Declaration of Performance
DoP MO-H-en

1. Product type — Styrene free hybrid bonded anchor MO-H, MO-HW y MO-HS.

2. Identification

Code	Description
MOH300	Styrene free hybrid bonded anchor 300 ml
MOH 410	Styrene free hybrid bonded anchor 410 ml
MOHW300	Styrene free hybrid bonded anchor fast curing 300 ml
MOHW410	Styrene free hybrid bonded anchor fast curing 410 ml
MOHS300	Styrene free hybrid bonded anchor slow curing 300 ml
MOHS410	Styrene free hybrid bonded anchor slow curing 410 ml

3. Intended use 1

	Generic type:	Chemical anchor for fixings with threaded rods for structural applications in concrete.
	Base material:	Non-cracked concrete from C20/25 to C50/60 according EN 206-1:2008. Suitable for dry, wet and flooded holes.
MO-H MO-HW MO-HS	Material / durability:	a) Carbon galvanized steel class 4.6, 5.8, 8.8 and 10.9 according to EN ISO 898-1 for dry internal conditions. b) Stainless steel A2- 70, A4-70 and A4-80 according to EN ISO 3506 for dry internal conditions, external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions if no particular aggressive conditions exist. c) High corrosion resistant stainless steel 1.4529 and 1.4565class 70 according to EN 10088 for all conditions.
	Loads:	Static or quasi static loads.
	Temperature range:	From -40 ºC to +80 ºC (maximum long term temperature +50 °C; maximum short term temperature +80 °C)
	Fire resistance:	Non declared performance
	Assumed working life:	50 years

Intended use 2	Generic type:	Chemical anchor for fixings with threaded rods for masonry applications
	Base material:	Solid brick, hollow and perforated brick. Mortar strength class for brick joints mortar must be at least M2.5 according to EN 998-2.
MO-H MO-HS	Material / durability:	Carbon galvanized steel class 5.8 according to EN ISO 898-1 with nylon or threaded sleeve for dry internal conditions.
	Loads:	Static or quasi static loads.
	Temperature range:	From -40 ºC to +80 ºC (maximum long term temperature +50 °C; maximum short term temperature +80 °C)
	Fire resistance:	Non declared performance
	Assumed working life:	50 years

	Intended use 3	Generic type:	Chemical anchor for fixings with threaded rods for structural applications in non-carbonated concrete.	
		Base material:	Non-carbonated normal weight concrete of grade C12/15 to C50/60 according to EN 206-1. Dry / wet concrete. Not flooded holes. Bore holes made with hammer drilling or compressed air drilling. Overhead installation allowed.	
	MO-H MO-HW MO-HS	Material / durability:	Straight reinforcing bars with properties according to annex C of classes B are C are recommended. In building components dry surrounding or permanently wet surrounding according to exposure class X0 or XC1 according to EN 1992-1-1.	
		Loads:	Static or quasi static loads.	
		Temperature range:	From -40 ºC to +80 ºC (maximum long term temperature +50 °C; maximum short term temperature +80 °C)	
		Fire resistance:	Non declared performance	
		Assumed working life:	50 years	
4.	Manufacturer	Index Fixing Systems. Técnicas Expansivas S.L. Segador, 13 26006 Logroño, La Rioja, ESPAÑA		
5.	Authorized representative	Not applicable		
6.	System of assessment of performance:	1		
7.	Harmonized standard:	Not applicable		
8.	European technical assessment:	Technical assessment body:	TZUS: Technikỳ a Zkušební Ústav Stavební Praha s.p. Notified body 1020.	
		Issued:	Concrete	ETA 14/0138
			Masonry	ETA 16/0841
			Post-installed rebar connections	ETA 13/0780
		On the basis of:	Concrete	EAD 330499-00-0601
			Masonry	EAD 330076-00-0604
			Post-installed rebar connections	EAD 330087-00-0601
		Performed:	Determination of product type, initial inspection of the manufacturing plant and continuous surveillance of FPC	
		Under system:	1	
		Issued:	Concrete	Certificate CE 1020-CPR-090-032411
			Masonry	Certificate CE 1020-CPR-090-036865
			Post-installed rebar connections	Certificate CE 1020-CPR-090-043513

9. Declared performances: Use for structural applications in cracked and non-cracked concrete.

Installation parameters intended use 1: Threaded rods fixings in concrete:			**Performances**							
			M8	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
d_0	Nominal drill bit diameter:	[mm]	10	12	14	18	22	26	30	35
T_{inst}	Installation Torque:	[Nm]	10	20	40	80	150	200	240	275
$h_{ef,min}$										
$h_0 = h_{ef}$	Drill hole depth:	[mm]	64	80	96	128	160	192	216	240
s_{min}	Minimum spacing	[mm]	35	40	50	65	80	96	110	120
c_{min}	Minimum edge distance	[mm]	35	40	50	65	80	96	110	120
h_{min}	Minimum concrete thickness	[mm]	h_{ef} + 30 mm ≥ 100					h_{ef} + $2d_0$		
$h_{ef,max}$										
$h_0 = h_{ef}$	Drill hole depth:	[mm]	160	200	240	320	400	480	540	600
s_{min}	Minimum spacing	[mm]	35	40	50	65	80	96	110	120
c_{min}	Minimum edge distance	[mm]	35	40	50	65	80	96	110	120
h_{min}	Minimum concrete thickness	[mm]	h_{ef} + 30 mm ≥ 100					h_{ef} + $2d_0$		
Tension characteristic resistances for calculation method A:			**Performances**							
			M8	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
STEEL FAILURE										
$N_{Rk,s}$	Characteristic resistance steel grade 4.6:	[kN]	15	23	34	63	98	141	184	224
γ_{Ms}	Partial safety factor 4.6:	[-]	2,00							
$N_{Rk,s}$	Characteristic resistance steel grade 5.8:	[kN]	18	29	42	79	123	177	230	281
γ_{Ms}	Partial safety factor5.8:	[-]	1,50							
$N_{Rk,s}$	Characteristic resistance steel grade 8.8:	[kN]	29	46	67	126	196	282	367	449
γ_{Ms}	Partial safety factor8.8:	[-]	1,50							
$N_{Rk,s}$	Characteristic resistance steel grade 10.9:	[kN]	37	58	84	157	245	353	459	561
γ_{Ms}	Partial safety factor 10.9:	[-]	1,33							
$N_{Rk,s}$	Characteristic resistance stainless steel grade A2-70, A4-70:	[kN]	26	41	59	110	172	247	321	393
γ_{Ms}	Partial safety factor A2-70, A4-70:	[-]	1,87							
$N_{Rk,s}$	Characteristic resistance stainless steel grade A4-80:	[kN]	29	46	67	126	196	282	367	449
γ_{Ms}	Partial safety factor A4-80:	[-]	1,60							
$N_{Rk,s}$	Characteristic resistance stainless steel grade 1.4529:	[kN]	26	41	59	110	172	247	321	393
γ_{Ms}	Partial safety factor 1.4529:	[-]	1,50							
$N_{Rk,s}$	Characteristic resistance stainless steel grade 1.4565:	[kN]	26	41	59	110	172	247	321	393
γ_{Ms}	Partial safety factor 1.4565:	[-]	1,87							

Tension characteristic resistances for calculation method A:			Performances							
			M8	M10	M12	M16	M20	M24	M27	M30
COMBINED PULLOUT AND CONCRETE CONE FAILURE IN UNCRACKED CONCRETE C20/25										
$\tau_{Rk,ucr}$	Characteristic bond resistance for Dry/wet concrete	[N/mm^2]	10	9,5	9,5	9	8,5	8	6,5	5,5
$\gamma_2^{1)} = \gamma_{inst}^{2}$	Installation safety factor	[-]	1,2						1,4	
$\tau_{Rk,ucr}$	Characteristic bond resistance for flooded holes	[N/mm^2]	8,5	7,5	7	7	6,5	5,5	--	
$\gamma_2^{1)} = \gamma_{inst}^{2}$	Installation safety factor	[-]	1,4							
Ψ_c	Factor for concrete C50/60	[-]	1							

Tension characteristic resistances for calculation method A:			Performances				
			M10	M12	M16	M20	M24
COMBINED PULLOUT AND CONCRETE CONE FAILURE IN CRACKED CONCRETE C20/25							
$\tau_{Rk,cr}$	Characteristic bond resistance for Dry/wet concrete	[N/mm^2]	4,5	4,5	4,5	4	4
$\gamma_2^{1)} = \gamma_{inst}^{2)}$	Installation safety factor	[-]	1,2				
$\tau_{Rk,cr}$	Characteristic bond resistance for flooded holes	[N/mm^2]	4,5	4,5	4,5	4	4
$\gamma_2^{1)} = \gamma_{inst}^{2)}$	Installation safety factor	[-]	1,4				
Ψ_c	C30/37	[-]	1,12				
Ψ_c	C35/45	[-]	1,19				
Ψ_c	C50/60	[-]	1,30				
CONRETE CONE FAILURE							
k_1	Factor for concrete cone failure for uncracked concrete	[-]	10,1				
$k_{ucr,N}$	Factor for concrete cone failure for uncracked concrete	[-]	11				
k_1	Factor for concrete cone failure for cracked concrete	[-]	7,2				
$k_{cr,N}$	Factor for concrete cone failure for cracked concrete	[-]	7,7				
$C_{cr,N}$	Distancia crítica al borde del hormigón	[mm]	1,5 h_{ef}				
$\gamma_2^{1)} = \gamma_{inst}^{2)}$	Installation safety factor	[-]	See combined pullout and concrete cone failure				
SPLITTING FAILURE							
Sizes			M8	M10	M12	M16	M20	M24	M27	M30
$C_{cr,sp}$	Edge distance	[mm]	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}
$S_{cr,sp}$	Spacing	[mm]	3,0 h_{ef}	3,0 h_{ef}	3,0 h_{ef}	3,0 h_{ef}	3,0 h_{ef}	3,0 h_{ef}	3,0 h_{ef}	3,0 h_{ef}
$\gamma_2^{1)} = \gamma_{inst}^{2)}$	Installation safety factor	[-]	See combined pullout and concrete cone failure							

[1)] Design according EOTA Technical Report TR 055.
[2)] Design according EN 1992-4:2016

Tension characteristic resistances for calculation method A:			Performances							
			M8	M10	M12	M16	M20	M24	M27	M30
DISPLACEMENTS UNDER TENSION LOADS										
NON-CRACKED CONCRETE										
N	Service load under tension	[kN]	6,3	7,9	11,9	15,9	23,8	29,8	37,7	45,6
δ_{N0}	Displacements	[mm]	0,3	0,3	0,3	0,3	0,4	0,5	0,5	0,5
$\delta_{N\infty}$	Displacements	[mm]	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
CRACKED CONCRETE										
N	Service load under tension	[kN]	--	5,1	7,4	13,1	20,5	24,6	--	--
δ_{N0}	Displacements	[mm]	--	0,4	0,7	0,7	0,7	0,6	--	--

Tension characteristic resistances for calculation method A:			Performances							
			M8	M10	M12	M16	M20	M24	M27	M30
STEEL FAILURE WITHOUT LEVER ARM										
$V_{Rk,s}$	Characteristic resistance steel grade 4.6:	[kN]	7	12	17	31	49	71	92	112
γ_{Ms}	Partial safety factor 4.6:	[-]	1,67							
$V_{Rk,s}$	Characteristic resistance steel grade 5.8:	[kN]	9	15	21	39	61	88	115	140
γ_{Ms}	Partial safety factor5.8:	[-]	1,25							
$V_{Rk,s}$	Characteristic resistance steel grade 8.8:	[kN]	15	23	34	63	98	141	184	224
γ_{Ms}	Partial safety factor8.8:	[-]	1,25							
$V_{Rk,s}$	Characteristic resistance steel grade 10.9:	[kN]	18	29	42	79	123	177	230	281
γ_{Ms}	Partial safety factor 10.9:	[-]	1,5							
$V_{Rk,s}$	Characteristic resistance stainless steel grade A2-70, A4-70:	[kN]	13	20	30	55	86	124	161	196
γ_{Ms}	Partial safety factor A2-70, A4-70:	[-]	1,56							
$V_{Rk,s}$	Characteristic resistance stainless steel grade A4-80:	[kN]	15	23	34	63	98	141	184	224
γ_{Ms}	Partial safety factor A4-80:	[-]	1,33							
$V_{Rk,s}$	Characteristic resistance stainless steel grade 1.4529:	[kN]	13	20	30	55	86	124	161	196
γ_{Ms}	Partial safety factor 1.4529:	[-]	1,25							
$V_{Rk,s}$	Characteristic resistance stainless steel grade 1.4565:	[kN]	13	20	30	55	86	124	161	196
γ_{Ms}	Partial safety factor 1.4565:	[-]	1,56							
CHARACTERISTIC RESISTANCE OF GROUP OF FASTENERS										
Ductility factor k_7 = 1,0 for Steel with rupture elongation A_5 > 8%										

Shear characteristic resistances for calculation method A:			Performances							
			M8	M10	M12	M16	M20	M24	M27	M30
STEEL FAILURE WITH LEVER ARM										
$M^0_{Rk,s}$	Characteristic resistance steel grade 4.6:	[N.m]	15	30	52	133	260	449	666	900
γ_{Ms}	Partial safety factor 4.6:	[-]	1,67							
$M^0_{Rk,s}$	Characteristic resistance steel grade 5.8:	[N.m]	19	37	66	166	325	561	832	1125
γ_{Ms}	Partial safety factor5.8:	[-]	1,25							
$M^0_{Rk,s}$	Characteristic resistance steel grade 8.8:	[N.m]	30	60	105	266	519	898	1332	1799
γ_{Ms}	Partial safety factor8.8:	[-]	1,25							
$M^0_{Rk,s}$	Characteristic resistance steel grade 10.9:	[N.m]	37	75	131	333	649	1123	1664	2249
γ_{Ms}	Partial safety factor 10.9:	[-]	1,5							
$M^0_{Rk,s}$	Characteristic resistance stainless steel grade A2-70, A4-70:	[N.m]	26	52	92	233	454	786	1165	1574
γ_{Ms}	Partial safety factor A2-70, A4-70:	[-]	1,56							
$M^0_{Rk,s}$	Characteristic resistance stainless steel grade A4-80:	[N.m]	30	60	105	266	519	898	1332	1799
γ_{Ms}	Partial safety factor A4-80:	[-]	1,33							
$M^0_{Rk,s}$	Characteristic resistance stainless steel grade 1.4529:	[N.m]	26	52	92	233	454	786	1165	1574
γ_{Ms}	Partial safety factor 1.4529:	[-]	1,25							
$M^0_{Rk,s}$	Characteristic resistance stainless steel grade 1.4565:	[N.m]	26	52	92	233	454	786	1165	1574
γ_{Ms}	Partial safety factor 1.4565:	[-]	1,56							
Shear characteristic resistances for calculation method A:			**Performances**							
			M8	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
CONCRETE PRYOUT FAILURE										
K_8	Factor K	[-]	2							
γ_2 [1] = γ_{inst} [2]	Installation safety factor	[-]	1,0							
CONCRETE EDGE FAILURE										
d_{nom}	Outside diameter of fastener	[mm]	8	10	12	16	20	24	27	30
l_f	Effective length of fastener	[mm]	min (h_{ef}, 8 d_{nom})							
γ_2 [1] = γ_{inst} [2]	Installation safety factor	[-]	1,0							
DISPLACEMENTS UNDER SHEAR LOAD										
N	Service load under tension	[kN]	3,1	5,0	7,2	13,5	21,0	30,3	39,4	48,0
δ_{V0}	Displacements	[mm]	1,5	1,5	1,5	1,5	2,0	2,5	2,5	2,5
$\delta_{V\infty}$	Displacements	[mm]	2,3	2,3	2,3	2,3	3,0	3,8	3,8	3,8

[1] Design according EOTA Technical Report TR 055.
[2] Design according EN 1992-4:2016.

Installation parameters intended use 1:			**Performances**						
Rebar fixings in concrete:			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
d_0	Nominal drill bit diameter:	[mm]	12	14	16	20	25	32	40
$h_{ef,min}$									
$h_0 = h_{ef}$	Drill hole depth:	[mm]	64	80	96	128	160	200	256
s_{min}	Minimum spacing	[mm]	35	40	50	65	80	100	130
c_{min}	Minimum edge distance	[mm]	35	40	50	65	80	100	130
h_{min}	Minimum concrete thickness	[mm]	h_{ef} + 30 mm ≥ 100					h_{ef} + $2d_0$	
$h_{ef,max}$									
$h_0 = h_{ef}$	Drill hole depth:	[mm]	160	200	240	320	400	500	640
s_{min}	Minimum spacing	[mm]	35	40	50	65	80	100	130
c_{min}	Minimum edge distance	[mm]	35	40	50	65	80	100	130
h_{min}	Minimum concrete thickness	[mm]	h_{ef} + 30 mm ≥ 100					h_{ef} + $2d_0$	
TENSION LOAD: STEEL FAILURE									
SIZES			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
$N_{Rk,s}$	Characteristic resistance rebar BSt 500 S:	[kN]	28	43	62	111	173	270	442
γ_{Ms}	Partial safety factor	[-]	1,4	1,4	1,4	1,4	1,4	1,4	1,4
TENSION LOAD: COMBINED PULLOUT AND CONCRETE CONE FAILURE IN UNCRACKED CONCRETE C20/25									
$\tau_{Rk,ucr}$	Characteristic bond resistance for Dry/wet concrete	[N/mm^2]	11	9,5	9,5	9	8,5	8,5	5,5
γ_2 [1] = γ_{inst} [2]	Installation safety factor	[-]	1,2						
$\tau_{Rk,ucr}$	Characteristic bond resistance for flooded hole	[N/mm^2]	11	9,5	9,5	9	8,5	8,5	5,5
γ_2 [1] = γ_{inst} [2]	Installation safety factor	[-]	1,4						
Ψ_c	Factor for concrete C50/60	[-]	1						
TENSION LOAD: CONRETE CONE FAILURE									
k_1	Factor for concrete cone failure	[-]	10,1						
$k_{ucr,N}$	Factor for concrete cone failure	[-]	11						
$C_{cr,N}$	Edge distance	[mm]	1,5 h_{ef}						
γ_2 [1] = γ_{inst} [2]	Installation safety factor	[-]	see Combined pullout and concrete cone failure						
TENSION LOAD: SPLITTING FAILURE									
$c_{cr,sp}$	Edge distance (splitting):	[mm]	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}
$s_{cr,sp}$	Spacing (splitting):	[mm]	3 h_{ef}	3 h_{ef}	3 h_{ef}	3 h_{ef}	3 h_{ef}	3 h_{ef}	3 h_{ef}
γ_2 [1] = γ_{inst} [2]	Installation safety factor	[-]	see Combined pullout and concrete cone failure						

Installation parameters intended use 1: Rebar fixings in concrete:			Performances						
			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
DISPLACEMENTS UNDER TENSION LOADS									
N	Service loads under tension	[kN]	7,9	9,9	13,9	23,8	29,8	55,6	55,6
δ_{N0}	Displacements	[mm]	0,3	0,3	0,3	0,4	0,4	0,5	0,5
$\delta_{N\infty}$	Displacements	[mm]	0,5	0,5	0,5	0,5	0,5	0,5	0,5
SHEAR LOADS: STEEL FAILURE WITHOUT LEVER ARM									
$V_{Rk,s}$	Characteristic resistance rebar BSt 500 S:	[kN]	14	22	31	55	86	135	221
γ_{Ms}	Partial safety factor	[-]	1,5						
CHARACTERISTIC RESISTANCE OF GROUP OF FASTENERS									
Ductility factor k_7 = 1,0 for Steel with rupture elongation A_5 > 8%									
SHEAR LOADS: STEEL FAILURE WITHOUT LEVER ARM									
$V_{Rk,s}$	Characteristic resistance rebar BSt 500 S:	[kN]	33	65	112	265	518	1013	2122
γ_{Ms}	Partial safety factor	[-]	1,5						
PRYOUT FAILURE									
K_8	Factor K	[-]	2						
γ_2 [1)] = γ_{inst} [2)]	Installation safety factor	[-]	1,0						
CONCRETE EDGE FAILURE									
d_{nom}	Outside diameter of rebar	[mm]	8	10	12	16	20	25	32
ℓ_f	Effective length of rebar	[mm]	min (h_{ef}, 8 d_{nom})						
γ_2 [1)] = γ_{inst} [2)]	Installation safety factor	[-]	1,5						
DISPLACEMENTS UNDER SHEAR LOADS									
N	Service loads under shear	[kN]	5,9	9,3	13,3	23,7	37,0	57,9	94,8
δ_{V0}	Displacements	[mm]	0,3	0,4	0,4	0,4	0,4	0,5	0,9
$\delta_{V\infty}$	Displacements	[mm]	0,5	0,6	0,6	0,6	0,6	0,8	1,4

Basic requirements on works. Intended use 1: Characteristic values of resistance under seismic action category C1			Performances				
			M10	M12	M16	M20	M24
TENSION LOADS: STEEL FAILURE							
$N_{Rk,s,eq}$	Characteristic resistance steel grade 4.6:	[kN]	23	34	63	98	141
γ_{Ms}	Partial safety factor 4.6:	[-]	2,00				
$N_{Rk,s,eq}$	Characteristic resistance steel grade 5.8:	[kN]	29	42	79	123	177
γ_{Ms}	Partial safety factor5.8:	[-]	1,50				
$N_{Rk,s,eq}$	Characteristic resistance steel grade 8.8:	[kN]	46	67	126	196	282
γ_{Ms}	Partial safety factor8.8:	[-]	1,50				
$N_{Rk,s,eq}$	Characteristic resistance steel grade 10.9:	[kN]	58	84	157	245	353
γ_{Ms}	Partial safety factor 10.9:	[-]	1,33				

Basic requirements on works. Intended use 1: Characteristic values of resistance under seismic action category C1	Performances				
	M10	M12	M16	M20	M24
TENSION LOADS: STEEL FAILURE					

$N_{Rk,s,eq}$	Characteristic resistance stainless steel grade A2-70, A4-70:	[kN]	41	59	110	172	247
γ_{Ms}	Partial safety factor A2-70, A4-70:	[-]	1,87				
$N_{Rk,s,eq}$	Characteristic resistance stainless steel grade A4-80:	[kN]	46	67	126	196	282
γ_{Ms}	Partial safety factor A4-80:	[-]	1,60				
$N_{Rk,s,eq}$	Characteristic resistance stainless steel grade 1.4529:	[kN]	41	59	110	172	247
γ_{Ms}	Partial safety factor 1.4529:	[-]	1,50				
$N_{Rk,s,eq}$	Characteristic resistance stainless steel grade 1.4565:	[kN]	41	59	110	172	247
γ_{Ms}	Partial safety factor 1.4565:	[-]	1,87				
COMBINED PULLOUT AND CONCRETE CONE FAILURE							
$\tau_{Rk,p,eq,C1}$	Characteristic bond resistance for Dry/wet concrete	[N/mm^2]	3,5	3,5	3,5	3,5	3,5
$\gamma_2^{1)} = \gamma_{inst}^{2)}$	Installation safety factor	[-]	1,2				
$\tau_{Rk,p,eq,C1}$	Characteristic bond resistance for flooded hole	[N/mm^2]	3,5	3,5	3,5	3,5	3,5
$\gamma_2^{1)} = \gamma_{inst}^{2)}$	Installation safety factor	[-]	1,4				
SHEAR LOADS: STEEL FAILURE WITHOUT LEVER ARM							
$V_{Rk,s,eq}$	Characteristic resistance steel grade 4.6:	[kN]	7	10	23	30	40
γ_{Ms}	Partial safety factor 4.6:	[-]	1,67				
$V_{Rk,s,eq}$	Characteristic resistance steel grade 5.8:	[kN]	9	13	28	38	51
γ_{Ms}	Partial safety factor5.8:	[-]	1,25				
$V_{Rk,s,eq}$	Characteristic resistance steel grade 8.8:	[kN]	14	21	45	61	81
γ_{Ms}	Partial safety factor8.8:	[-]	1,25				
$V_{Rk,s,eq}$	Characteristic resistance steel grade 10.9:	[kN]	18	26	56	76	101
γ_{Ms}	Partial safety factor 10.9:	[-]	1,50				
$V_{Rk,s,eq}$	Characteristic resistance stainless steel grade A2-70, A4-70:	[kN]	12	18	39	53	71
γ_{Ms}	Partial safety factor A2-70, A4-70:	[-]	1,56				
$V_{Rk,s,eq}$	Characteristic resistance stainless steel grade A4-80:	[kN]	14	21	45	61	81
γ_{Ms}	Partial safety factor A4-80:	[-]	1,33				
$V_{Rk,s,eq}$	Characteristic resistance stainless steel grade 1.4529:	[kN]	12	18	39	53	71
γ_{Ms}	Partial safety factor 1.4529:	[-]	1,25				
$V_{Rk,s,eq}$	Characteristic resistance stainless steel grade 1.4565:	[kN]	12	18	39	53	71
γ_{Ms}	Partial safety factor 1.4565:	[-]	1,56				
α_{gap}	Factor for annular gap	[-]	0,5				

Installation parameters intended use 2. Threaded rods fixings in masonry:	**Performances**		
	M8	**M10**	**M12**
THREADED ROD WITH NYLON SLEEVE			

d_s	Nylon sleeve, Diameter	[mm]	16	16	20
l_s	Nylon sleeve, Length	[mm]	85	85	85
h_0	Drill hole depth	[mm]	90	90	90
h_{ef}	Effective depth	[mm]	85	85	85
$d_f \leq$	Diameter of clearance hole in the fixture:	[mm]	9	12	14
T_{inst}	Nominal installation torque	[mm]	2	2	2

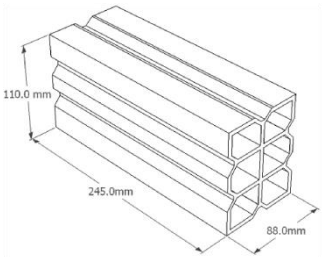
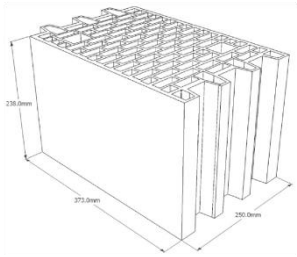
SPACING AND EDGE DISTANCES									
Base Material	**M8**			**M10**			**M12**		
	$C_{cr}=C_{min}$	$S_{cr\,II} = S_{min\,II}$	$S_{cr\perp} = S_{min\perp}$	$C_{cr}=C_{min}$	$S_{cr\,II} = S_{min\,II}$	$S_{cr\perp} = S_{min\perp}$	$C_{cr}=C_{min}$	$S_{cr\,II} = S_{min\,II}$	$S_{cr\perp} = S_{min\perp}$
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Brick number 1	100	245	110	100	245	110	120	245	110
Brick number 1	100	373	238	100	373	238	120	373	238

CHARACTERISTIC RESISTANCES UNDER TENSION AND SHEAR LOADS						
Base Material	Threaded Rods $N_{Rk} = V_{Rk}$ [kN]			Partial safety factor γ_{Mm}		
	M8	**M10**	**M12**	**M8**	**M10**	**M12**
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Brick number 1	0,9	1,5	1,5	2,5		
Brick number 1	2,0	2,0	2,5	2,5		

CHARACTERISTIC BENDING MOMENT					
SIZES			**M8**	**M10**	**M12**
$M^0_{Rk,s}$	Characteristic resistance steel grade 5.8:	[N.m]	19	37	66
γ_{Ms}	Partial safety factor5.8:	[-]	1,25		
$M^0_{Rk,s}$	Characteristic resistance steel grade 8.8:	[N.m]	30	60	105
γ_{Ms}	Partial safety factor8.8:	[-]	1,25		
$M^0_{Rk,s}$	Characteristic resistance steel grade 10.9:	[N.m]	37	75	131
γ_{Ms}	Partial safety factor 10.9:	[-]	1,5		
$M^0_{Rk,s}$	Characteristic resistance stainless steel grade A2-70, A4-70:	[N.m]	26	52	92
γ_{Ms}	Partial safety factor A2-70, A4-70:	[-]	1,56		
$M^0_{Rk,s}$	Characteristic resistance stainless steel grade A4-80:	[N.m]	30	60	105
γ_{Ms}	Partial safety factor A4-80:	[-]	1,33		
$M^0_{Rk,s}$	Characteristic resistance stainless steel grade 1.4529:	[N.m]	26	52	92
γ_{Ms}	Partial safety factor 1.4529:	[-]	1,25		
$M^0_{Rk,s}$	Characteristic resistance stainless steel grade 1.4565:	[N.m]	26	52	92
γ_{Ms}	Partial safety factor 1.4565:	[-]	1,56		

DISPLACEMENTS UNDER TENSION AND SHEAR LOAD					
Base Material	F[kN]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]
Hollow clay brick	$N_{Rk} / (1,4 \cdot \gamma_M)$	0,5	1,0	1,0	1,5

Brick Nº	**Nº 1**	**Nº 2**
Factor β	0,78	0,83

BRICK TYPE			
Brick nº 1 Hollow clay brick Hueco Doble according to EN 771-1 length/width/height = 245 mm/110 mm/88 mm fb ≥ 2,5 N/mm2 / □ ≥ 0,74 kg/dm3		**Brick nº 2** Hollow clay brick Porotherm P+W according to EN 771-1 length/width/height = 373 mm/250 mm/238 mm fb ≥ 12 N/mm2 / □ ≥ 0,9 kg/dm3	

Installation parameters intended use 3. Post-installed rebar connections:			Performances						
			Φ8	Φ10	Φ12	Φ14	Φ16	Φ20	Φ25
d_0	Nominal drill bit diameter:	[mm]	12 (10)	14 (12)	16	20	25	32	40
l_v	Maximum dril hole depth	[mm]	400	500	600	700	800	1000	1000
COEFICIENTES DE ADHERENCIA PARA TODOS MÉTODOS TALADRADO PARA BUENAS CONDICIONES DE ADHERENCIA									
Rebar from Ø 8 to Ø 16									
Concrete class		C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
K_b	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
$f_{bd,PIR}$	[N/mm^2]	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
Rebar of Ø 20										
Concrete class		C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
K_b	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	0,92	0,86
$f_{bd,PIR}$	[N/mm^2]	1,6	2,0	2,3	2,7	3,0	3,4	3,7	3,7	3,7
Rebar of Ø 25										
Concrete class		C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
K_b	[-]	1,0	1,0	1,0	1,0	1,0	0,90	0,82	0,76	0,71
$f_{bd,PIR}$	[N/mm^2]	1,6	2,0	2,3	2,7	3,0	3,0	3,0	3,0	3,0
AMPLIFICATION FACTOR FOR MINIMUM ANCHORAGE LENGTH										
Rebar from Ø8 to Ø 25										
Concrete class		C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Amplification factor	α_{lb}	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0

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, 01.04.2019