Declaration of Performance
DoP MO-PS-en

1. Product type — Styrene free polyester bonded anchor MO-PS, MO-PSS, MO-PSP, MO-PSW.

2. Identification

Code	Description
MOPS300	Styrene free polyester bonded anchor 300 ml
MOPS410	Styrene free polyester bonded anchor 410 ml
MOPSP300	Styrene free polyester bonded anchor 300 ml stone colored
MOPSP410	Styrene free polyester bonded anchor 410 ml stone colored
MOPSW300	Styrene free polyester bonded anchor 300 ml fast curing
MOPSW410	Styrene free polyester bonded anchor 410 ml fast curing
MOPSS300	Styrene free polyester bonded anchor 300 ml slow curing
MOPSS410	Styrene free polyester bonded anchor 410 ml slow curing

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.
Material / durability:	a) Carbon galvanized steel class 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.
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

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 13/0751
			Masonry	ETA 17/0096
		On the basis of:	Concrete	EAD 330499-00-0601
			Masonry	EAD 330076-00-0604
		Performed:	Determination of product type, initial inspection of the manufacturing plant and continuous surveillance of FPC	
		Under system:	1	
		Technical assessment body:	Concrete	Certificate CE 1020-CPR-090-041428
			Masonry	Certificate CE 1020-CPR-090-037484
9.	Declared performances:	Use for structural applications in non-cracked concrete.		

Parámetros de instalación uso previsto 1. Threaded rods fixings in concrete:			Performances					
			M8	M10	M12	M16	M20	M24
d_0	Nominal drill bit diameter:	[mm]	10	12	14	18	22	26
T_{inst}	Installation Torque:	[Nm]	10	20	40	80	150	200
$h_{ef,min}$								
$h_0 = h_{ef}$	Drill hole depth:	[mm]	64	80	96	128	160	192
s_{min}	Minimum spacing	[mm]	35	40	50	65	80	96
c_{min}	Minimum edge distance	[mm]	35	40	50	65	80	96
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]	96	120	144	192	240	288
s_{min}	Minimum spacing	[mm]	35	40	50	65	80	96
c_{min}	Minimum edge distance	[mm]	35	40	50	65	80	96
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**
STEEL FAILURE								
$N_{Rk,s}$	Characteristic resistance steel grade 5.8:	[kN]	18	29	42	79	123	177
γ_{Ms}	Partial safety factor5.8:	[-]	1.5					
$N_{Rk,s}$	Characteristic resistance steel grade 8.8:	[kN]	29	46	67	126	196	282
γ_{Ms}	Partial safety factor8.8:	[-]	1.5					
$N_{Rk,s}$	Characteristic resistance steel grade 10.9:	[kN]	37	58	84	157	245	353
γ_{Ms}	Partial safety factor 10.9:	[-]	1.4					
$N_{Rk,s}$	Characteristic resistance stainless steel grade A2-70, A4-70:	[kN]	26	41	59	110	172	247
γ_{Ms}	Partial safety factor A2-70, A4-70:	[-]	1.9					
$N_{Rk,s}$	Characteristic resistance stainless steel grade A4-80:	[kN]	29	46	67	126	196	282
γ_{Ms}	Partial safety factor A4-80:	[-]	1.6					
$N_{Rk,s}$	Characteristic resistance stainless steel grade 1.4529:	[kN]	26	41	59	110	172	247
γ_{Ms}	Partial safety factor 1.4529:	[-]	1.5					
$N_{Rk,s}$	Characteristic resistance stainless steel grade 1.4565:	[kN]	26	41	59	110	172	247
γ_{Ms}	Partial safety factor 1.4565:	[-]	1.9					

Tension characteristic resistances for calculation method A:			**Performances**					
			M8	**M10**	**M12**	**M16**	**M20**	**M24**
COMBINED PULLOUT AND CONCRETE CONE FAILURE IN UNCRACKED CONCRETE C20/25								
$\tau_{Rk,ucr}$	Characteristic bond resistance for Dry/wet concrete and flooded hole	[N/mm^2]	8,5	8	9	9	8	7,5
γ_2 [1] = γ_{inst} [2]	Installation safety factor	[-]	1,2					
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	[-]	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	[-]	1,2					
SPLITTING FAILURE								
$C_{cr,sp}$	Edge distance	[mm]	2,0 h_{ef}	2,0 h_{ef}	2,0 h_{ef}	1,5 h_{ef}	1,5 h_{ef}	1,5 h_{ef}
$S_{cr,sp}$	Spacing	[mm]	4,0 h_{ef}	4,0 h_{ef}	4,0 h_{ef}	3,0 h_{ef}	3,0 h_{ef}	3,0 h_{ef}
γ_2 [1] = γ_{inst} [2]	Installation safety factor	[-]	1,2					
[1] Design according EOTA Technical Report TR 055. [2] Design according EN 1992-4:2016								
DISPLACEMENTS UNDER TENSION LOADS								
N	Service load under tension	[kN]	6,3	7,9	11,9	23,8	29,8	45,6
δ_{N0}	Displacements	[mm]	0,2	0,2	0,3	0,5	0,7	0,9
$\delta_{N\infty}$	Displacements	[mm]	0,4	0,4	0,4	0,4	0,4	0,4

Shear characteristic resistances for calculation method A:			Performances					
			M8	M10	M12	M16	M20	M24
STEEL FAILURE WITHOUT LEVER ARM								
$V_{Rk,s}$	Characteristic resistance steel grade 5.8:	[kN]	9	15	21	39	61	88
γ_{Ms}	Partial safety factor 5.8:	[-]	1,25					
$V_{Rk,s}$	Characteristic resistance steel grade 8.8:	[kN]	15	23	34	63	98	141
γ_{Ms}	Partial safety factor 8.8:	[-]	1,25					
$V_{Rk,s}$	Characteristic resistance steel grade 10.9:	[kN]	18	29	42	79	123	177
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
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
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
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
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%								
STEEL FAILURE WITH LEVER ARM								
$M^0_{Rk,s}$	Characteristic resistance steel grade 5.8:	[N.m]	19	37	66	166	325	561
γ_{Ms}	Partial safety factor 5.8:	[-]	1,25					
$M^0_{Rk,s}$	Characteristic resistance steel grade 8.8:	[N.m]	30	60	105	266	519	898
γ_{Ms}	Partial safety factor 8.8:	[-]	1,25					
$M^0_{Rk,s}$	Characteristic resistance steel grade 10.9:	[N.m]	37	75	131	333	649	1123
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
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
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
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
γ_{Ms}	Partial safety factor 1.4565:	[-]	1,56					

Shear characteristic resistances for calculation method A:			Performances					
			M8	M10	M12	M16	M20	M24
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
l_f	Effective length of fastener	[mm]	min (h_{ef}, 8 d_{nom})					
γ_2 [1] = γ_{inst} [2]	Installation safety factor	[-]	1,0					
[1] Design according EOTA Technical Report TR 055. [2] Design according EN 1992-4:2016.								
DISPLACEMENTS UNDER SHEAR LOAD								
N	Service load under tension	[kN]	5,2	8,3	12,0	22,4	35,0	50,4
δ_{N0}	Displacements	[mm]	0,1	0,1	0,2	0,4	0,8	1,5
$\delta_{N\infty}$	Displacements	[mm]	0,2	0,2	0,3	0,6	1,2	2,3

Installation parameters intended use 2. Threaded rods fixings in masonry:			Performances					
			M8		M10		M12	
NYLON SLEEVE								
d_s	Nylon sleeve, Diameter	[mm]	15	16	15	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	
METALLIC THREADED SLEEVE								
d_s	Nylon sleeve, Diameter	[mm]	15	16	20		20	
l_s	Nylon sleeve, Length	[mm]	85		85		85	
d_{to}	Threaded sleeve, Diameter	[mm]	12		14		16	
l_t	Threaded sleeve, Length	[mm]	80		80		80	
h_0	Drill hole depth	[mm]	90		90		90	
h_{ef}	Effective depth	[mm]	80		80		80	
$d_f \leq$	Diameter of clearance hole in the fixture:	[mm]	9		12		14	
T_{inst}	Nominal installation torque	[mm]	2		2		2	

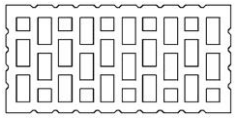
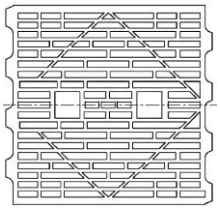
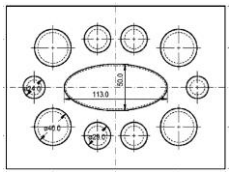
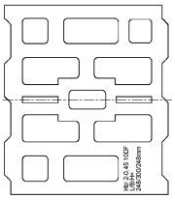
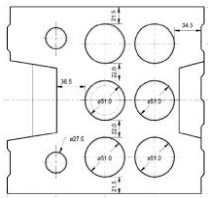
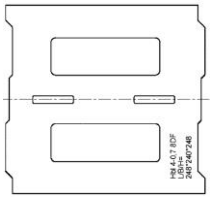
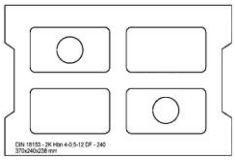
SPACING AND EDGE DISTANCES									
NYLON SLEEVE									
Base Material	**M8**			**M10**			**M12**		
	$C_{cr}=C_{min}$	$S_{cr\,II}=S_{min\,II}$	$S_{cr\perp}=S_{min\perp}$	$C_{cr}=C_{min}$	$S_{cr\,II}=S_{min\,II}$	$S_{cr\perp}=S_{min\perp}$	$C_{cr}=C_{min}$	$S_{cr\,II}=S_{min\,II}$	$S_{cr\perp}=S_{min\perp}$
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Brick number 1	100	235	115	100	235	115	120	235	115
Brick number 2	100	240	113	100	240	113	120	240	113
Brick number 3	100	250	237	100	250	237	120	250	237
Brick number 4	128	255	255	128	255	255	128	255	255
Brick number 5	128	255	255	128	255	255	128	255	255
Brick number 6	100	250	240	100	250	240	120	250	240
Brick number 7	100	250	248	100	250	248	-	-	-
Brick number 8	100	250	248	100	250	248	120	250	248
Brick number 9	100	370	238	100	370	238	120	370	238
METALLIC THREADED SLEEVE									
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	235	115	100	235	115	120	235	115
Brick number 2	100	240	113	100	240	113	120	240	113
Brick number 3	-	-	-	100	250	237	120	250	237
Brick number 4	128	255	255	128	255	255	128	255	255
Brick number 5	128	255	255	128	255	255	128	255	255
Brick number 6	100	250	240	100	250	240	120	250	240
Brick number 7	100	250	248	100	250	248	-	-	-
Brick number 8	-	-	-	100	250	248	120	250	248
Brick number 9	100	370	238	100	370	238	120	370	238

CHARACTERISTIC RESISTANCES UNDER TENSION AND SHEAR LOADS									
Base Material	Nylon sleeve $N_{Rk} = V_{Rk}$ [kN]			Metallic threaded sleeve $N_{Rk} = V_{Rk}$ [kN]			Partial safety factor γ_{Mm}		
	M8	**M10**	**M12**	**M8**	**M10**	**M12**	**M8**	**M10**	**M12**
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Brick number 1	2,5	2,0	2,0	1,5	2,5	2,5	2,5		
Brick number 2	0,75	1,2	0,5	0,6	0,75	0,9	2,5		
Brick number 3	0,75	1,2	0,5	-	0,75	0,4	2,5		
Brick number 4	1,5	1,5	3,0	2,0	3,0	4,0	2,5		
Brick number 5	0,75	0,9	1,5	2,0	1,5	0,9	2,5		
Brick number 6	1,2	1,2	0,9	0,9	1,5	0,6	2,5		
Brick number 7	0,6	0,3	-	0,5	0,3	0,75	2,5		
Brick number 8	0,6	1,5	1,2	-	0,4	0,6	2,5		
Brick number 9	2,5	1,5	2,5	0,6	1,2	0,9	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 factor 5.8:	[-]	1,25		
$M^0_{Rk,s}$	Characteristic resistance steel grade 8.8:	[N.m]	30	60	105
γ_{Ms}	Partial safety factor 8.8:	[-]	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 T ENSION AND SHEAR LOADS IN MASONRY					
Base material	F[kN]	δ_{N0} [mm]	$\delta_{N\infty}$ [mm]	δ_{V0} [mm]	$\delta_{V\infty}$ [mm]
Solid Brick	$N_{Rk} / (1{,}4 \cdot \gamma_M)$	0,6	1,2	1,0	1,5
Solid and hollow brick		0,14	0,28	1,0	1,5

FACTORS FOR JOB SITE TESTS ACCORDING TO TR 053									
Brick Number	**Nº 1**	**Nº 2**	**Nº 3**	**Nº 4**	**Nº 5**	**Nº 6**	**Nº 7**	**Nº 8**	**Nº 9**
Factor β	0,62	0,28	0,22	0,48	0,26	0,43	0,42	0,36	0,60

Brick Types			
Brick nº 1 Hollow clay brick HLz 12-1,0-2DF according to EN 771-1 Length / width / height = 235 mm / 112 mm / 115 mm b ≥ 12 N/mm2 / ρ ≥ 1,0 kg/dm3		**Brick nº 6** Hollow clay brick HLzW 6-0,7-8DF according to EN 771-1 Length / width / height = 250 mm / 240 mm / 240 mm b ≥ 6 N/mm2 / ρ ≥ 0,8 kg/dm3	
Brick nº 2 Hollow sand lime brick KSL 12-1,4-3DF according to EN 771-2 Length / width / height = 240 mm / 175 mm / 113 mm b ≥ 12 N/mm2 / ρ ≥ 1,4 kg/dm3		**Brick nº 7** Lightweight concrete hollow block Hbl 2-0,45-10DF according to EN 771-3 Length / width / height = 250 mm / 300 mm / 248 mm b ≥ 2,0 N/mm2 / ρ ≥ 0,45 kg/dm3	
Brick nº 3 Hollow sand lime brick KSL 12-1,4-8DF according to EN 771-2 Length / width / height = 250 mm / 240 mm / 237 mm b ≥ 12 N/mm2 / ρ ≥ 1,4 kg/dm3		**Brick nº 8** Lightweight concrete hollow block Hbl 4-0,7-8DF according to EN 771-3 Length / width / height = 250 mm / 240 mm / 248 mm b ≥ 4,0 N/mm2 / ρ ≥ 0,7 kg/dm3	
Brick nº 4 Solid clay brick Mz 12-2,0-NF according to EN 771-1 Length / width / height = 240 mm / 116 mm / 71 mm b ≥ 12 N/mm2 / ρ ≥ 2,0 kg/dm3fb ≥ 12 N/mm2 / ρ ≥ 2,0 kg/dm		**Brick nº 9** Concrete masonry unit Hbn 4-12DF according to EN 771-3 Length / width / height = 370 mm / 240 mm / 238 mm b ≥ 4 N/mm2 / ρ ≥ 1,2 kg/dm3	
Brick nº 5 Solid sand lime brick KS 12-2,0-NF according to EN 771-2 Length / width / height = 240 mm / 115 mm / 70 mm b ≥ 12 N/mm2 / ρ ≥ 2,0 kg/dm3			

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