

# Declaration of Performance

**DoP nr. clr**

Concrete screw made of galvanised steel (hex head with built-in washer)



1. Identification of the product:

**CLR**

2. Identification code (art. 11.4), for the batch or serial number see packaging (see "BETOFAST" on ETA-16/0177):

d <sub>o</sub> <sup>1)</sup>	L <sup>2)</sup> [mm]	Thickness fixture <sup>3)</sup> [mm]			Marking	Cod.
		t <sub>fix,3</sub>	t <sub>fix,2</sub>	t <sub>fix,1</sub>		
8	60	15	10	-	LR 10x60	72005b10060
	75	30	25	10	LR 10x75	72005b10075
	100	55	50	35	LR 10x100	72005b10100
	130	85	80	65	LR 10x130	72005b10130
	150	105	100	85	LR 10x150	72005b10150
10	60	10	-	-	LR 12x60	72005b12060
	75	25	15	-	LR 12x75	72005b12075
	100	50	40	25	LR 12x100	72005b12100
	130	80	70	55	LR 12x130	72005b12130
	150	100	90	75	LR 12x150	72005b12150
12	75	25	15	-	LR 12x75	72005b14075
	100	50	40	5	LR 12x100	72005b14100
	130	80	70	35	LR 12x130	72005b14130
14	80	20	10	-	LR 16x80	72005b16080
	100	40	30	-	LR 16x100	72005b16100
	130	70	60	15	LR 16x130	72005b16130
	150	90	80	35	LR 16x150	72005b16150

<sup>1)</sup> Anchor size; <sup>2)</sup> Length of screw; <sup>3)</sup> Thickness fixture on different embedment depth, see Annex I\* ( $h_{nom,1} = t_{fix,1}$   $h_{nom,2} = t_{fix,2}$   $h_{nom,3} = t_{fix,3}$ )

3. Intended use:

Generic type	Concrete Screw for use in concrete
Base material	Cracked and un-cracked concrete C20/25 to C50/60 acc. to EN 206-1
Material	Steel cl. 10.9 acc. to EN ISO 898-1 galvanised acc. to EN ISO 4042 or EN ISO 12683
Durability	Internal dry conditions
Loading	Static, quasi-static
Fire Resistance	R120 acc.to TR020
Fire Reaction	A1 acc. to EN 13501-1

4. Manufacturer (art. 11.5):

**Friulside** 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 &amp; Notified Body:

	Name of Body	System of Assessment	Reference	EAD / hEN Document
Technical Specification Document	ITB <sub>[TAB]</sub>	1	<b>ETA-16/0177</b>	<b>ETAG001 p.1-3</b>
Constancy of Performance & FPC	ITB nr.1488 <sub>[NB]</sub>	1	1488-CPR-0552/W	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 Friulside SpA.

Signed for and behalf of the manufacturer by:

Function	Name	Signature	Place and date of issue
Technical Manager	Raffaele Palmieri		San Giovanni al Natisone, 08-04-2020



## ANNEX I\*

**Declared Performances acc. to ETA-16/0177 - ETAG001 p.1 and p.3**  
 Design method according to EN 1992-4:2018

ESSENTIAL CHARACTERISTICS		PERFORMANCE											
<b>Installation parameters</b>		<b>8</b>			<b>10</b>			<b>12</b>			<b>14</b>		
<b>d<sub>0</sub></b>	Nominal diameter of drill bit [mm]	8			10			12			14		
<b>h<sub>nom</sub></b>	Minimum installation depth [mm]	<u>45</u>	<u>50</u>	<u>65</u>	<u>50</u>	<u>60</u>	<u>75</u>	<u>50</u>	<u>60</u>	<u>95</u>	<u>60</u>	<u>70</u>	<u>115</u>
		h <sub>nom,1</sub>	h <sub>nom,2</sub>	h <sub>nom,3</sub>	h <sub>nom,1</sub>	h <sub>nom,2</sub>	h <sub>nom,3</sub>	h <sub>nom,1</sub>	h <sub>nom,2</sub>	h <sub>nom,3</sub>	h <sub>nom,1</sub>	h <sub>nom,2</sub>	h <sub>nom,3</sub>
<b>h<sub>ef</sub></b>	Effective anchorage depth [mm]	30	34	47	33	42	54	33	42	71	40	48	86
<b>h<sub>min</sub></b>	Minimum thickness of the concrete member [mm]	110			110			130			150		
<b>s<sub>min</sub></b>	Minimum spacing [mm]	60			70			80			90		
<b>c<sub>min</sub></b>	Minimum edge distance [mm]	60			70			80			90		
<b>Tension Steel failure</b>		8			10			12			14		
<b>N<sub>Rk,s</sub></b>	Tension Steel characteristic failure [kN]	42,4			67,2			99,4			134,0		
<b>γ<sub>m,sN</sub><sup>1)</sup></b>	Partial safety factor for tension steel failure [-]	1,4											
<b>Pull-out failure</b>		8			10			12			14		
<b>N<sub>Rk,p,cr</sub></b>	Tension characteristic load in cracked concrete C20/25 [kN]	3	4	7,5	4	6	9	4	6	16	5	7,5	20
<b>N<sub>Rk,p,ucr</sub></b>	Tension characteristic load in un-cracked concrete C20/25 [kN]	6	6	12	6	9	16	6	9	25	9	12	35
<b>γ<sub>inst</sub></b>	Partial safety factor [-]	1,2											
<b>γ<sub>m,p</sub><sup>1)</sup></b>	Partial safety factor [-]	1,8											
<b>Ψ<sub>C C30/37</sub></b>	Increasing factor for concrete C30/37 [-]	1,17			1,17			1,17			1,22		
<b>Ψ<sub>C C40/50</sub></b>	Increasing factor for concrete C40/50 [-]	1,32			1,32			1,32			1,41		
<b>Ψ<sub>C C50/60</sub></b>	Increasing factor for concrete C50/60 [-]	1,42			1,42			1,42			1,55		
<b>Concrete Cone and Splitting failure</b>		8			10			12			14		
<b>h<sub>ef</sub></b>	Effective anchorage depth [mm]	30	34	47	33	42	54	33	42	71	40	48	86
<b>s<sub>cr,N</sub></b>	Critical spacing [mm]	90	102	141	100	124	162	100	124	213	118	144	258
<b>c<sub>cr,N</sub></b>	Critical edge distance [mm]	45	51	71	50	62	81	50	62	107	59	72	129
<b>s<sub>cr,sp</sub></b>	Critical spacing (splitting) [mm]	90	102	141	100	124	162	100	124	213	118	144	258
<b>c<sub>cr,sp</sub></b>	Critical edge distance (splitting) [mm]	45	51	71	50	62	81	50	62	107	59	72	129
<b>Displacement on Tension Load</b>		8			10			12			14		
<b>N<sub>cr</sub></b>	Service tension load in cracked concrete C20/25 [kN]	-	-	3,0	-	-	3,6	-	-	6,9	-	-	7,9
<b>δ<sub>NO,cr</sub></b>	Short term displacement under tension load [mm]	-	-	0,4	-	-	0,5	-	-	0,5	-	-	0,6
<b>δ<sub>N=,cr</sub></b>	Long term displacement under tension load [mm]	-	-	2,0	-	-	2,0	-	-	2,0	-	-	2,0
<b>N<sub>ucr</sub></b>	Service tension load in un-cracked concrete C20/25 [kN]	-	-	4,8	-	-	6,3	-	-	12,6	-	-	13,9
<b>δ<sub>NO,ucr</sub></b>	Short term displacement under tension load [mm]	-	-	0,3	-	-	0,4	-	-	0,4	-	-	0,6
<b>δ<sub>N=,ucr</sub></b>	Long term displacement under tension load [mm]	-	-	1,4	-	-	1,5	-	-	1,8	-	-	1,9
<b>Shear Steel failure</b>		8			10			12			14		
<b>h<sub>nom</sub></b>	Minimum installation depth [mm]	<u>45</u>	<u>50</u>	<u>65</u>	<u>50</u>	<u>60</u>	<u>75</u>	<u>50</u>	<u>60</u>	<u>95</u>	<u>60</u>	<u>70</u>	<u>115</u>
<b>V<sub>Rk,s</sub></b>	Shear Steel characteristic failure [kN]	17,0			26,9			39,8			53,5		
<b>M<sup>0</sup><sub>Rk,s</sub></b>	Bending Moment characteristic failure [Nm]	46,8			93,2			167,7			261,8		
<b>γ<sub>m,sV</sub><sup>1)</sup></b>	Partial safety factor for shear steel failure [-]	1,5											
<b>Shear Concrete Pry-out failure</b>		8			10			12			14		
<b>K<sub>8</sub></b>	Factor acc. to EN 1992-4 § 7.2.2.4 [-]	1,0			1,0			2,0			2,0		
<b>Shear Concrete Edge failure</b>		8			10			12			14		
<b>l<sub>ef</sub></b>	Effective anchorage length [mm]	30	34	47	33	42	54	33	42	71	40	48	86
<b>d<sub>nom</sub></b>	Nominal diameter of anchor [mm]	8			10			12			14		
<b>γ<sub>mc</sub><sup>1)</sup></b>	Partial safety factor [-]	1,5											
<b>Displacement on Shear Load</b>		8			10			12			14		
<b>V</b>	Service shear load in concrete [kN]	6,9			11,0			15,0			15,5		
<b>δ<sub>V0</sub></b>	Short term displacement under shear load [mm]	1,5			1,7			2,0			2,7		
<b>δ<sub>V=</sub></b>	Long term displacement under shear load [mm]	2,3			2,6			3,0			4,1		

<sup>1)</sup> In absence of other national regulations.



**ANNEX II\*****FIRE RESISTANCE Declared Performances acc.to ETA-16/0177**

Design Method according to EN 1992-4:2018

ESSENTIAL CHARACTERISTICS			PERFORMANCE			
<b>Tension steel failure</b>			<b>8</b>	<b>10</b>	<b>12</b>	<b>14</b>
<b>h<sub>nom</sub></b>	Minimum installation depth	[mm]	<u>65</u>	<u>75</u>	<u>95</u>	<u>115</u>
<b>N<sub>Rk,s,fi,R30</sub></b>	Characteristic Tension Resistance = 30 min.	[kN]	0,64	1,34	1,99	2,68
<b>N<sub>Rk,s,fi,R60</sub></b>	Characteristic Tension Resistance = 60 min.	[kN]	0,55	1,01	1,49	2,01
<b>N<sub>Rk,s,fi,R90</sub></b>	Characteristic Tension Resistance = 90 min.	[kN]	0,42	0,87	1,29	1,74
<b>N<sub>Rk,s,fi,R120</sub></b>	Characteristic Tension Resistance = 120 min.	[kN]	0,34	0,67	0,99	1,34
<b>S<sub>cr,N,fi</sub></b>	Critical spacing under fire exposure	[mm]	4xh <sub>ef</sub>			
<b>C<sub>cr,N,fi</sub></b>	Critical edge distance under fire exposure	[mm]	2xh <sub>ef</sub>			
<b>γ<sub>M,fi</sub><sup>1)</sup></b>	Partial safety factor under fire exposure	[-]	1,0			
<b>Shear steel failure without lever arm</b>			<b>8</b>	<b>10</b>	<b>12</b>	<b>14</b>
<b>h<sub>nom</sub></b>	Minimum installation depth	[mm]	<u>65</u>	<u>75</u>	<u>95</u>	<u>115</u>
<b>V<sub>Rk,s,fi,R30</sub></b>	Characteristic Shear Resistance = 30 min.	[kN]	0,64	1,34	1,99	2,68
<b>V<sub>Rk,s,fi,R60</sub></b>	Characteristic Shear Resistance = 60 min.	[kN]	0,55	1,01	1,49	2,01
<b>V<sub>Rk,s,fi,R90</sub></b>	Characteristic Shear Resistance = 90 min.	[kN]	0,42	0,87	1,29	1,74
<b>V<sub>Rk,s,fi,R120</sub></b>	Characteristic Shear Resistance = 120 min.	[kN]	0,34	0,67	0,99	1,34
<b>Shear steel failure with lever arm</b>						
<b>M<sup>0</sup><sub>Rk,s,fi,R30</sub></b>	Characteristic Bending Moment = 30 min.	[Nm]	0,70	1,86	3,36	5,24
<b>M<sup>0</sup><sub>Rk,s,fi,R60</sub></b>	Characteristic Bending Moment = 60 min.	[Nm]	0,61	1,40	5,52	3,93
<b>M<sup>0</sup><sub>Rk,s,fi,R90</sub></b>	Characteristic Bending Moment = 90 min.	[Nm]	0,47	1,21	2,18	3,40
<b>M<sup>0</sup><sub>Rk,s,fi,R120</sub></b>	Characteristic Bending Moment = 120 min.	[Nm]	0,37	0,93	1,68	2,62
<b>Shear concrete pry-out failure</b>						
<b>k</b>	Factor acc. to EN 1992-4	[-]	1,0	1,0	2,0	2,0
<b>Shear concrete edge failure</b>						
The characteristic resistance V <sup>0</sup> <sub>Rk,c,fi</sub> in C20/25 to C50/60 concrete is determined by:						
V <sup>0</sup> <sub>Rk,c,fi</sub> = 0,25 × V <sup>0</sup> <sub>Rk,c</sub> (≤ R90) and V <sup>0</sup> <sub>Rk,c,fi</sub> = 0,20 × V <sup>0</sup> <sub>Rk,c</sub> (R120)						
with V <sup>0</sup> <sub>Rk,c</sub> initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature acc. to EN 1992-4						

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