



## Declaration of Performance

### ATS evo



Heavy duty safety bolt anchor made of galvanised steel

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

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

d <sup>5)</sup>	L <sup>6)</sup> [mm]	t <sub>fix</sub> <sup>7)</sup> [mm]	Marking	Cod. ATS evo-S (hexagonal head)	Cod. ATS evo-B (threaded bar)	d <sup>5)</sup>	t <sub>fix</sub> <sup>7)</sup> [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				
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	160	10	FM-ATS Ø28/10	79302b28160	79402b28160	M20			
	180	30	FM-ATS Ø28/30	79302b28180	79402b28180				
	210	60	FM-ATS Ø28/60	79302b28210	79402b28210				
	250	100	FM-ATS Ø28/100	79302b28250	79402b28250				
M24	180	10	FM-ATS Ø32/10	79302b32180	79402b32180	M24			
	200	30	FM-ATS Ø32/30	79302b32200	79402b32200				
	230	60	FM-ATS Ø32/60	79302b32230	79402b32230				

<sup>5)</sup> Nominal diameter of thread; <sup>6)</sup> Length of anchor; <sup>7)</sup> 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 <sub>[TAB]</sub>	1	ETA-10/0423	ETAG001 p.1-2-Annex E
Constancy of Performance & FPC	ZAG nr.1404 <sub>[NB]</sub>	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:

Name and functions	Signature	Place and date of issue
<b>Fabrizio Fasan</b> Sales Manager		San Giovanni al Natisone, 11-07-2016

## 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						
<b>Installation parameters</b>		<b>M6</b>	<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>
$d_0$	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
<b>for <math>c \geq</math></b>	Edge distance [mm]	75	90	100	150	200	250	300
$c_{min}$	Minimum edge distance [mm]	50	60	70	80	100	125	150
<b>for <math>s \geq</math></b>	Anchor spacing [mm]	75	90	100	150	200	250	300
<b>Tension Steel failure</b>								
$N_{Rk,s}$	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						
<b>Pull-out failure</b>		<b>M6</b>	<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>
$N_{Rk,p,cr}$	Tension characteristic load in <b>cracked concrete</b> C20/25 [kN]	<b>9</b>	<b>12</b>	<b>16</b>	<b>25</b>	<b>35,5<sup>2)</sup></b>	<b>50,2<sup>2)</sup></b>	<b>66,1<sup>2)</sup></b>
$N_{Rk,p,ucr}$	Tension characteristic load in <b>un-cracked concrete</b> C20/25 [kN]	<b>16</b>	<b>22,8<sup>2)</sup></b>	<b>27,6<sup>2)</sup></b>	<b>41,6<sup>2)</sup></b>	<b>49,7<sup>2)</sup></b>	<b>70,4<sup>2)</sup></b>	<b>92,6<sup>2)</sup></b>
$\gamma_2$	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						
<b>Concrete Cone and Splitting failure</b>								
$K_{cr}$	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						
<b>Displacement on Tension Load</b>		<b>M6</b>	<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>
$N_{cr}$	Service tension load in cracked concrete C20/25 [kN]	<b>4,3</b>	<b>5,7</b>	<b>7,6</b>	<b>11,9</b>	<b>16,9</b>	<b>23,9</b>	<b>31,5</b>
$\delta_{NO,cr}$	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]	<b>7,7</b>	<b>10,9</b>	<b>13,2</b>	<b>19,8</b>	<b>23,6</b>	<b>33,6</b>	<b>44,2</b>
$\delta_{NO,ucr}$	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
<b>Shear Steel failure</b>		<b>M6</b>	<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>
$V_{Rk,s}$	Shear Steel characteristic failure [kN]	<b>14</b>	<b>26</b>	<b>42</b>	<b>50</b>	<b>97</b>	<b>125</b>	<b>151</b>
$M^0_{Rk,s}$	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						
<b>Shear Concrete Edge and Pry-out failure</b>		<b>M6</b>	<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>
$k$	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
$\gamma_{mc}^{1)}$	Partial safety factor [-]	1,5						
<b>Displacement on Shear Load</b>		<b>M6</b>	<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>
$V$	Service shear load in concrete [kN]	<b>8,0</b>	<b>14,9</b>	<b>24,0</b>	<b>28,6</b>	<b>55,4</b>	<b>71,4</b>	<b>86,3</b>
$\delta_{V0}$	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

<sup>1)</sup> In absence of other national regulations,<sup>2)</sup> 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 <sup>1)</sup>	50,2 <sup>1)</sup>	66,1 <sup>1)</sup>
$V_{rk,s,seis C1}$	Shear Steel characteristic failure Seismic for Category C1	[kN]	9,8	13	20	20	48,5	87,5	105,7
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
$V_{rk,s,seis C2}$	Shear Steel characteristic failure Seismic for Category C2	[kN]	-	10,2	17,0	17,0	43,9	72,9	74,6
$\gamma_{m,seisN}$ <sup>2)</sup>	Partial safety factor for seismic actions for tension load	[-]	1,5						
$\gamma_{m,seisV}$ <sup>2)</sup>	Partial safety factor for seismic actions for shear load	[-]	1,25						

<sup>1)</sup> Pull-out failure not decisive,<sup>2)</sup> The safety factors recommended under seismic actions are being taken into account the same as the static action.**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 <sub>ef</sub>						
$C_{cr,N,fi}$	Critical edge distance under fire exposure	[mm]	2xh <sub>ef</sub>						
$S_{min}$	Minimum spacing	[mm]	50	60	70	80	100	125	150
$C_{min}$	Minimum edge distance	[mm]	C <sub>min</sub> = 2 h <sub>ef</sub> ; if fire attack from more than one side, the edge distance of the anchor has to be ≥ 300mm and ≥ 2 h <sub>ef</sub>						
$\gamma_{M,fi}$ <sup>3)</sup>	Partial safety factor under fire exposure	[-]	1,0						
Shear steel failure without lever arm			M6	M8	M10	M12	M16	M20	M24
$V_{Rk,s,fi,R30}$	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			M6	M8	M10	M12	M16	M20	M24
$M^0_{Rk,s,fi,R30}$	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			M6	M8	M10	M12	M16	M20	M24
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: $V^0_{Rk,c,fi} = 0,25 \times V^0_{Rk,c} (\leq R90)$ 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.						

<sup>3)</sup> In absence of other national regulations, under fire exposure is recommended the safety factor  $\gamma_{M,fi} = 1,0$ .