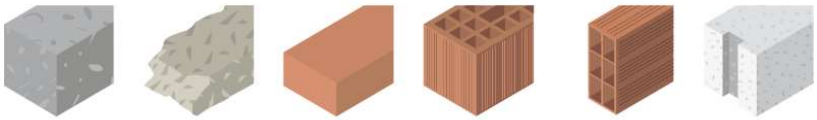
FM-X5

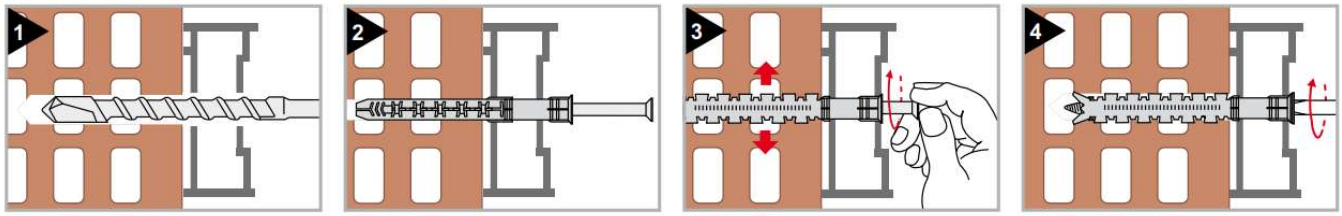
PRODUCT DESCRIPTION

Multi-expansion frame anchor for base material categories: A B C D
Available in options:
Assembled countersunk plug with countersunk head screw, TX 30 or TX40 socket, Screw made of carbon steel class 5,8 (Ø8) and class 6,8 (Ø10), galvanized.
Assembled countersunk plug with special hex head screw with collar Ø19, SW13,TX 40 socket, Screw made of carbon steel class 6,8, galvanized.
Assembled plug with large flange Ø18 with special hex head screw with collar Ø19, SW13,TX 40 socket, Screw made of carbon steel class 6,8, galvanized.

APPLICATION

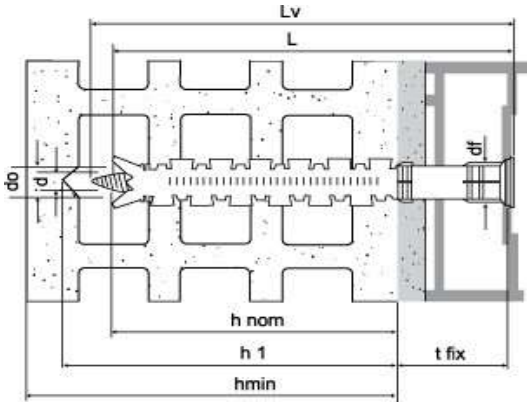
Long plug for window and door frames, barriers, handrails, furniture and interior design fix to substrate category: A B C D acc. to ETAG 020.

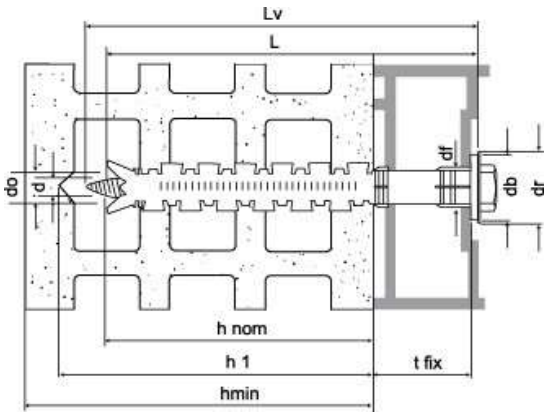




Etanco Sp. z o.o., ul. Olsztyńska 30, 11-130 Orneta
Tel: + 48 55 24 22 926 Fax: + 48 55 24 22 956 e-mail: info@etanco.pl

ANCHOR DIMENSION





tfix – fixture thickness

do – drill hole diameter

h1 – minimum hole depth

hnom – nominal embedment depth

hmin – minimum base material thickness

d – screw diameter

db – flange diameter

df – hole diameter in fixing element

dr – washer diameter

L – anchor length

Lv – screw length

Anchor dimension

Dimension	tfix [mm]	h1 [mm]	hnom [mm]	hmin(1) [mm]	df [mm]	db [mm]	dr [mm]	d [mm]	Lv [mm]	Hex	TX
Ø8x80	10	80	70	120	8,5			6	85		T30
Ø8x100	30	80	70	120	8,5			6	105		T30
Ø8x120	50	80	70	120	8,5			6	125		T30
Ø8x150	80	80	70	120	8,5			6	155		T30
Ø10x85	15	80	70	120	10,5			7	90		T40
Ø10x100	30	80	70	120	10,5			7	105		T40
Ø10x115	45	80	70	120	10,5			7	120		T40
Ø10x135	65	80	70	120	10,5			7	140		T40
Ø10x160	90	80	70	120	10,5			7	165		T40
Ø10x85	15	80	70	120	10,5		19	7	90	13	T40
Ø10x100	30	80	70	120	10,5		19	7	105	13	T40
Ø10x115	45	80	70	120	10,5		19	7	120	13	T40
Ø10x135	65	80	70	120	10,5		19	7	140	13	T40
Ø10x160	90	80	70	120	10,5		19	7	165	13	T40
Ø10x85	15	80	70	120	10,5	18	19	7	90	13	T40
Ø10x100	30	80	70	120	10,5	18	19	7	105	13	T40
Ø10x115	45	80	70	120	10,5	18	19	7	120	13	T40
Ø10x135	65	80	70	120	10,5	18	19	7	140	13	T40
Ø10x160	90	80	70	120	10,5	18	19	7	165	13	T40

(1) *including plaster.*

Etanco Sp. z o.o., ul. Olsztyńska 30, 11-130 Orneta
Tel: + 48 55 24 22 926 Fax: + 48 55 24 22 956 e-mail: info@etanco.pl

EUROPEAN TECHNICAL APPROVAL ETA-10/0425

INSTALATION AND LOADS CHARACTERISTIC						
ESSENTIAL CHARACTERISTICS					**PERFORMANCE**	
Installation parameters					**FM-X5 Ø8**	**FM-X5 Ø10**
d_0	Nominal diameter of drill bit			[mm]	8	10
h_{nom}	Minimum installation depth			[mm]	70	70
h_{min}	Minimum thickness of concrete member C12/15 - C16/20			[mm]	100	100
s_{min}	Minimum spacing C12/15			[mm]	80	80
c_{min}	Minimum edge distance C12/15			[mm]	80	80
$C_{cr,N}$	Characteristic edge distance C12/15			[mm]	140	140
s_{min}	Minimum spacing C16/20			[mm]	60	60
c_{min}	Minimum edge distance C16/20			[mm]	60	60
$C_{cr,N}$	Characteristic Edge distance C16/20			[mm]	100	100
h_{min}	Minimum thickness of the masonry and AAC			[mm]	≥ 106 see under	
s_{min}	Minimum spacing in masonry and AAC – single anchor			[mm]	250	250
c_{min}	Minimum edge distance in masonry and AAC – single anchor			[mm]	100	100
s_{1min}	Spacing perpendicular to free edge in masonry and AAC – anchor group			[mm]	200	200
s_{2min}	Spacing parallel to free edge in masonry and AAC – anchor group			[mm]	400	400
c_{min}	Minimum edge distance in masonry and AAC – anchor group			[mm]	100	100
Characteristic Bending resistance screw in Concrete, masonry and Autoclaved Aerated Concrete (AAC)						
$M_{Rk,s}$	Characteristic bending resistance Galvanized Steel			[Nm]	8,6	16,8
	Characteristic bending resistance Stainless Steel A4-70			[Nm]	13,6	24,8
γ_{Ms} [1)]	Partial safety factor Galvanized Steel			[-]	1,25	
	Partial safety factor Stainless Steel A4-70			[-]	1,56	
Characteristic TENSION Resistance failure of screw for use in concrete						
$N_{Rk,s}$	Tension Steel characteristic failure Galvanized Steel			[kN]	11,0	18,1
	Tension Steel characteristic failure Stainless Steel A4-70			[kN]	16,5	25,0
$\gamma_{ms,N}$ [1)]	Partial safety factor Galvanized Steel			[-]	1,5	
	Partial safety factor Stainless Steel A4-70			[-]	1,9	
Characteristic SHEAR Resistance failure of screw for use in concrete						
$V_{Rk,s}$	Shear Steel characteristic failure Galvanized Steel			[kN]	5,5	9,0
	Shear Steel characteristic failure Stainless Steel A4-70			[kN]	8,2	12,5
$\gamma_{ms,V}$ [1)]	Partial safety factor Galvanized Steel			[-]	1,25	
	Partial safety factor Stainless Steel A4-70			[-]	1,56	
PULL-OUT failure in concrete (plastic anchor)					**FM-X5 Ø8**	**FM-X5 Ø10**
$N_{Rk,p}$	Tension characteristic load in **cracked concrete**	**C12/15**	24°C[2)] / 40°C[3)]	[kN]	1,5	2,5
	Tension characteristic load in **cracked concrete**	**C12/15**	50°C[2)] / 80°C[3)]	[kN]	0,75	1,5
	Tension characteristic load in **cracked concrete**	**≥ C16/20**	24°C[2)] / 40°C[3)]	[kN]	2,5	3,5
	Tension characteristic load in **cracked concrete**	**≥ C16/20**	50°C[2)] / 80°C[3)]	[kN]	1,2	2,5
γ_{mc} [1)]	Partial safety factor			[-]	1,8	

Etanco Sp. z o.o., ul. Olsztyńska 30, 11-130 Orneta
Tel: + 48 55 24 22 926 Fax: + 48 55 24 22 956 e-mail: info@etanco.pl

Displacement under TENSION and SHEAR loading in concrete			FM-X5 Ø8	FM-X5 Ø10
N	Service tension load in concrete **C16/20**	[kN]	1,0	1,4
δ_{N0}	Short term displacement under tension load	[mm]	3,8	1,7
$\delta_{N\infty}$	Long term displacement under tension load	[mm]	7,5	3,6
V	Service shear load in concrete **≥ C16/20**	[kN]	1,0	1,4
δ_{V0}	Short term displacement under shear load	[mm]	1,6	0,9
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	2,4	1,35

[1)] In absence of other national regulations; [2)] Maximum long term temperature; [3)] Maximum short term temperature.

Etanco Sp. z o.o., ul. Olsztyńska 30, 11-130 Orneta
Tel: + 48 55 24 22 926 Fax: + 48 55 24 22 956 e-mail: info@etanco.pl

CHARACTERISTICS RESISTANCE IN MASONRY						
ESSENTIAL CHARACTERISTICS				**PERFORMANCE**		
				FM-X5 Ø8	**FM-X5 Ø10**	
Characteristic Resistance for single anchor in clay Brick fb ≥ 43,8 [MPa] ρ ≥ 1,8 [kg/dm³] h_{min} ≥ 120 mm						
F_{Rk}	Characteristic resistance	24°C[2] / 40° C[3]	[kN]	3,5	3,5	
	Characteristic resistance	50°C[2] / 80° C[3]	[kN]	2,0	2,5	
γ_{Mm} [1]	Partial safety factor		[-]	2,5		
	Drill method		[-]	Hammer drilling		
Characteristic Resistance for single anchor in Hollow clay Brick - BIMATTONE fb ≥ 27,3 [MPa] ρ ≥ 0,9 [kg/dm³] h_{min} ≥ 120 mm						
F_{Rk}	Characteristic resistance	24°C[2] / 40° C[3]	[kN]	1,5	1,5	
	Characteristic resistance	50°C[2] / 80° C[3]	[kN]	0,9	1,2	
γ_{Mm} [1]	Partial safety factor		[-]	2,5		
	Drill method		[-]	Rotary drilling		
Characteristic Resistance for single anchor in Hollow clay Brick - Alveolater Swiss heavy fb ≥ 13,8 [MPa] ρ≥ 0,9 [kg/dm³] h_{min}≥ 250 mm						
F_{Rk}	Characteristic resistance	24°C[2] / 40° C[3]	[kN]	1,5	1,5	
	Characteristic resistance	50°C[2] / 80° C[3]	[kN]	0,6	1,2	
γ_{Mm} [1]	Partial safety factor		[-]	2,5		
	Drill method		[-]	Rotary drilling		
Characteristic Resistance for single anchor in Hollow clay Brick - Alveolater Incastro 35 fb ≥ 10,9 [MPa] ρ ≥ 0,8 [kg/dm³] h_{min} ≥ 350 mm						
F_{Rk}	Characteristic resistance	24°C[2] / 40° C[3]	[kN]	1,5	1,5	
	Characteristic resistance	50°C[2] / 80° C[3]	[kN]	0,75	1,2	
γ_{Mm} [1]	Partial safety factor		[-]	2,5		
	Drill method		[-]	Rotary drilling		
Characteristic Resistance for single anchor in Hollow clay Brick - Leggero fb ≥ 7 [MPa] ρ ≥ 0,5 [kg/dm³] h_{min} ≥ 120 mm						
F_{Rk}	Characteristic resistance	24°C[2] / 40° C[3]	[kN]	0,9	0,9	
	Characteristic resistance	50°C[2] / 80° C[3]	[kN]	0,4	0,6	
γ_{Mm} [4]	Partial safety factor		[-]	2,5		
	Drill method		[-]	Rotary drilling		
Characteristic Resistance for single anchor in Hollow clay Brick - POROTON fb ≥ 22 [MPa] ρ ≥ 0,9 [kg/dm³] h_{min} ≥ 250 mm						
F_{Rk}	Characteristic resistance	24°C[2] / 40° C[3]	[kN]	1,5	2,0	
	Characteristic resistance	50°C[2] / 80° C[3]	[kN]	0,9	1,2	
γ_{Mm} [1]	Partial safety factor		[-]	2,5		
	Drill method		[-]	Rotary drilling		
Characteristic Resistance for single anchor in Hollow clay Brick - LEOPARD BP categ. 1HD fb ≥ 30 [MPa] ρ ≥ 1,3 [kg/dm³] h_{min} ≥106mm						
F_{Rk}	Characteristic resistance	24°C[2] / 40° C[3]	[kN]	2,0	1,5	
	Characteristic resistance	50°C[2] / 80° C[3]	[kN]	0,9	0,9	
γ_{Mm} [1]	Partial safety factor		[-]	2,5		
	Drill method		[-]	Rotary drilling		
Characteristic Resistance for single anchor in Hollow clay Brick - CALCESTRUZZO leggero BC 203 fb ≥ 4 [MPa] ρ ≥ 0,95 [kg/dm³] h_{min} ≥ 200 mm						
F_{Rk}	Characteristic resistance	24°C[2] / 40° C[3]	[kN]	0,75	0,6	
	Characteristic resistance	50°C[2] / 80° C[3]	[kN]	0,3	0,6	
γ_{Mm} [1]	Partial safety factor		[-]	2,5		
	Drill method		[-]	Rotary drilling		
Characteristic Resistance for single anchor in Autoclaved Aerated Concrete (AAC) fb ≥ 2,5 [MPa] ρ ≥ 0,5 [kg/dm³] h_{min} ≥ 200 mm						
F_{Rk}	Characteristic resistance	24°C[2] / 40° C[3]	[kN]	0,6	0,6	
	Characteristic resistance	50°C[2] / 80° C[3]	[kN]	0,6	0,5	
γ_{Mm} [1]	Partial safety factor		[-]	2,0		
	Drill method		[-]	Rotary drilling		

Etanco Sp. z o.o., ul. Olsztyńska 30, 11-130 Orneta
Tel: + 48 55 24 22 926 Fax: + 48 55 24 22 956 e-mail: info@etanco.pl

OTHER FEATURES

Type of anti-corrosion protection	***Galvanized***	***Galvanized***
Plug diameter	*Ø8*	*Ø10*
Screw material	*Carbon steel class 5,8*	*Carbon steel class 6,8*
Plug Material	*Polyamide PA6*	*Polyamide PA6*
Coating thickness	5 µm ISO 4042	5 µm ISO 4042

DOP/DWU

* Acc. to TR 020 $N_{Rd} \leq 0,8$ kN

Etanco Sp. z o.o., ul. Olsztyńska 30, 11-130 Orneta
Tel: + 48 55 24 22 926 Fax: + 48 55 24 22 956 e-mail: info@etanco.pl