 193 - 81050 Pastorano (CE), Italia



1 - Intended use

Product-type:	Metal anchor for use in concrete
Anchor type:	Undercut anchor for use in concrete under static, quasi-static or seismic action (performance category C1 and C2)
Technical description of the product:	see Table 2.a
Specification of the intended use in accordance with the applicable EAD:	The performances given in Table 4 are only valid if the anchor is used in compliance with the specifications and conditions given in the Table 3.
Base material:	Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206-1.
Installation:	Hole drilling by rotary plus hammer mode: Ø8, Ø 10, Ø 12, Ø 16 In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of the load application. After installation further turning of the anchor is not possible.
Loading:	- Static and quasi-static loads: sizes from Ø 8 to Ø 16. - Seismic loads performance category C1 and C2: size Ø 12 and Ø16 - Seismic loads performance category C1: size Ø 10
Durability:	The anchor may be used in structures subject to dry internal conditions only. The verifications and assessment methods on which the relevant European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.
Service temperature:	The anchors may be used in the following temperature range: [-40°C ; +80°C]
Resistance to fire:	See tables 4
Reaction to fire:	The anchor is classified A1 according to EC Decision 96/603/EC.
European Assessment Document:	European Assessment Document (EAD) 330232-00-0601
European Technical Assessment:	ETA 11/0336
Technical Assessment Body:	Deutsches Institut für Bautechnik, Kolonnenstr. 30 B, 10829 Berlin, GERMANY
Design methods:	- Static and quasi-static load: TAG001, Annex C, design method A, Edition August 2010 or CEN/TS 1992-4:2009. - Seismic load: EOTA Technical Report TR045(February 2013).
Assessment and Verification of Constancy of Performance:	EC Certificate No. 1109-CPD-0079
Notified Body:	IFBT GmbH, Hans-Weigel-Straße 2b, D - 04319 Leipzig, (Germany)
Under the system:	1

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HXE01 - HXE02 - HXE12 - HXE85 - HXE03

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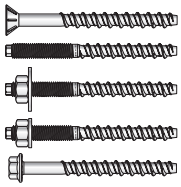
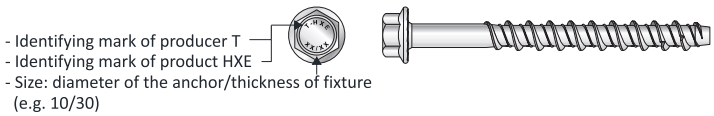
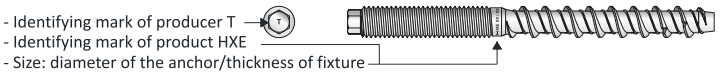


2 - Anchor's types

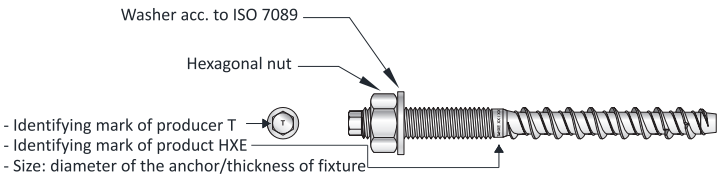
ITEM	Description	f_y [Mpa]	f_u [Mpa]	Finishing
HXE01	Hexagonal flanged washer head screw	640	750	Materials galvanised ≥ 5µm according to ISO 4042
HXE85	Dual thread screw with hexagonal shank			
HXE02	Dual thread screw with hexagonal shank, nut and washer according to ISO 7089			
HXE12	Dual thread screw with hexagonal shank, nut and washer according to ISO 7093			
HXE03	Flat countersunk head with ribs screw			



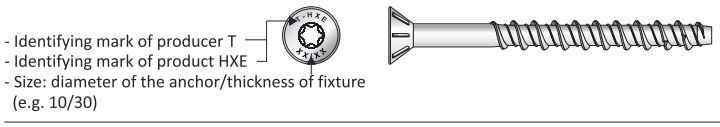
HXE 01



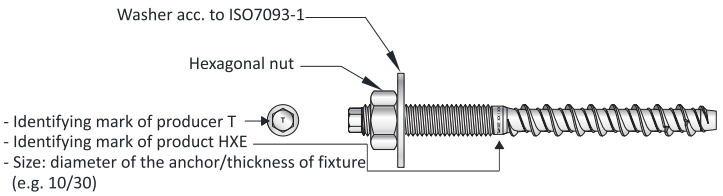
HXE 85



HXE 02



HXE 03



HXE 12

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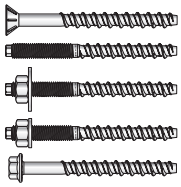
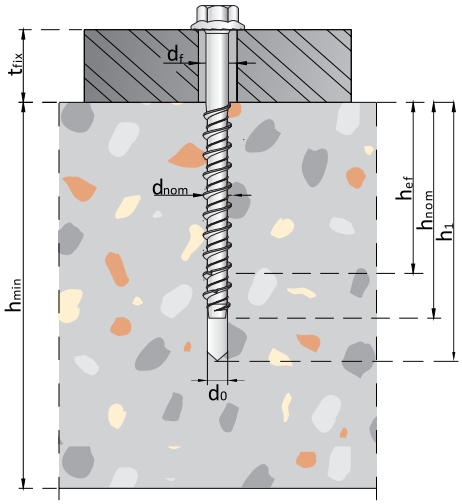


3 - Installation



Static, quasi-static loads and Seismic loads

d_{nom}	Outside diameter of the anchor
d_{cut}	Maximum cutting diameter of the drill bit
t_{fix}	Thickness of the fixtures
d_0	Diameter of the drill hole
d_f	Diameter of the clearance hole in the fixture
h_{min}	Minimum thickness of the concrete member
h_{nom}	Overall anchor embedment depth
h_{ef}	Anchorage depth

3.1 - Installation data valid for all anchor types

Denomination		HXEØ8[1)]	HXEØ10[2)]	HXEØ12[3)]	HXEØ16[4)]
Nominal drill hole diameter	d_o = [mm]	6	8	10	14
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	6.40	8.45	10.45	14.50
Effective anchorage depth	h_{ef} = [mm]	48	56	64	85
Depth of drill hole	h_1 = [mm]	75	85	100	140
Diameter of clearance in the fixture	d_f = [mm]	9	12	14	18
Overall anchor embedment depth in the concrete	h_{nom}=[mm]	60	70	80	110
Minimum thickness of concrete member	h_{min} = [mm]	100	110	130	170
Outside diameter of anchor	d_{nom} = [mm]	8	10	12	16
Minimum edge distance	c_{min} = [mm]	45	50	60	80
Minimum spacing	s_{min} = [mm]	45	50	60	80
Wrench size HXE 02 and HXE 12	SW = [mm]	13	17	19	
Maximum tightening torque of the nut (HXE 02 and HXE 12)	M = [Nm]	20	50	80	
Hexagonal shank size HXE 02 and HXE 12	AF = [mm]	5	7	8	
Six lobe recess HXE 03	T	T30	T40	T50	

1) Setting requires an impact wrench with maximum 20 Nm torque
2) Setting requires an impact wrench with maximum 50 Nm torque
3) Setting requires an impact wrench with maximum 80 Nm torque
4) Setting requires an impact wrench with maximum 160 Nm torque

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Declaration of Performance No1109-CPD-0079

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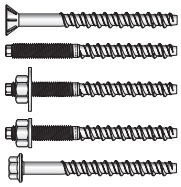
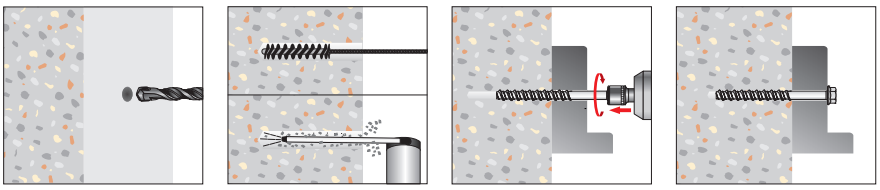
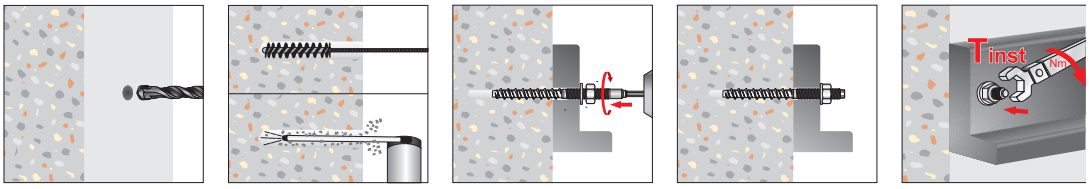
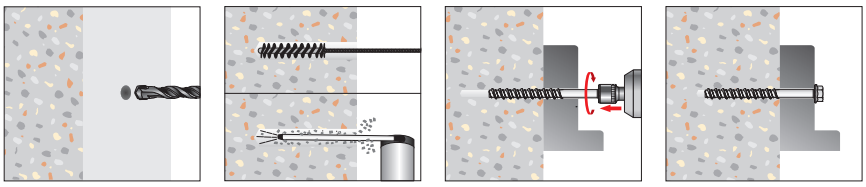


3.2 - Installation

HXE01	
Step 1	Drill a hole into the concrete in rotary plus hammer mode. The hole must be 2 [mm] less than the outside diameter of the anchor
Step 2	Remove the dust into the hole using a brush and a blowing pump
Step 3	Place the fixture
Step 4	Install the anchor using an impact screwdriver
HXE02 **HXE12**	
Step 1	Drill a hole into the concrete in rotary plus hammer mode. The hole must have a diameter 2 [mm] less than the outside diameter of the anchor
Step 2	Remove the dust into the hole using a brush and a blowing pump
Step 3	Place the fixture
Step 4	Install the anchor using an impact screwdriver
Step 5	Tight the nut applying the required torque moment
	[1] Through fixing is allowed (place the fixture before placing the anchor)
HXE03	
Step 1	Drill a hole into the concrete in rotary plus hammer mode. The hole must be 2 [mm] less than the outside diameter of the anchor
Step 2	Remove the dust into the hole using a brush and a blowing pump
Step 3	Place the fixture
Step 4	Install the anchor using an impact screwdriver

3.3 - Tools for installation

Drill bit

size HXE	Drill bit item code
Ø 8	EO 01 06 210
	EOX 01 06 210
Ø 10	EO 01 08 210
	EOX 01 08 210
Ø 12	EO 01 10 210
	EOX 01 10 210
Ø 16	EO 01 14 210
	EOX 01 14 210

Blowing pump

Item code: DW 01 00 001

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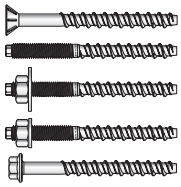

4 - Declared performance according to ETAG001 part 1, part 3 and Annex E

Type of anchor / Size			HXE Ø8	HXE Ø10	HXE Ø12	HXE Ø16
Table 4.a: Steel failure						
Characteristic Resistance for static, quasi-static and seismic action in Performance category C1 and C2	$N_{Rk,s}$ = $N_{rk,s,seis}$	[kN]	20	35	50	95
Partial safety factor	γ_{Ms}	-	1,5			
Table 4.b: Pull-out failure						
Effective embedment depth	h_{ef}	[mm]	48	56	64	85
Characteristic Resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	16	20	25	40
Characteristic Resistance in cracked concrete C20/25			4	7,5	9	16
Characteristic resistance in seismic performance category C1			NPD	6	6,3	16
Characteristic resistance in seismic performance category C2			NPD	NPD	2,7	7,2
Increasing factors for NRk,p for cracked and uncracked concrete	Ψ_c	C30/37	1,22			
		C40/50	1,41			
		C50/60	1,58			
Installation safety factor	γ_2=	-	1,4	1,2	1,4	
Table 4.c: Concrete cone failure and splitting failure						
Effective embedment depth	h_{ef}	[mm]	48	56	64	85
Spacing	$s_{cr,N}$	[mm]	3 x h_{ef}			
Edge distance	$c_{cr,N}$	[mm]	1,5 x h_{ef}			
Spacing (splitting)	$s_{cr,sp}$	[mm]	160	175	195	255
Edge distance (splitting)	$c_{cr,sp}$	[mm]	80	85	95	130
Factor for uncracked concrete	k_{ucr}	-	11,0			
Factor for cracked concrete	k_{cr}	-	7,7			
Table 4.d: Steel failure without level arm						
Characteristic Resistance	$V_{Rk,s}$	[kN]	9,4	20,1	32,4	56,9
Characteristic Resistance in performance category C1		[kN]	NPD	12,1	19,1	39,8
Characteristic Resistance in performance category C2		[kN]	NPD	NPD	17,7	39,8
Partial safety factor	γ_{Ms}	-	1,5			

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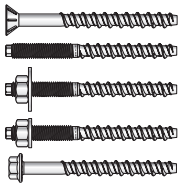

4 - Declared performance according to ETAG001 part 1, part 3 and Annex E

Type of anchor / Size			HXE Ø8	HXE Ø10	HXE Ø12	HXE Ø16
Table 4.e: Steel failure with level arm						
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	19	44	83	216
Ductility factor	k_7		0,8			
Partial safety factor	γ_{Ms}	-	1,5			
Table 4.f: Concrete pryout failure						
Effective embedment depth	h_{ef}	[mm]	48	56	64	85
Factor for pry-out failure	$k = k_8$	-	1		2	
Table 4.g: Concrete edge failure						
Effective anchorage length	h_{ef}	[mm]	48	56	64	85
Effective diameter of the anchor	d	[mm]	6	8	10	14
Table 4.r: Displacement behaviuor						
Service tension load in uncracked concrete C20/25	N_{ucr}	[kN]	7,62	8,89	11,90	13,61
Displacements	$\delta_{N0,u}$	[mm]	0,76	0,74	0,63	0,74
	$\delta_{N0,u}$	[mm]	0,29	0,34	0,23	0,41
Service tension load in cracked concrete C20/25	N_{cr}	[kN]	1,90	4,17	4,29	5,44
Displacements	$\delta_{N0,u}$	[mm]	0,27	0,39	0,45	0,79
	$\delta_{N0,u}$	[mm]	0,53	0,77	0,97	1,05
Service shear load in cracked and uncracked concrete C20/25	V	[kN]	4,50	9,60	15,40	27,10
Displacements	$\delta_{N0,u}$	[mm]	0,94	1,47	1,87	3,00
	$\delta_{N0,u}$	[mm]	1,41	2,20	2,81	4,50
Seismic performance category C2						
Damage limit state – tension load	$\delta_{V0,D}$	[mm]	NPD	NPD	0,16	0,56
Ultimate limit state – tension load	$\delta_{V\infty,}$	[mm]	NPD	NPD	5,65	2,23
Damage limit state – shear load	$\delta_{V0,D}$	[mm]	NPD	NPD	1,02	5,54
Ultimate limit state – shear load	$\delta_{V\infty,}$	[mm]	NPD	NPD	10,08	8,78

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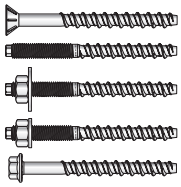

4 - Declared performance according to ETAG001 part 1, part 3 and Annex E

Type of anchor / Size			HXE Ø8	HXE Ø10	HXE Ø12	HXE Ø16
Table 4.h: Duration of fire resistance = 30min						
Steel Failure						
Characteristic Resistance	$N_{Rk,s,fi,30}$	[kN]	0,28	0,73	1,51	2,85
Pull-out failure						
Characteristic Resistance in concrete C20/25 to C50/60	$N_{Rk,s,fi,30}$	[kN]	1,00	1,87	2,25	4,0
Concrete cone failure						
Characteristic Resistance in concrete C20/25 to C50/60	$N_{Rk,s,fi,30}$	[kN]	2,87	4,23	5,90	12,0
Table 4.i: Duration of fire resistance = 60min						
Steel Failure						
Characteristic Resistance	$N_{Rk,s,fi,60}$	[kN]	0,25	0,64	1,13	2,14
Pull-out failure						
Characteristic Resistance in concrete C20/25 to C50/60	$N_{Rk,s,fi,60}$	[kN]	1,00	1,87	2,25	4,0
Concrete cone failure						
Characteristic Resistance in concrete C20/25 to C50/60	$N_{Rk,s,fi,60}$	[kN]	2,87	4,22	5,90	12,0
Table 4.l: Duration of fire resistance = 90min						
Steel Failure						
Resistenza caratteristica	$N_{Rk,s,fi,90}$	[kN]	0,19	0,49	0,98	1,85
Pull-out failure						
Characteristic Resistance in concrete C20/25 to C50/60	$N_{Rk,s,fi,90}$	[kN]	1,00	1,87	2,25	4,0
Concrete cone failure						
Characteristic Resistance in concrete C20/25 to C50/60	$N_{Rk,s,fi,90}$	[kN]	2,87	4,22	5,90	12,0
Table 4.m: Duration of fire resistance =120min						
Steel Failure						
Characteristic Resistance	$N_{Rk,s,fi,120}$	[kN]	0,14	0,39	0,75	1,43
Pull-out failure						
Characteristic Resistance in concrete C20/25 to C50/60	$N_{Rk,s,fi,120}$	[kN]	0,8	1,5	1,8	3,20
Concrete cone failure						
Characteristic Resistance in concrete C20/25 to C50/60	$N_{Rk,s,fi,120}$	[kN]	2,30	3,38	4,72	9,59
Spacing	$s_{cr,N}$	[mm]	$4 \times h_{ef}$			
	s_{min}		45	50	60	80
Edge distance	$c_{cr,N}$		$2 \times h_{ef}$			
	c_{min}		$c_{min} = 2 \times h_{ef}$; If fire attack comes from more than one side, the edge distance of the ≥ 300 mm o ≥ $2 \times h_{ef}$			

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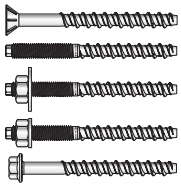

4 - Declared performance according to ETAG001 part 1, part 3 and Annex E

Type of anchor / Size			HXE Ø8	HXE Ø10	HXE Ø12	HXE Ø16
Table 4.n: Duration of fire resistance = 30min						
Characteristic resistance	$V_{Rk,s,fi,30}$	[kN]	0,28	0,73	1,51	2,85
Characteristic bending resistance	$M_{Rk,s,fi,30}$	[Nm]	0,24	0,87	2,22	5,76
Table 4.o: Duration of fire resistance = 60min						
Characteristic resistance	$V_{Rk,s,fi,60}$	[kN]	0,25	0,64	1,13	2,14
Characteristic bending resistance	$M_{Rk,s,fi,60}$	[Nm]	0,22	0,75	1,66	4,32
Table 4.p: Duration of fire resistance = 90min						
Characteristic resistance	$V_{Rk,s,fi,60}$	[kN]	0,19	0,49	0,98	1,85
Resistenza caratteristica alla flessione	$M_{Rk,s,fi,60}$	[Nm]	0,17	0,58	1,44	3,74
Table 4.q: Duration of fire resistance = 120min						
Characteristic resistance	$V_{Rk,s,fi,60}$	[kN]	0,14	0,39	0,75	1,43
Characteristic bending resistance	$M_{Rk,s,fi,60}$	[Nm]	0,12	0,46	1,11	2,88
Concrete pryout failure						
The characteristic resistance $V_{rk,cp,fi,Ri}$ in concrete C20/25 to C50/60 is determined by:						
Factor k	$k = k_3$	-	1	1	2	2
Concrete edge failure						
The characteristic resistance $V_{rk,cp,fi,Ri}$ in concrete C20/25 to C50/60 is determined by **$V^0_{Rk,c,fi(90)} = 0,25 \times V^0_{Rk,c}$** (R30, R60, R90) and **$V^0_{Rk,c,fi(120)} = 0,20 \times V^0_{Rk,c}$** (R120) ith $V^0_{Rk,c}$ as an initial value of the characteristic resistance of a single anchor in cracked concrete C20/25						

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Declaration of Performance No1109-CPD-0079

According to the Regulation EU No 305/2011

HXE01 - HXE02 - HXE12 - HXE85 - HXE03

Manufacturer: Tecfi S.p.A. - S.S. Appia, km 193 - 81050 Pastorano (CE), Italia

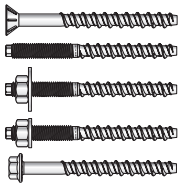

Table 5.a - Item codes		
Item code	**Size ØxL [mm]**	**t_{fix} [mm]**
HXE0108080	8x80	20
HXE0108100	8x100	40
HXE0108120	8x120	60
HXE0108140	8x140	80
HXE0110080	10x80	10
HXE0110100	10x100	30
HXE0110120	10x120	50
HXE0110140	10x140	70
HXE0110160	10x160	90
HXE0112090	12x90	10
HXE0112110	12x110	30
HXE0112130	12x130	50
HXE0112150	12x150	70
HXE0112190	12x190	110
HXE0112210	12x210	130
HXE0112250	12x250	170
HXE0112290	12x290	210
HXE0116130	16x130	20
HXE0116150	16x150	40
HXE0116180	16x180	70
HXE0208090 (HXE12 and HXE85)	8x90	10
HXE0208120 (HXE12 and HXE85)	8x120	40
HXE0208160 (HXE12 and HXE85)	8x160	80
HXE0210105 (HXE12 and HXE85)	10x105	10
HXE0210125 (HXE12 and HXE85)	10x125	30
HXE0210195 (HXE12 and HXE85)	10x195	100
HXE0212118 (HXE12 and HXE85)	12x118	10
HXE0212138 (HXE12 and HXE85)	12x138	30
HXE0212208 (HXE12 and HXE85)	12x208	100
HXE0212248 (HXE12 and HXE85)	12x248	140
HXE0308070	8x70	10
HXE0308100	8x100	40
HXE0308140	8x140	80
HXE0310080	10x80	10
HXE0310100	10x100	30
HXE0310160	10x160	90
HXE0312100	12x100	20
HXE0312120	12x120	40
HXE0312180	12x180	100

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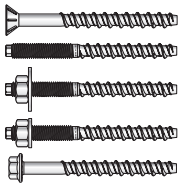
Declaration of Performance No1109-CPD-0079

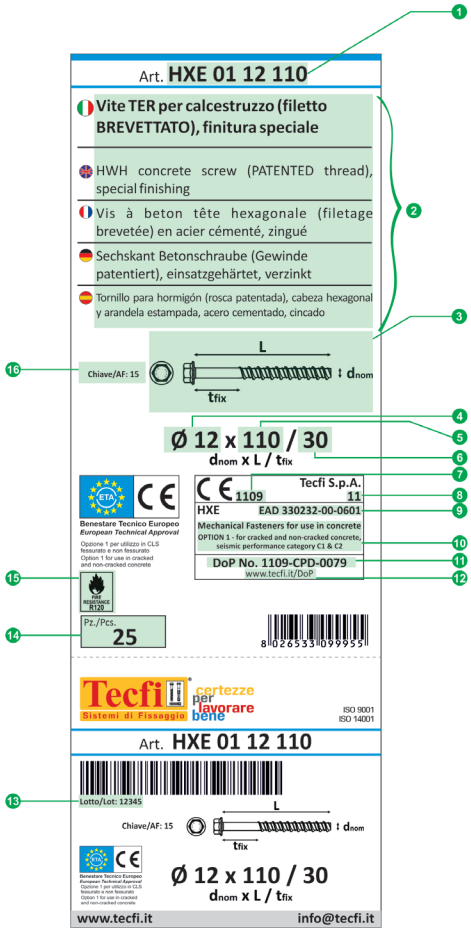
According to the Regulation EU No 305/2011

HXE01 - HXE02 - HXE12 - HXE85 - HXE03

Manufacturer: Tecfi S.p.A. - S.S. Appia, km 193 - 81050 Pastorano (CE), Italia



5 - Label



1. Item Code
2. Descriptions
3. Picture
4. Anchor Diameter (d_{nom})
5. Anchor Length (L)
6. Maximum Thickness of fixture (t_{fix})
7. Identification number of the Notified Body
8. Last two digits of the year in wich the marking was first affixed
9. European Technical Specification
10. Intended use of the product as laid down in the European standard applied, level of performance declared
11. DoP Number
12. Link to DoP
13. Lot Number
14. Number of Pieces per Box
15. Fire Resistance
16. Wrench Size /hexalobular socket number

The performance of the product identified above is in conformity with the set of declared performances. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Name and function	Place and date of issue	Signature
President Antonio Guarino	Pastorano, August 10th 2018	