FRIULSIDER
YOUR FIXING FACTORY

Declaration of Performance

DoP nr. atsevo

Heavy duty safety bolt anchor made of galvanised steel

CE

1. Identification of the product: **ATS evo**

2. Identification code (art. 11.4), for the batch or serial number see packaging:

d [5]	L [6] [mm]	t_{fix} [7] [mm]	Marking	Cod. ATS evo-S (hexagonal head)	Cod. ATS evo-B (threaded bar)	d [5]	t_{fix} [7] [mm]	Marking	Cod. ATS evo-SK (countersunk head)
M6	70	10	FM-ATS Ø10/10	79302b10070	79402b10070	M6	15	FM-ATS Ø10/15 sk	79303b10070
	80	20	FM-ATS Ø10/20	79302b10080	79402b10080		25	FM-ATS Ø10/25 sk	79303b10080
	110	50	FM-ATS Ø10/50	79302b10110	79402b10110				
M8	80	10	FM-ATS Ø12/10	79302b12080	79402b12080	M8	16	FM-ATS Ø12/16 sk	79303b12080
	90	20	FM-ATS Ø12/20	79302b12090	79402b12090		26	FM-ATS Ø12/26 sk	79303b12090
	120	50	FM-ATS Ø12/50	79302b12120	79402b12120		56	FM-ATS Ø12/56 sk	79303b12120
M10	90	10	FM-ATS Ø15/10	79302b15090	79402b15090	M10	17	FM-ATS Ø15/17 sk	79303b15090
	100	20	FM-ATS Ø15/20	79302b15100	79402b15100		27	FM-ATS Ø15/27 sk	79303b15100
	130	50	FM-ATS Ø15/50	79302b15130	79402b15130				
	180	100	FM-ATS Ø15/100	79302b15180	79402b15180				
M12	110	10	FM-ATS Ø18/10	79302b18110	79402b18110	M12			
	125	25	FM-ATS Ø18/25	79302b18125	79402b18125		33	FM-ATS Ø18/33 sk	79303b18125
	150	50	FM-ATS Ø18/50	79302b18150	79402b18150				
	200	100	FM-ATS Ø18/100	79302b18200	79402b18200				
M16	125	10	FM-ATS Ø24/10	79302b24125	79402b24125	M16			
	140	25	FM-ATS Ø24/25	79302b24140	79402b24140				
	165	50	FM-ATS Ø24/50	79302b24165	79402b24165				
	215	100	FM-ATS Ø24/100	79302b24215	79402b24215				
M20	155	10	FM-ATS Ø28/10	79302b28160	79402b28160	M20			
	175	30	FM-ATS Ø28/30	79302b28180	79402b28180				
	205	60	FM-ATS Ø28/60	79302b28210	79402b28210				
	245	100	FM-ATS Ø28/100	79302b28250	79402b28250				
M24	175	10	FM-ATS Ø32/10	79302b32180	79402b32180	M24			
	195	30	FM-ATS Ø32/30	79302b32200	79402b32200				
	225	60	FM-ATS Ø32/60	79302b32230	79402b32230				

[5] Nominal diameter of thread; [6] Length of anchor; [7] Thickness fixture max.

3. Intended use:

Generic type	Torque controlled expansion anchor wedge type
Base material	Cracked and un-cracked concrete C20/25 to C50/60 acc. to EN 206-1
Material	Steel galvanised acc. to EN ISO 4042 (cl. 8.8 for bolt acc. to EN ISO 898-1)
Durability	Internal dry conditions
Loading	Static, quasi-static and Seismic
Fire Resistance	F120
Fire Reaction	A1 according to EN 13501-1

4. Manufacturer (art. 11.5): **Friulsider** SpA via trieste,1 - 33048 San Giovanni al Natisone (UD) - Italy

5. Authorised representative (art. 12.2): Not Relevant

6. System of Assessment AVCP (annex V): **System 1**

7/8. Harmonised Specification & Notified Body:

	Name of Body	System of Assessment	Reference	EAD / hEN Document
Technical Specification Document	ZAG [TAB]	1	**ETA-10/0423**	**ETAG001 p.1-2-Annex E**
Constancy of Performance & FPC	ZAG nr.1404 [NB]	1	1404-CPR-2553	ETAG001 p.1

9. Declared Performance: **See Annexes**

10. The performance of the product identified in points 1 and 2 is in conformity with declared performance in point 9. This declaration of performance is issued under the sole responsibility of Friulsider SpA.

Signed for and behalf of the manufacturer by:

Function	Name	Signature	Place and date of issue
Technical Manager	Raffaele Palmieri	Raffaele Palmieri	San Giovanni al Natisone, 09-11-2021

ANNEX I°

Declared Performances acc. to ETA-10/0423 - ETAG001 p.1 and 2
Design method ETAG001-Annex C or CEN/TS 1992-4

ESSENTIAL CHARACTERISTICS			PERFORMANCE						
Installation parameters			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
d_0	Nominal diameter of drill bit	[mm]	10	12	15	18	24	28	32
h_{nom}	Minimum installation depth	[mm]	60	70	80	100	115	145	165
h_{ef}	Effective anchorage depth	[mm]	49	59	67	88	99	125	150
h_{min}	Minimum thickness of the concrete member	[mm]	100	120	140	180	200	250	300
T_{inst}	Nominal torque moment	[Nm]	10	20	45	80	150	170	200
s_{min}	Minimum spacing	[mm]	50	60	70	80	100	125	150
for $c \geq$	Edge distance	[mm]	75	90	100	150	200	250	300
c_{min}	Minimum edge distance	[mm]	50	60	70	80	100	125	150
for $s \geq$	Anchor spacing	[mm]	75	90	100	150	200	250	300
Tension Steel failure									
$N_{Rk,s}$	Tension Steel characteristic failure	[kN]	16	29	46	67	126	203	293
$\gamma_{m,sN}$ [1]	Partial safety factor for tension steel failure	[-]	1,5						
Pull-out failure			M6	M8	M10	M12	M16	M20	M24
$N_{Rk,p,cr}$	Tension characteristic load in **cracked concrete** C20/25	[kN]	**9**	**12**	**16**	**25**	**35,5** [2]	**50,2** [2]	**66,1** [2]
$N_{Rk,p,ucr}$	Tension characteristic load in **un-cracked concrete** C20/25	[kN]	**16**	**22,8** [2]	**27,6** [2]	**41,6** [2]	**49,7** [2]	**70,4** [2]	**92,6** [2]
γ_2	Partial safety factor	[-]	1,0						
$\gamma_{m,c}$ [1]	Partial safety factor	[-]	1,5						
$\psi_{c\ C30/37}$	Increasing factor for concrete C30/37	[-]	1,22						
$\psi_{c\ C40/50}$	Increasing factor for concrete C40/50	[-]	1,41						
$\psi_{c\ C50/60}$	Increasing factor for concrete C50/60	[-]	1,55						
Concrete Cone and Splitting failure									
K_{cr}	Factor for cracked concrete ref. CEN/TS 1992-4-4 §. 6.2.1.4	[-]	7,2						
K_{ucr}	Factor for un-cracked concrete ref. CEN/TS 1992-4-4 §. 6.2.1.4	[-]	10,1						
$s_{cr,N}$	Critical spacing	[mm]	150	180	200	270	300	375	450
$c_{cr,N}$	Critical edge distance	[mm]	75	90	100	135	150	188	225
$s_{cr,sp}$	Critical spacing (splitting)	[mm]	150	180	200	270	300	375	450
$c_{cr,sp}$	Critical edge distance(splitting)	[mm]	75	90	100	135	150	188	225
$\gamma_{m,c}$ [1]	Partial safety factor	[-]	1,5						
Displacement on Tension Load			M6	M8	M10	M12	M16	M20	M24
N_{cr}	Service tension load in cracked concrete C20/25	[kN]	**4,3**	**5,7**	**7,6**	**11,9**	**16,9**	**23,9**	**31,5**
$\delta_{N0,cr}$	Short term displacement under tension load	[mm]	1,21	0,83	1,25	0,98	0,96	0,99	1,41
$\delta_{N\infty,cr}$	Long term displacement under tension load	[mm]	2,38	2,49	1,99	1,12	2,15	0,99	1,41
N_{ucr}	Service tension load in un-cracked concrete C20/25	[kN]	**7,7**	**10,9**	**13,2**	**19,8**	**23,6**	**33,6**	**44,2**
$\delta_{N0,ucr}$	Short term displacement under tension load	[mm]	0,47	0,81	0,30	0,25	0,20	2,08	2,45
$\delta_{N\infty,ucr}$	Long term displacement under tension load	[mm]	2,38	2,49	1,99	1,12	2,15	2,08	2,45
Shear Steel failure			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
$V_{Rk,s}$	Shear Steel characteristic failure	[kN]	**14**	**26**	**42**	**50**	**97**	**125**	**151**
$M^0_{Rk,s}$	Bending Moment characteristic failure	[Nm]	12	30	60	105	266	542	932
$\gamma_{m,sV}$ [1]	Partial safety factor for shear steel failure	[-]	1,25						
Shear Concrete Edge and Pry-out failure			M6	M8	M10	M12	M16	M20	M24
k	Factor equation (5.6) of ETAG, Annex C, § 5.2.3.3	[-]	1,0		2,0				
k_3	Factor equation (16) of CEN/TS 1992-4-4, § 6.2.2.3	[-]	1,0		2,0				
l_{ef}	Effective anchorage length	[mm]	49	59	67	88	99	125	150
d_{nom}	Nominal diameter of anchor	[mm]	10	12	15	18	24	28	32
γ_{mc} [1]	Partial safety factor	[-]	1,5						
Displacement on Shear Load			M6	M8	M10	M12	M16	M20	M24
V	Service shear load in concrete	[kN]	**8,0**	**14,9**	**24,0**	**28,6**	**55,4**	**71,4**	**86,3**
δ_{V0}	Short term displacement under shear load	[mm]	1,39	1,94	2,71	1,69	2,69	7,84	8,87
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	2,09	2,91	4,07	2,54	4,04	11,76	13,31

[1] In absence of other national regulations;
[2] Pull-out failure not decisive.

ANNEX II°

SEISMIC RESISTANCE Declared performances according to ETA-10/0423 - ETAG001 Annex E
Design Method according to TR045

ESSENTIAL CHARACTERISTICS			PERFORMANCE						
SEISMIC RESISTANCE Category C1			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
$N_{rk,p,seis\ C1}$	**Tension** char. load in concrete C20/25 for Seismic Category C1	[kN]	**6,8**	**12**	**16**	**25**	**35,5**[1]	**50,2**[1]	**66,1**[1]
$\gamma_{m,seisN}$ [2]	Partial safety factor for seismic actions for tension load	[-]	1,5						
$V_{rk,s,seis\ C1}$	**Shear** Steel characteristic failure Seismic for Category C1	[kN]	**9,8**	**13**	**20**	**20**	**48,5**	**87,5**	**105,7**
$\gamma_{m,seisV}$ [2]	Partial safety factor for seismic actions for shear load	[-]	1,25						
SEISMIC RESISTANCE Category C2			M6	M8	M10	M12	M16	M20	M24
$N_{rk,p,seis\ C2}$	**Tension** char. load in concrete C20/25 for Seismic Category C2	[kN]	-	**3,9**	**7,8**	**15,3**	**28,8**	**32,8**	**41,3**
$\gamma_{m,seisN}$ [2]	Partial safety factor for seismic actions for tension load	[-]	1,5						
$\delta_{N,sei\ (DSL)}$ [3] [4]	Displacement at DSL	[mm]	-	2,7	4,9	3,6	3,1	7,0	7,0
$\delta_{N,sei\ (USL)}$ [3] [4]	Displacement at USL	[mm]	-	12,8	15,2	14,0	11,5	18,4	16,2
$\gamma_{m,seisN}$ [2]	Partial safety factor for seismic actions for tension load	[-]	1,5						
$V_{rk,s,seis\ C2}$	**Shear** Steel characteristic failure Seismic for Category C2	[kN]	-	**10,2**	**17,0**	**17,0**	**43,9**	**72,9**	**74,6**
$\gamma_{m,seisV}$ [2]	Partial safety factor for seismic actions for shear load	[-]	1,25						
$\delta_{V,sei\ (DSL)}$ [3] [4]	Displacement at DSL	[mm]	-	3,5	2,7	2,5	2,7	7,0	7,0
$\delta_{V,sei\ (USL)}$ [3] [4]	Displacement at USL	[mm]	-	6,8	6,3	5,8	6,1	20,9	18,6

[1] Pull-out failure not decisive
[2] The recommended partial safety factors under seismic action ($\gamma_{m,seis}$) are the same as for static loading;
[3] The listed displacement represent mean values;
[4] A smaller displacement may be required in the design in the case of displacement sensitive fastenings or "rigid" supports;
The characteristic resistance associated with such smaller displacement may be determined by linear interpolation or proportional reduction.

FIRE RESISTANCE Declared performances according to ETA-10/0423
Design Method according to TR020

ESSENTIAL CHARACTERISTICS			PERFORMANCE						
Tension steel failure			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
$N_{Rk,s,fi,R30}$	Characteristic Tension Resistance = 30 min.	[kN]	0,20	0,37	0,87	1,69	3,14	4,90	7,06
$N_{Rk,s,fi,R60}$	Characteristic Tension Resistance = 60 min.	[kN]	0,18	0,33	0,75	1,26	2,36	3,68	5,30
$N_{Rk,s,fi,R90}$	Characteristic Tension Resistance = 90 min.	[kN]	0,14	0,26	0,58	1,10	2,04	3,19	4,59
$N_{Rk,s,fi,R120}$	Characteristic Tension Resistance = 120 min.	[kN]	0,10	0,18	0,46	0,84	1,57	2,45	3,53
$S_{cr,N,fi}$	Critical spacing under fire exposure	[mm]	$4xh_{ef}$						
$C_{cr,N,fi}$	Critical edge distance under fire exposure	[mm]	$2xh_{ef}$						
s_{min}	Minimum spacing	[mm]	50	60	70	80	100	125	150
c_{min}	Minimum edge distance	[mm]	$c_{min} = 2\ h_{ef}$; if fire attack from more than one side, the edge distance of the anchor has to be ≥ 300mm and ≥ $2\ h_{ef}$						
$\gamma_{M,fi}$ [5]	Partial safety factor under fire exposure	[-]	1,0						
Shear steel failure without lever arm									
$V_{Rk,s,fi,R30}$	Characteristic Shear Resistance = 30 min.	[kN]	0,20	0,37	0,87	1,69	3,14	4,90	7,06
$V_{Rk,s,fi,R60}$	Characteristic Shear Resistance = 60 min.	[kN]	0,18	0,33	0,75	1,26	2,36	3,68	5,30
$V_{Rk,s,fi,R90}$	Characteristic Shear Resistance = 90 min.	[kN]	0,14	0,26	0,58	1,10	2,04	3,19	4,59
$V_{Rk,s,fi,R120}$	Characteristic Shear Resistance = 120 min.	[kN]	0,10	0,18	0,46	0,84	1,57	2,45	3,53
Shear steel failure with lever arm									
$M^0_{Rk,s,fi,R30}$	Characteristic Bending Moment = 30 min.	[Nm]	0,15	0,37	1,12	2,62	6,66	13,07	22,45
$M^0_{Rk,s,fi,R60}$	Characteristic Bending Moment = 60 min.	[Nm]	0,14	0,34	0,97	1,96	5,00	9,80	16,84
$M^0_{Rk,s,fi,R90}$	Characteristic Bending Moment = 90 min.	[Nm]	0,11	0,26	0,75	1,70	4,33	8,49	14,59
$M^0_{Rk,s,fi,R120}$	Characteristic Bending Moment = 120 min.	[Nm]	0,08	0,19	0,60	1,31	3,33	5,44	9,35
Shear concrete pry-out failure									
k	Factor in equation (5.6) of ETAG001-Annex C § 5.2.3.3	[-]	1,0		2,0				
Shear concrete edge failure									
The characteristic resistance $V^0_{Rk,c,fi}$ in C20/25 to C50/60 concrete is determined by: $V^0_{Rk,c,fi} = 0,25 \times V^0_{Rk,c}$ (≤ R90) and $V^0_{Rk,c,fi} = 0,20 \times V^0_{Rk,c}$ (R120) with $V^0_{Rk,c}$ initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature acc. ETAG 001-Annex C, 5.2.3.4.									

[5] In absence of other national regulations.