Tecfi FIXING SYSTEMS

Declaration of Performance n. 2323-CPR-0047

According to the Regulation EU No 305/2011

HLE01

Zinc plated drop-in anchor, with internal and pre-assembled cone, to be hammered with setting tool (item HME01)

Manufacturer: Tecfi S.p.A. - S.S. Appia, km 193 - 81050 Pastorano (CE), Italia - *rdc@tecfi.it*

Name/No DOC: **2323-CPR-0048**
Revision n. **1.00**
Dated **07/02/2024**
Printed on **07/02/2024**

Replaced revision: -
(Dated: -)

1 - Intended use

Product-type:	Mechanical fasteners for use in non-cracked concrete
Anchor type:	Drop in anchor for use in concrete under static and quasi-static loads
Technical description of the product:	see Table 2.a
Specification of the intended use in accordance with the applicable EAD:	- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work. - Verifiable calculation notes and drawings are prepared taking account of the loads to be transmitted. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.). - Anchorages under static and quasi-static loads are designed in accordance with EN 1992-4:2018, design method A. - Anchorages under static and quasi-static loads are designed in accordance with ETAG 001, Annex C, design method C, Edition August 2010. - Fasteners are only to be used for multiple use for non-structural applications acc. to ETAG 001, Part 6, Edition August 2010.
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. - Cracked and non-cracked concrete: sizes M6, M8, M10, M12 and M16.
Installation:	- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site. - Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools. - Check before placing the anchor to ensure that the strength class of the concrete, in which the anchor is to be placed, is identical with the values which the characteristic loads apply. - Check of concrete being well compacted, e.g. without significant voids. - Edge distances and spacings not less than the specified values without minus tolerances. - Positioning of the drill holes without damaging the reinforcement. - 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 drill hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of load application. - Hole shall be clear. - Anchor installation such that the effective anchorage depth is complied with; the compliance is ensured if the thickness of the fixture is not larger than the maximum values given in Annex B2. - Anchor expansion by impact on the wedge of the anchor; the anchor is properly set if the wedge is fully dropped in.
Loading:	- Multiple use for non-structural applications. - Static and wuasi-static loads.
Durability:	The anchors may be used in structures subject to dry internal conditions only.
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 EN 135001-1
European Assessment Document:	European Assessment Document (EAD) 0747
European Technical Assessment:	ETA 19/0239
Technical Assessment Body:	ETA-Danmark A/S Göteborg Plads 1 DK-2150 Nordhavn

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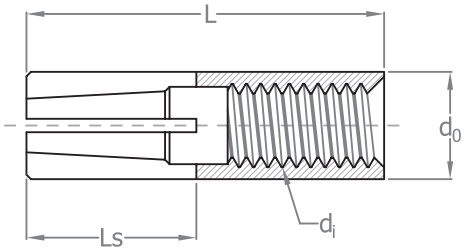
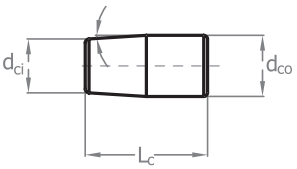
Design methods:	Anchorages in concrete under static or quasi-static actions and under fire exposure are designed in accordance with: - EN 1992-4 Design method A and EOTA Technical report TR055 In case of requirements for resistance to fire exposure it must be ensured that local spalling of the concrete cover does not occur. Anchorages in hollow core slab under static or quasi-static actions are designed in accordance with: - EN 1992-4 Design method B and EOTA Technical report TR055 Anchorages are designed under the responsibility of an engineer experienced in anchorages and cocre-tework. Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the fastener is indicated on the design drawings (e.g. position of the fastener relative to reinforcement or to supports, etc.).
Assessment and Verification of Constancy of Performance:	EC Certificate No. 2323-CPR-0048
Notified Body:	IEA GMBH & Co.KG
Under the system:	2+

2 - Dimensions of the anchor

Diameter inside d_i [mm]	Length L [mm]	Length of expanding section L_S [mm]	Outer diameter d_0 [mm]	Cone length L_C [mm]	Maximum cone diameter d_{CO} [mm]	Minimum cone diameter d_{Ci} [mm]	Angle of cone S_C [°]
M6	24,90 ±0,30	11,60 ±0,60	7,94 ±0,07	10,00 ±0,20	5,05 ±0,05	3,95 ±0,05	5,00 ±0,50
M8	24,90 ±0,30	11,15 ±0,60	9,94 ±0,07	8,15 ±0,30	6,40 ±0,25	5,40 ±0,25	4,50 ±2,00
M8	29,90 ±0,30	13,80 ±0,60	9,94 ±0,07	11,90 ±0,30	6,25 ±0,25	4,50 ±0,25	6,00 ±2,00
M10	24,60 ±0,40	11,60 ±0,60	11,94 ±0,07	8,80 ±0,30	8,30 ±0,25	7,50 ±0,30	3,50 ±2,00
M10	29,60 ±0,40	15,00 ±0,60	11,94 ±0,07	11,90 ±0,30	6,25 ±0,25	4,50 ±0,25	6,00 ±2,00
M10	39,60 ±0,40	18,35 ±0,75	11,94 ±0,07	15,70 ±0,30	7,85 ±0,25	6,30 ±0,30	6,00 ±2,00
M12	24,60 ±0,50	11,20 ±0,75	14,94 ±0,07	10,45 ±0,30	9,80 ±0,25	8,60 ±0,30	7,00 ±2,00
M12	50,50 ±0,50	22,75 ±0,75	14,94 ±0,07	20,70 ±0,30	10,05 ±0,25	8,50 ±0,30	4,00 ±2,00
M16	65,00 ±0,50	29,35 ±0,75	19,80 ±0,20	28,10 ±0,30	13,85 ±0,25	11,70 ±0,30	3,50 ±2,00





2.1 - Materials

Sleeve	Galvanized Cold formed steel: - grade C8C in accordance with EN 10263-2, table 2 *or* - grade 1008 in accordance with ASTM A510, table 3	**Plug**	Galvanized Cold formed steel: - grade C8C in accordance with EN 10263-2, table 2 8,5 *or* - grade 1008 in accordance with ASTM A510, table 3

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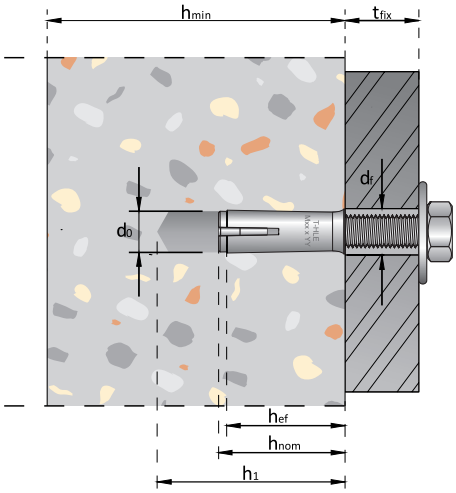
3 - Installation



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

Installation parameters		M6 X 25	M8 X 25	M8 X 30	M10 X 25	M10 X 30	M10 X 40	M12 X 25	M12 X 50	M16 X 65
Drill hole diameter	Ød$_0$ [mm]	8,00	10,00		12,00			15,00		20,00
Maximum cutting diameter of drill bit	Ød$_{cut}$ [mm]	8,45	10,45		12,45			15,50		20,50
Depth of drill hole	h_1 [mm]	25,00	25,00	30,00	25,00	30,00	40,00	25,00	50,00	65,00
Effective embedment depth	h_{ef} [mm]	25,00	25,00	30,00	25,00	30,00	40,00	25,00	50,00	65,00
Setting torque	T_{inst} [Nm]	4,00	8,00		15,00			35,00		60,00
Minimum thickness of concrete member	h_{min} [mm]	100,00	100,00	100,00	100,00	100,00	140,00	100,00	140,00	160,00
Minimum edge distance	C_{min} = [mm]	110,00	50,00	140,00	55,00	60,00	140,00	100,00	140,00	125,00
Minimum spacing	s_{min} = [mm]	120,00	100,00	130,00	110,00	150,00	130,00	200,00	130,00	140,00

3.2 - Tools for installation

Drill bit

size HLE	Drill bit item code
M6	EO 01 08 110
	EOX 41 08 110
M8	EO 01 10 110
	EOX 41 10 110
M10	EO 01 12 160
	EOX 41 12 160
M12	EO 01 15 160
M16	EO 01 20 260
	EOX 41 20 260

Blowing pump

Item code: DW 01 00 001

3.3 - Hand setting tools HME 01

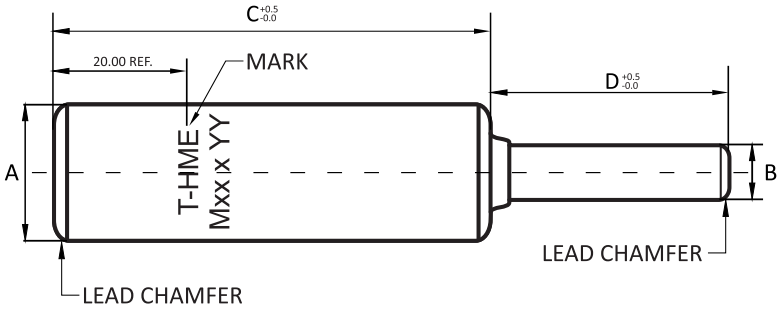


Table A3.1 - Dimensions of hand setting tool HME01

SIZE OF ANCHOR	A	B (ref)	C	D
M6 X 25	Ø 10	Ø 4,70	114,50	15
M8 x 25	Ø 10	Ø 6,35	95,65	16,75
M8 X 30	Ø 10	Ø 6,35	94,50	17,90
M10 X 25	Ø 13	Ø 7,90	108,50	15,80
M10 X 30	Ø 13	Ø 7,90	108,30	16
M10 X 40	Ø 13	Ø 7,90	100,50	23,80
M12 X 25	Ø 16	Ø 9,80	123,50	14,15
M12 X 50	Ø 16	Ø 9,80	107,50	29,70
M16 X 65	Ø 22	Ø 13,50	114,50	36,80

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

Table 4.1: Characteristic tension load values

Performances		M6 X 25	M8 X 25	M8 X 30	M10 X 25	M10 X 30	M10 X 40	M12 X 25	M12 X 50	M16 X 65
Steel failure										
Resistance to steel failure	$N_{Rk,s}$ [kN]	9,92	14,13	14,62	15,24			30,92		49,90
Pull out failure										
Resistance to pull out failure in non craked concrete C20/25	$N_{Rk,p}$ [kN]	2,00	0,90	2,00	1,50	3,00	4,00	2,00	3,50	6,00
Increasing factor for concrete strength	$\Psi_{c30/37}$ [-]	1,14	1,14	1,10	1,18	1,08	1,19	1,18	1,22	1,22
	$\Psi_{c40/50}$ [-]	1,25	1,25	1,18	1,32	1,14	1,34	1,32	1,41	1,41
	$\Psi_{c50/60}$ [-]	1,35	1,35	1,25	1,45	1,19	1,47	1,45	1,55	1,55
Installation safety factor	γ_2 [-]	1,20	1,40	1,20	1,20	1,40	1,20	1,40	1,40	1,00
Concrete cone failure										
Factor for concrete cone failure	$k_{ucr,M}$ [mm]	11,00								
Effective embedment depth	h_{ef} [mm]	25,00	25,00	30,00	25,00	30,00	40,00	25,00	50,00	65,00
Characteristic edge distance	$C_{cr,N}$ [mm]	1,50 x h_{ef}								
Characteristic spacing	$S_{cr,N}$ [mm]	3,00 x h_{ef}								
Installation safety factor	γ_2 [-]	1,20	1,40	1,20	1,20	1,40	1,20	1,40	1,40	1,00
Splitting failure										
Resistance to splitting in non craked concrete C20/25	$N^0_{Rk,sp}$ [kN]	2,00	0,90	2,00	1,50	2,00	4,00	2,00	3,50	6,00
Characteristic edge distance for splitting	$C_{cr,sp}$ [mm]	110,00	60,00	140,00	75,00	90,00	90,00	100,00	140,00	125,00

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Table 4.1: Characteristic tension load values										
Performances		**M6 X 25**	**M8 X 25**	**M8 X 30**	**M10 X 25**	**M10 X 30**	**M10 X 40**	**M12 X 25**	**M12 X 50**	**M16 X 65**
Displacements										
Short time shear displacement	δ_{N0} [mm]	0,10	0,10	0,35	0,14	0,28	0,09	0,31	0,08	0,32
Long-time shear displacement	$\delta_{N\infty}$ [mm]	-	-	-	-	0,40	0,09	-	-	-
Table 4.2: Characteristic shear load values										
Steel failure										
Resistance to steel failure without level arm	$N_{Rk,s}$ [kN]	2,50	4,00	5,00	7,00	6,50	6,00	5,00	7,50	16,00
Resistance to steel failure with level arm	$M^0_{Rk,s}$ [Nm]	18,50	34,70	33,40	46,50			114,00		245,00
Factor for group of fasteners	k_7 [-]	1,00								
Pry out failure										
Factor for pry-out failure	k_8 [-]	1,00								2,00
Displacements										
Short time shear displacement	δ_{V0} [mm]	0,51	0,33	0,61	0,76	1,37	0,45	0,05	0,23	0,38
Long-time shear displacement	$\delta_{V\infty}$ [mm]	0,77	0,50	0,92	1,14	2,06	0,68	0,08	0,35	0,57

Table 4.3: Resistance to fire – tensile load

Performances		M6 X 25	M8 X 25	M8 X 30	M10 X 25	M10 X 30	M10 X 40	M12 X 25	M12 X 50	M16 X 65
Steel failure										
30 minutes fire exposure	$N_{rk,s,fi30}$ [kN]	0,21	0,27		0,50			1,24		2,14
60 minutes fire exposure	$N_{rk,s,fi60}$ [kN]	0,19	0,25		0,43			0,93		1,60
90 minutes fire exposure	$N_{rk,s,fi90}$ [kN]	0,15	0,19		0,33			0,81		1,39
120 minutes fire exposure	$N_{rk,s,fi120}$ [kN]	0,11	0,14		0,27			0,62		1,07
Pull out failure										
30 minutes fire exposure	$N_{rk,p,fi30}$ [kN]	0,50	0,23	0,50	0,38	0,75	1,00	0,50	0,88	1,50
60 minutes fire exposure	$N_{rk,p,fi60}$ [kN]									
90 minutes fire exposure	$N_{rk,p,fi90}$ [kN]									
120 minutes fire exposure	$N_{rk,p,fi120}$ [kN]	0,40	0,18	0,40	0,30	0,60	0,80	0,40	0,70	1,20
Concrete cone failure										
30 minutes fire exposure	$N_{rk,c,fi30}$ [kN]	0,56	0,56	0,89	0,56	0,89	1,82	0,56	3,18	6,13
60 minutes fire exposure	$N_{rk,c,fi60}$ [kN]									
90 minutes fire exposure	$N_{rk,c,fi90}$ [kN]									
120 minutes fire exposure	$N_{rk,c,fi120}$ [kN]	0,45	0,45	0,71	0,45	0,71	1,46	0,45	2,55	4,91
Spacing										
Characteristic spacing in case of fire exposure	$S_{cr,fi}$ [mm]	$4 \times h_{ef}$								
Minimum spacing in case of fire exposure	$S_{min,fi}$ [mm]	100,00	100,00	130,00	110,00	150,00	120,00	200,00	130,00	140,00
Edge distance										
Characteristic edge distance in case of fire exposure	$C_{cr,fi}$ [mm]	$2 \times h_{ef}$								
Minimum edge distance in case of fire exposure	$C_{min,fi}$ [mm]	If fire attack come from one side: $2 \times h_{ef}$ If fire attack come from more than one side: ≥ 300 mm								

Table 4.4: Resistance to fire – shear load

Performances		M6 X 25	M8 X 25	M8 X 30	M10 X 25	M10 X 30	M10 X 40	M12 X 25	M12 X 50	M16 X 65
Steel failure										
30 minutes fire exposure	$V^0_{rk,s,fi30}$ [kN]	0,21	0,27		0,50			1,24		2,14
60 minutes fire exposure	$V^0_{rk,s,fi60}$ [kN]	0,19	0,25		0,43			0,93		1,60
90 minutes fire exposure	$V^0_{rk,s,fi90}$ [kN]	0,15	0,19		0,33			0,81		1,39
120 minutes fire exposure	$V^0_{rk,s,fi120}$ [kN]	0,11	0,14		0,27			0,62		1,07
Steel failure with level arm										
30 minutes fire exposure	$M^0_{rk,s,fi30}$ [kN]	0,40	0,67		1,53			4,59		10,49
60 minutes fire exposure	$M^0_{rk,s,fi60}$ [kN]	0,36	0,60		1,32			3,44		7,87
90 minutes fire exposure	$M^0_{rk,s,fi90}$ [kN]	0,28	0,47		1,02			2,98		6,82
120 minutes fire exposure	$M^0_{rk,s,fi120}$ [kN]	0,20	0,34		0,81			2,29		5,25
Pry out failure										
K factor	$k=k_8$ [mm]	1,00								2,00
30 minutes fire exposure	$N^0_{rk,c,fi30}$ [kN]	0,56	0,56	0,89	0,56	0,89	1,82	0,56	3,18	12,26
60 minutes fire exposure	$N^0_{rk,c,fi60}$ [kN]									
90 minutes fire exposure	$N^0_{rk,c,fi90}$ [kN]									
120 minutes fire exposure	$N^0_{rk,c,fi120}$ [kN]	0,45	0,45	0,71	0,45	0,71	1,46	0,45	2,55	9,81
Concrete edge failure										

The initial value $V^0_{rk,c,fi}$ of the characteristic resistance in concrete C20/25 to C50/60 under fire exposure may be determined by:
$V^0_{rk,c,fi} = 0,25 \times V^0_{rk,c}$ (Fire exposure up to 90 minutes)
$V^0_{rk,c,fi} = 0,20 \times V^0_{rk,c}$ (Fire exposure up to 120 minutes)
With $V^0_{rk,c\ taken}$ as the initial value of the characteristi resistance calculated in case of cracked concrete C20/25 under normal temperature

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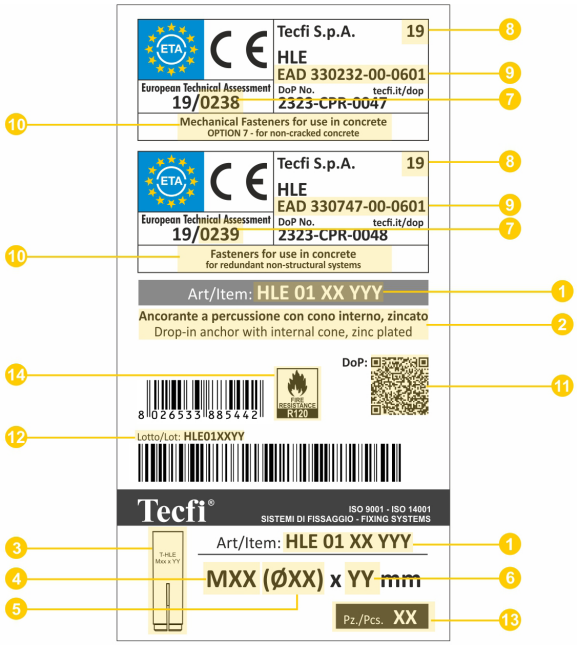
5 - Label



1. Item Code
2. Descriptions
3. Picture
4. Metric thread size (M)
5. Diameter (d)
6. Length (L)
7. Notified test laboratory
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. Link to DoP
12. Lot Number
13. Number of Pieces per Box
14. Fire Resistance

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, July 22th 2019	