

Torggler

Anchoring and Mounting

XTREME GRIP VINYLESTER

Two-component vinylester resin-based chemical anchor without styrene for structural fixings on cracked/un-cracked concrete, solid and perforated brick masonry, wood.



- CE marked and qualified according to the European Technical Assessment (ETA) for anchors on cracked and non-cracked concrete
- Certified for works in seismic category C1 and C2.
- Also suitable for fixings on hollow elements, solid masonry and timber
- Quick commissioning
- Suitable for use on wet substrates or with flooded hole
- Substrate temperatures during installation: from -10 °C to +40 °C
- Fire resistant up to maximum R240
- Possibility of sinking the anchoring hole to a depth of up to 1 metre
- Easy penetration into porous and hollow areas
- Secure fastening without expansion and without tension in the substrate



APPLICATION AREAS

Combined with threaded rods or improved adhesion rods, it can be used for many cases of heavy load fastening or where, due to the presence of critical temperatures (< 0 °C or > 30 °C), the use of other types of anchors is impossible. Thanks to its styrene-free chemistry it can be used in closed environments as well.

- Metal frames and constructions in general
- ventilated façades
- emergency stairs
- canopies and cantilevered fixings in general
- lifts, elevators and lifting fixtures
- lifelines
- airtight/watertight barriers
- gangways
- seismic area consolidations
- attic/floor reinforcements
- concrete casting joints with post-installed joint irons

FEATURES

Two-component, styrene-free, vinylester resin-based chemical anchoring agent for structural fixing of heavy loads on cracked/non-cracked concrete, solid and hollow brick masonry, timber. Thanks to its fast hardening, it can be used where there is a need for quick commissioning and in any case for anchors with a sinking depth of up to 1 metre. It can be applied even if the temperature of the substrate reaches critical values (-10 to +40 °C). In case of wet substrates and with flooded hole, the certification includes the use of threaded rods and in any case the loading time will be double. The product, depending on the diameter of threaded rods or improved adhesion rods used, is qualified according to the European Technical Assessment (ETA) for applications on cracked concrete (option 1), non-cracked concrete (option 7), even if the work falls under seismic category C1 C2.

WARNINGS

Do not use the product:

- for anchoring on holes made with a core drill
- on dusty or oil-contaminated surfaces, release agents, etc.
- for surface applications (with UV exposure)
- for creating joints close to cracks/fissures between plates
- for anchors with a sinking depth of more than 1 metre

In case of doubt, contact our Technical Department.

INSTRUCTIONS FOR USE

1. Drill a hole in the substrate, in orthogonal direction, respecting the prescribed drilling diameter and depth; rotary-percussion tools are recommended for compact substrates. Use a drill with simple rotation for hollow brick supports, in order not to break the internal baffles of the bricks.
2. Carefully remove the dust, or other residual material, from the hole using a blower pump or compressed air and metal brush: a suitable level of cleaning is obtained by performing at least 4 blows, 4 brushings and 4 blows in sequence. Before brushing, clean the brush and check that its diameter is sufficient.
3. Threaded rods or improved adhesion rods must be clean and free from oil, grease or rust.
4. For anchors more than 15 cm deep use a spout extension by cutting it to size.
5. For hollow brick substrates, insert the cage (or the wire mesh plug or wire braiding) into the hole to prevent the resin from subsequently being dispersed into the cavities.
6. If the hole is drilled at a point where the substrate is not drilled, for example on the mortar between two bricks, do not use the cage and perform the installation as on a compact substrate.
7. For the 300 ml cartridge: unscrew the cap, insert the mixer in the slot of the yellow extractor and pull so as to remove the metal clip closing the bag (for the 400 ml cartridge, simply unscrew the cap). Wearing adequate hand and face protective equipment, screw on the mixer and insert the cartridge into the dedicated gun.
8. Extrude the resin and discard the first part of the product that has not been perfectly mixed until the resin coming out is evenly coloured (usually the first 3-5 full pumps are discarded). For a reduced dispensing effort store the cartridges at a temperature between 15 and 25 °C
9. 9a. In case of compact substrates, inject the resin starting from the bottom, filling the hole for about 2/3 and going up with the mixer.
9b. In case of hollow brick supports, dispense a sufficient quantity of resin to make it come out from the mesh of the cage in an adequate quantity: to increase the seal, increase the quantity of extruded resin so that the bulb doubles.
10. For a better distribution of the anchoring agent and to allow the air bubbles, if any, to come out, insert the rod by screwing it in slightly after marking it with the correct anchor depth. When you see a slight excess of resin coming out, you can be assured that your anchor is perfect.
11. Remove excess resin from the hole either immediately with paper or mechanically with a chisel after hardening.
12. Depending on the different temperatures of the substrate, observe the installation and hardening times indicated below before clamping and loading. In case of flooded hole double the time.
13. If the resin inside the mixing spout is hardened, to use it again you will need a new mixer, always taking care to eliminate the first part of the unevenly coloured product (see point 8).

WAITING TIMES

Substrate temperature	Workability	Clamping and loading
40 °C	1 minute	20 minutes
30 °C	3 minutes	30 minutes
25 °C	5 minutes	35 minutes
20 °C	7 minutes and 30 seconds	40 minutes
10 °C	16 minutes	1 hour
5 °C	25 minutes	1 hour and 30 minutes
0 °C	45 minutes	7 hours
- 5 °C	1 hour and 5 minutes	14 hours
- 10 °C	1 hour and 45 minutes	24 hours
Double the loading time if submerged		

TECHNICAL SPECIFICATIONS

FIXING ON CONCRETE WITH THREADED RODS

The approval, according to EAD 330499-01-0601, is valid for a wide range of threaded rods (from M8 to M30) and for different anchoring depths even on wet concrete and with flooded hole.

The certified operating temperatures are within the ranges:

- from -40 °C to +40 °C with a maximum long-term temperature of 24 °C
- from -40 °C to +80 °C with a maximum long-term temperature of 50 °C
- from -40 °C to +120 °C with a maximum long-term temperature of 72 °C

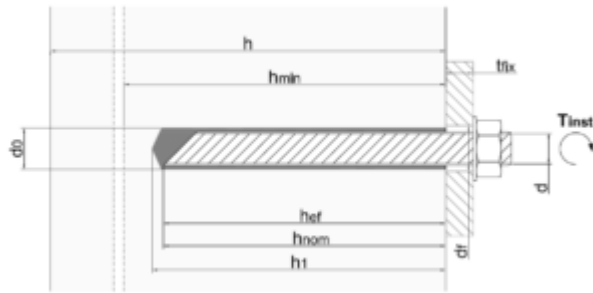
ETA-19/0842 Fixing of min. 5 µ grade 5.8 galvanized steel threaded rods on concrete C20/25										
Characteristic dimensions			M8	M10	M12	M16	M20	M24	M27	M30
d₀	Hole diameter	mm	10	12	14	18	24	28	30	35
T_{inst}	Tightening torque	Nm	10	20	40	80	130	200	250	280
S_w	Key	mm	13	17	19	24	30	36	41	46
d_f	Hole Ø in the object to be fixed	mm	9	12	14	18	22	26	30	33

Minimum anchoring depth										
Characteristic dimensions			M8	M10	M12	M16	M20	M24	M27	M30
h₁	Hole depth	mm	65	75	85	105	125	150	150	150
h_{nom}	Nominal anchoring depth	mm	60	70	80	100	120	145	145	145
h_{min}	Minimum thickness of base material	mm	100	100	110	136	168	201	210	220
S_{cr}	Hole centre distance	mm	180	210	240	300	360	435	435	435
C_{cr}	Distance from the edge	mm	90	105	120	150	180	218	218	218

S_{min}	Minimum hole centre distance	mm	40	50	60	75	100	115	120	140
C_{min}	Minimum distance from the edge	mm	40	50	60	75	100	115	120	140

Average anchoring depth										
Characteristic dimensions			M8	M10	M12	M16	M20	M24	M27	M30
h₁	Hole depth	mm	85	95	115	130	175	215	245	275
h_{nom}	Nominal anchoring depth	mm	80	90	110	125	170	210	240	270
h_{min}	Minimum thickness of base material	mm	100	114	138	161	218	266	300	340
S_{cr}	Hole centre distance	mm	240	270	330	375	510	630	720	810
C_{cr}	Distance from the edge	mm	120	135	165	187	255	315	360	405
S_{min}	Minimum hole centre distance	mm	40	50	60	75	100	115	120	140
C_{min}	Minimum distance from the edge	mm	40	50	60	75	100	115	120	140

Maximum anchoring depth										
Characteristic dimensions			M8	M10	M12	M16	M20	M24	M27	M30
h₁	Hole depth	mm	165	205	245	325	405	485	545	605
h_{nom}	Nominal anchoring depth	mm	160	200	240	320	400	480	540	600
h_{min}	Minimum thickness of base material	mm	180	224	268	356	448	536	600	670
S_{cr}	Hole centre distance	mm	480	600	720	960	1200	1440	1620	1800
C_{cr}	Distance from the edge	mm	240	300	360	480	600	720	810	900
S_{min}	Minimum hole centre distance	mm	40	50	60	75	100	115	120	140
C_{min}	Minimum distance from the edge	mm	40	50	60	75	100	115	120	140



Minimum anchoring depth									
Global safety factor applied									
Fixing on non-cracked concrete C20/25 with grade 5.8 threaded rods									
		M8	M10	M12	M16	M20	M24	M27	M30
Traction	kN	9,0	12,0	17,0	24,0	31,6	41,9	42,0	42,0
Shear	kN	5,4	8,6	12,5	23,3	36,3	52,5	68,2	83,4

Average anchoring depth									
Global safety factor applied									
Fixing on non-cracked concrete C20/25 with grade 5.8 threaded rods									
		M8	M10	M12	M16	M20	M24	M27	M30
Traction	kN	9,0	12,0	17,0	24,0	31,6	41,9	42,0	42,0
Shear	kN	5,4	8,6	12,5	23,3	36,3	52,5	68,2	83,4

Maximum anchoring depth									
Global safety factor applied									
Fixing on non-cracked concrete C20/25 with grade 8.8 threaded rods									
		M8	M10	M12	M16	M20	M24	M27	M30
Traction	kN	13,9	22,1	32,1	59,5	96,6	139,5	180,6	220,5
Shear	kN	8,3	13,2	19,2	35,7	58,0	83,7	108,8	133,1

- Loads valid for operating temperatures ranging from -40°C to $+40^{\circ}\text{C}$
- Loads per single anchoring agent irrespective of hole centre distance, edge distance and concrete thickness $\geq 2h_{ef}$
- Shear action not directed towards the edge
- With flooded hole, 20% load reduction

Minimum anchoring depth						
Global safety factor applied						
Fixing on cracked concrete C20/25 with grade 5.8 threaded rods						
			M10	M12	M16	M20
Traction		kN	9,1	12,2	17,1	22,5
Shear		kN	8,6	12,5	23,3	34,3

Average anchoring depth					
Coefficiente di sicurezza globale applicato					
Fissaggio su CALCESTRUZZO C20/25 FESSURATO con barre filettate classe 5.8					
		M10	M12	M16	M20
Traction	kN	11,7	17,8	23,9	33,8
Shear	kN	8,6	12,5	23,3	36,2

Maximum anchoring depth					
Global safety factor applied					
Fixing on cracked concrete C20/25 with grade 8.8 threaded rods					
		M10	M12	M16	M20
Traction	kN	22,1	32,1	59,5	79,5
Shear	kN	13,2	19,2	35,7	58,0

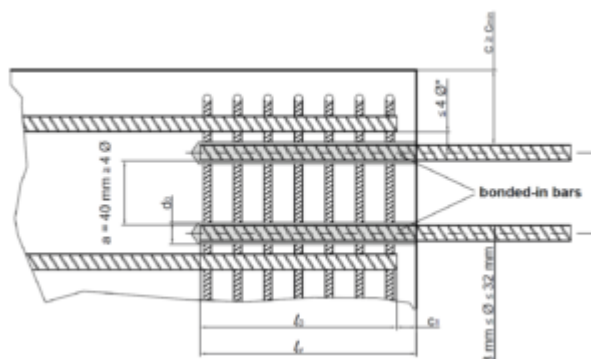
- Loads valid for operating temperatures ranging from -40°C to +40°C
- Loads per single anchoring agent irrespective of hole centre distance, edge distance and concrete thickness $\geq 2h_{ef}$
- Shear action not directed towards the edge
- With flooded hole, 20% load reduction

ETA-19/0841	Fixing of improved adhesion rods on concrete								
Reinforcing rod diameter (mm)	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Hole diameter (mm)	12	14	16	18	20	25	30	35	40
Maximum installation depth (mm)	400	500	600	700	800	1000	1000	1000	1000

Minimum concrete cover: $c_{min} = 30 \text{ mm} + 0,06 l_v \geq 2 \cdot \emptyset$ per $\emptyset < 25 \text{ mm}$

$c_{min} = 40 \text{ mm} + 0,06 l_v \geq 2 \cdot \emptyset$ per $\emptyset \geq 25 \text{ mm}$

Minimum hole centre distance between two post-installed rods: $a = 40 \text{ mm} \geq 4 \cdot \emptyset$



PROJECT LOADS – OF REBARS AS CONCRETE CASTING JOINTS

ETA-19/0841, PROJECT LOADS – OF REBARS AS CONCRETE CASTING JOINTS

Pre-calculated values for rebars anchoring.

Example of anchor length ¹⁾ with rods ($f_{y,k} = 500 \text{ N/mm}^2$) on concrete C20/25 ($f_{bd} = 2.3 \text{ N/mm}^2$).

¹⁾ The values given in the table refer to good adhesion conditions according to EN 1992-1-1. For all other conditions, multiply the values by 0.7.

²⁾ The resin value can be estimated according to the equation $V = l_b \pi (d_0^2 - d_2^2) / (4 \times 0.85)$.

		$a_1 = a_2 = a_3 = a_4 = a_5 = 1,0$			$a_1 = a_3 = a_4 = 1,0$ e a_2 o $a_5 = 0,7$		
Rods \emptyset	Tensile load for rods Bst 500	Anchor length l_{bd}	Tensile load	Volume of resin $v^2)$	Anchor length l_{bd}	Tensile load	Volume of resin $v^2)$
[mm]	[kN]	[mm]	[kN]	[ml]	[mm]	[kN]	[ml]
8	21,85	115	6,65	8,50	115	9,50	8,50
		180	10,40	13,31	180	14,86	13,31
		250	14,45	18,48	200	16,52	14,78
		320	18,50	23,65	220	18,17	16,26
		378	21,85	27,95	265	21,85	19,56
10	34,15	145	10,48	12,86	145	14,97	12,86
		230	16,62	20,40	230	23,74	20,40
		310	22,40	27,50	260	26,84	23,06
		390	28,18	34,59	290	29,93	25,72
		473	34,15	41,92	331	34,15	29,34
12	49,17	170	14,74	17,59	170	21,06	17,59
		270	23,41	27,94	270	33,44	27,94
		370	32,08	38,29	300	37,16	31,05
		470	40,75	48,64	300	40,88	34,15
		567	49,17	58,69	397	49,17	41,08
14	66,93	200	20,23	23,65	200	28,90	23,65
		320	32,37	37,85	320	46,24	37,85
		440	44,51	52,04	360	52,02	42,58
		560	56,65	66,23	400	57,81	47,31
		662	66,93	78,25	463	66,93	54,78
16	87,42	230	26,59	30,60	230	37,99	30,60
		360	41,62	47,90	360	59,46	47,90
		490	56,65	65,20	400	66,06	53,22
		620	71,68	82,49	440	72,67	58,54
		756	87,42	100,61	529	87,42	70,43
20	136,59	285	41,19	59,25	285	58,84	59,25
		450	65,03	93,55	450	92,90	93,55
		620	89,60	128,90	500	103,22	103,95
		790	114,17	164,24	550	113,55	114,34
		945	136,59	196,50	662	136,59	137,55
25	213,42	355	64,13	90,21	355	91,61	90,21
		520	93,93	132,13	520	134,19	132,13
		680	122,84	172,79	600	154,84	152,46

		840	151,74	213,44	650	167,74	165,16
		1000	180,64	254,10	700	180,64	177,87
28	267,72	400	80,93	162,99	400	115,61	162,99
		550	111,28	224,12	550	158,96	224,12
		700	141,62	285,24	700	202,32	285,24
		850	171,97	346,36	850	245,67	346,36
		1000	202,32	407,48	926	267,72	377,44
32	349,67	455	105,21	242,16	455	150,29	242,16
		590	136,42	314,01	500	165,16	266,11
		730	168,79	388,52	550	181,67	292,72
		870	201,16	463,03	600	198,19	319,33
		1000	231,22	532,22	700	231,22	372,56

ETA-19/0841, PROJECT LOADS – OF REBARS AS OVERLAPS

Pre-calculated values for rebars overlapping.

Example of overlap length ¹⁾ with rods ($f_{y,k} = 500 \text{ N/mm}^2$) on concrete C20/25 ($f_{bd} = 2.3 \text{ N/mm}^2$)

¹⁾ The values given in the table refer to good adhesion conditions according to EN 1992-1-1. For all other conditions, multiply the values by 0.7.

²⁾ The resin value can be estimated according to the equation $V = l_b \cdot n \cdot (d_0^2 - d^2) / (4 \times 0.85)$

		$a_1 = a_2 = a_3 = a_4 = a_5 = 1,0$			$a_1 = a_3 = a_4 = 1,0$ e e a_2 o $a_5 = 0,7$		
Rods \emptyset	Tensile load for rods Bst 500	Anchor length l_{bd}	Tensile load	Volume of resin $v^2)$	Anchor length l_{bd}	Tensile load	Volume of resin $v^2)$
[mm]	[kN]	[mm]	[kN]	[ml]	[mm]	[kN]	[ml]
8	21,85	200	11,56	14,78	200	16,52	14,78
		240	13,87	17,74	–	–	–
		280	16,19	20,70	–	–	–
		320	18,50	23,65	–	–	–
		378	21,85	27,95	–	–	–
10	34,15	200	14,45	17,74	200	20,64	17,74
		270	19,51	23,95	235	24,26	20,85
		340	24,57	30,16	270	27,87	23,95
		410	29,63	36,37	305	31,48	27,05
		473	34,15	41,92	331	34,15	29,34
12	49,17	200	17,34	20,70	200	24,77	20,70
		290	25,15	30,01	250	30,97	25,87
		380	132,95	39,33	300	37,16	31,05
		470	40,75	48,64	350	43,35	36,22
		567	49,17	58,69	397	49,17	41,08
14	66,93	210	21,24	24,84	210	30,35	24,84
		320	32,37	37,85	270	39,02	31,93
		430	43,50	50,86	330	47,69	39,03
		540	54,63	63,87	390	56,36	46,13

		662	66,93	78,25	463	66,93	54,78
		240	27,75	31,93	240	39,64	31,93
16	87,42	370	42,78	49,23	310	51,20	41,25
		500	57,81	66,53	380	62,76	50,56
		630	72,83	83,83	450	74,32	59,88
		756	87,42	100,61	529	87,42	70,43
		300	43,35	62,37	300	61,93	62,37
20	136,59	460	66,48	95,63	390	80,51	81,08
		620	89,60	128,90	480	99,09	99,79
		780	112,72	162,16	570	117,68	118,50
		945	136,59	196,50	662	136,59	137,55
		375	67,74	95,29	375	96,77	95,29
25	213,42	530	95,74	134,67	670	172,90	170,25
		690	124,64	175,33	780	201,29	198,20
		850	153,55	215,98	800	206,45	203,28
		1000	180,64	254,10	827	213,42	210,14
		420	84,97	171,14	420	121,39	171,14
28	267,72	570	115,32	232,27	720	208,10	293,39
		720	145,67	293,39	810	234,11	330,06
		870	176,02	354,51	900	260,12	366,73
		1000	202,32	407,48	926	267,72	377,44
		480	110,99	255,47	480	158,55	255,47
32	349,67	610	141,04	324,66	610	201,49	324,66
		740	171,10	393,84	740	244,43	393,84
		870	201,16	463,03	870	287,37	463,03
		1000	231,22	532,22	1000	330,32	532,22

ANCHORAGE ON WOOD

- Glulam samples with mechanical strength class GL24h according to EN 14080
- Temperature in the test room +20 °C
- Drilling in a direction perpendicular to the wood fibres
- Permissible load data recommended for applications on materials with medium mechanical properties.
- The values given are the result of laboratory tests carried out under the specified conditions in accordance with the installation instructions
- Loads valid for single anchor without centre distance influence $h \geq 2 h_{ef}$
- Global safety factor included
- For water-filled borehole, recommended load reduction of 20 %
- Due to the variety of timber supports, should the application be on other substrates not considered, an appropriate suitability test must be carried out beforehand

Installation data and permissible tensile load from the timber base						
Bar diameter d (mm)						
			M8 – Ø8	M10 – Ø10	M12 – Ø12	M16 – Ø16
h₁	Hole depth	(mm)	85	105	125	165
d₀	Hole diameter	(mm)	10 – 12	12 – 14	14 – 16	18 – 20
h_{nom}	Nominal anchoring depth	(mm)	80	100	120	160
h_{ef}	Effective anchoring depth	(mm)	80	100	120	160

h	Recommended substrate thickness	(mm)	160	200	240	320
s_{cr}	Dual spacing	(mm)	100	125	150	200
c_{cr}	Distance from edge	(mm)	80	100	120	160
S_{min}	Minimum hole centre distance	(mm)	50	50	60	80
C_{min}	Minimum distance from the edge	(mm)	50	50	60	80
t_{fix}	Maximum fixable thickness	(mm)	10	20	30	35
d_f	Hole diameter fixable thickness	(mm)	9	12	14	18
T_{nst}	Tightening torque	(mm)	7	15	25	30
N_{rec}	Permissible tensile load	(kN)	3,2	4,2	6,1	10,7

Packaging	cartridge
Bicomponent	2 components
Packaging size	12x300 ml, 12x400 ml
Pallet	52 cardboards, 72 cardboards

CONSUMPTION

Type and diameter of rod	Hole diameter (mm)	Anchoring hole depth (mm)	Number of fixings (300 ml)	Number of fixings (400 ml)	
Threaded rod	M8	10	85	± 60.5	± 81
	M10	12	95	± 37.5	± 50.5
	M12	14	115	± 23	± 30.5
	M14	16	115	± 17	± 22.5
	M16	18	130	± 12	± 16.5
	M18	20	130	± 8.5	± 11
	M20	24	175	± 5	± 7
	M22	26	190	± 4	± 5
	M24	28	215	± 3	± 4
	M27	30	245	± 2.5	± 3
	M30	35	275	± 1.5	± 2
	M33	37	300	± 1	± 1.5
	M36	40	300	± 1	± 1.5
Improved adhesion rods	M39	42	360	± 1	± 1
	Ø 8	12	80	± 42	± 56
	Ø 10	14	100	± 25	± 33.5
	Ø 12	16	120	± 16	± 21.5
	Ø 14	18	140	± 11	± 14.5
	Ø 16	20	160	± 8	± 10.5
Ø 18	22	180	± 6	± 7.5	

	Ø 20	25	200	± 4	± 5.5
	Ø 22	26	220	± 3.5	± 4.5
	Ø 24	28	240	± 2.5	± 3.5
	Ø 25	30	250	± 2	± 3
	Ø 26	32	260	± 2	± 2.5
	Ø 28	34	280	± 1.5	± 2
	Ø 30	37	300	± 1	± 1.5
	Ø 32	40	320	± 1	± 1.5
Fixings with cages in hollow bricks	M8	12	50	± 38.5	± 51.5
	M8	12	60	± 32.5	± 43.5
	M8	12	80	± 25	± 33.5
	M10	16	85	± 13.5	± 17.5
	M10	16	100	± 11.5	± 15
	M10	16	135	± 8.5	± 11.5
	M10	16	140	± 8	± 11
	M14	17	130	± 8	± 10.4
	M12	20	85	± 8.5	± 11.5
	M16	22	150	± 4	± 5.5
	M16	22	200	± 3	± 4
	M20	30	250	± 1.5	± 2

STORAGE

Store between +5 and +30 °C, away from UV rays. When stored in a dry and covered place in its original sealed packaging Xtreme Grip Vinylester is stable for:

- at least 12 months in 300 ml cartridges
- at least 16 months in 400 ml cartridges.

CERTIFICATIONS

CERTIFICAZIONI

VOC emissions class A+ according to French Decree no. 2011-321 and in compliance with ISO 16000/EN16516.


Qualified with European Technical Assessment (ETA 19/0842, DoP no. 134/19 NB 1488) according to EAD 330499-01-0601 for applications in:

- Option 1: cracked concrete – threaded rods M10-M20
- Option 7: non-cracked concrete – M8-M30 threaded rods
- Seismic category C1: threaded rods M12-M20
- Seismic category C2: threaded rods M12-M16

Qualified with European Technical Assessment (ETA 19/0841, DoP no. 135/19 NB 1488) according to EAD 330087-00-0601 and EAD 331522-00-0601 for applications in any seismic zone.

- post-installed connections in both cracked and non-cracked reinforced concrete using improved adhesion rods Ø 8 mm to Ø 32 mm

For details on permissible loads and installation requirements, see the tables at the end of this document



The performance declarations are available on request.

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