POINT 430 VINYL FIX
Vinylester resin styrene free

POINT 430 VINYL FIX is a bi-component vinylester styrene free chemical anchor for structural/ high loads, CE marked and ETA assessed for use in concrete. It is certified for threaded rods to be used in non-cracked concrete from diameters M8 to M30, in cracked concrete from diameters M10 to M20, in solid masonry from diameters M8 to M16, in hollow masonry from diameters M8 to M12 and in timber from diameters M8 to M16. It is certified for rebars to be used in non-cracked concrete from diameters Ø8 mm to Ø32 mm and for post-installed rebar connections in reinforced concrete for diameters from Ø8 mm to Ø32 mm. This resin has seismic qualification, fire resistance and chemical resistance. It can be used when base material temperature is between -10°C and +40°C. Suitable for use in wet concrete and flooded holes. Due to its strong adhesion and ease of penetration into holes and hollow materials, the resin allows a secure attachment without expansion and without stresses in the base material, which allows you to make fixings close to the corners and edges of base material.

Description:

ETA (European Technical Assessments) updated according to the Construction Product Regulation 305/2011.
ETA-09/0140: Assessment according to EAD-330499 for uncracked concrete, Option 7, for diameters from M8 to M30 and for rebars from Ø8 mm to Ø32 mm. Performace for cracked concrete, Option 1, with rod M10-M12- M16-M20.
Seismic qualification according to EOTA Technical Report TR049. The product is qualified in seismic category C1 for diameters M12-M16-M20 and seismic category C2 for diameters M12-M16. The product is homologated for fixings with a variable anchorage depth, to give the designer a high degree of flexibility. Maximum anchoring depth up to twenty times the nominal diameter of the threaded rod. Certified service temperatures are in the ranges: -40°C/+40°C (T° max long period = +24°C) ,-40°C/+80°C (T° max long period = +50°C) and -40°C/+120°C (T° max long period = +72°C).
ETA-09/0246: Assessment according to EAD-330087 for post-installed rebar connections in reinforced concrete for diameters from Ø8 mm to Ø32 mm. Minimum anchorage depth according to Eurocode 2 in case of uncracked and cracked concrete. Fire resistance, up to a maximum of R240. Assessment for seismic condition according to the EAD 331522 for diameters from Ø12 mm to Ø32 mm. Certified service temperatures are in the range: -40°C/+80°C (T° max long period = +50°C). Concrete category CI 0,4 max. Possibility of installing the anchor using hollow drill bits. This installation mode avoids the dust removal procedure by means of a blower pump and a metal brush, and thus significantly reduces the installation time. Possibility to use the product in dry, wet concrete and with flooded hole (flooded hole only with threaded bars). The product hardening reaction also takes place in the presence of water. Base material temperature (concrete, bricks, etc…) for installation should be between -10 °C and +40 °C.
Suitable also for base material like solid and hollow masonry, wood. VOC according to the French Decree 2011-321 and according to the standard ISO 16000/EN 16516.

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TECHNICAL DATA SHEET

Excellent adhesion to:

- Concrete
- Bricks
- Metal
- Wood

Advantages

- Plastic foil opening system.
- Fire resistance.
- Seismic certification.
- Wet concrete and flooded hole.
- Chemical resistance.
- Post-installed rebar.
- Cracked concrete.
- Styrene free.
- Overhead installation.
- Quick setting and curing times.
- The tube is reusable, it is enough to change the mixer.
- Suitable when base material temperature is between –10 °C and +40 °C.

Certification

09-1488 DoP nº: 09/0140 ETA-09/0140 EAD 330499-01-0601 OPTION 7 M8-M30/Ø 8-Ø32 OPTION 1 M10-M20 C1: M12-M20 C2: M12-M16	09-1488 CoP nº: 09/0246 ETA-09/0246 EAD 330087-00-0601 Ø 8-Ø32 Fire Ø 8-Ø32

ÉMISSIONS DANS L'AIR INTÉRIEUR A+ (A+ A B C)

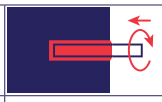
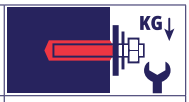
LEED TESTED

SEISMIC
C1: M12 - M20
C2: M12 - M16
REBAR ø12 - ø32

FIRE RESISTANCE
R240
REBAR ø8 - ø32

SUITABLE FOR UNDERWATER WORK

Setting times

Installation temperature		
40 °C	1 min.	20 min.
35 °C	2 min.	25 min.
30 °C	3 min.	30 min.
25 °C	5 min.	35 min.
20 °C	7,5 min.	40 min.
15 °C	11,5 min.	45 min.
10 °C	16 min.	1 hour
5 °C	25 min.	1 h 30 min.
0 °C	45 min.	7 hours
-5 °C *	65 min.	14 hours
-10 °C *	1 h 45 min.	24 hours
	in H_2O 2× curing time	

Minimum product temperature for application is +5 °C.

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Number of fixings

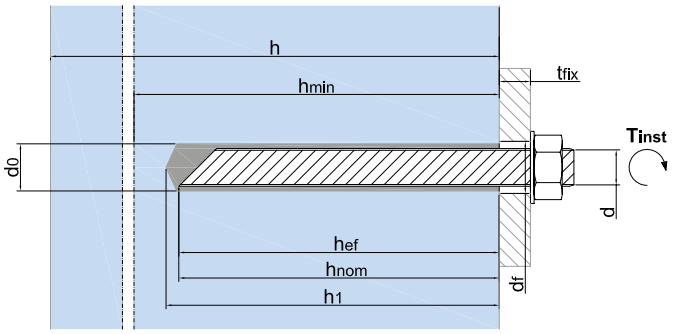
	Rod diameter	Hole diameter	Effective anchorage depth	300 ml	400 ml
	d [mm]	d_0 [mm]	h_{ef} [mm]	Numebr of fixing per cartridge	
	Fixings in solid materials				
	M 8	10	80	± 57,0	± 75,5
	M 10	12	90	± 38,5	± 51,5
	M 12	14	110	± 25,5	± 34,0
	M 14	16	115	± 20,0	± 26,5
	M 16	18	125	± 16,0	± 21,0
	M 18	20	150	± 11,0	± 14,5
	M 20	24	170	± 5,5	± 7,5
	M 22	26	190	± 4,5	± 6,0
	M 24	28	210	± 3,5	± 5,0
	M 27	30	240	± 3,5	± 4,5
	M 30	35	270	± 2,0	± 2,5
	M 33	37	300	± 2,0	± 2,5
	M 36	40	330	± 1,5	± 2,0
	M 39	42	360	± 1,5	± 2,0
	Fixings in solid materials				
	∅ 8	12	80	± 35,0	± 47,0
	∅ 10	14	100	± 23,5	± 31,0
	∅ 12	16	120	± 16,5	± 22,5
	∅ 14	18	140	± 12,5	± 16,5
	∅ 16	20	160	± 9,5	± 13,0
	∅ 18	22	180	± 7,5	± 10,0
	∅ 20	25	200	± 5,0	± 6,5
	∅ 22	26	220	± 5,0	± 7,0
	∅ 24	28	240	± 4,5	± 6,0
	∅ 25	30	250	± 3,0	± 4,5
	∅ 26	32	260	± 2,5	± 3,5
	∅ 28	35	280	± 2,0	± 2,5
	∅ 30	35	300	± 2,5	± 3,0
	∅ 32	40	320	± 1,5	± 1,5

	Fixings in hollow materials				
	M 8	12	50	± 42,5	± 56,5
	M 8	12	60	± 35,5	± 47,0
	M 8	12	80	± 26,5	± 35,5
	M 10	15	85	± 16,0	± 21,5
	M 10	15	100	± 13,5	± 18,0
	M 10	15	135	± 10,0	± 13,5
	M 10	15	140	± 9,5	± 13,0
	M 12	20	85	± 9,0	± 12,0
	M 14	20	130	± 6,0	± 8,0
	M 16	22	150	± 4,0	± 5,5
	M 16	22	200	± 3,0	± 4,0
	M 20	30	250	± 1,5	± 2,0

WARNING: The number of fixings above mentioned has been calculated according to the theoretical volume needed to fill the hole (or sleeve) excluded the volume of the inserted metal rod. In the theoretical volume it is included a standard extra quantity but the real quantity of the product may be different than it in function of the real application of the product.

Installation data

Legend			
	Material	S_{cr} [mm]	Characteristic spacing
d [mm]	Rod diameter	C_{cr} [mm]	Characteristic edge distance
	Type of rod	S_{min} [mm]	Minimum allowable spacing
h_{min} [mm]	Minimum thickness of base material	C_{min} [mm]	Minimum allowable edge distance
d_0 [mm]	Hole diameter	t_{fix} [mm]	Fixture thickness
h_1 [mm]	Hole depth	d_f [mm]	Diameter of clearence hole in the fixture
h_{nom} [mm]	Embedment depth	S_w [mm]	Key
h_{ef} [mm]	Effective anchorage depth	T_{inst} [Nm]	Installation torque



Warning: Before use see this section and the complete procedure of installation reported in the next pages. We assume no liability for the not correct use of the product.

TECHNICAL DATA SHEET

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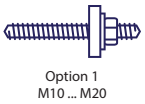
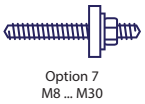

Option 1
M10 ... M20


Option 7
M8 ... M30

Material	Rod diameter	Type of rod	Min. thickness base material			Hole diameter	Hole depth			Embedment depth			Effective anchorage depth			Characteristic spacing			Characteristic edge distance		
	d [mm]		h_{min} [mm]			d_0 [mm]	h_1 [mm]			h_{nom} [mm]			h_{ef} [mm]			$S_{cr,N}$ [mm]			$C_{cr,N}$ [mm]		
			min	med	max		min	med	max	min	med	max	min	med	max	min	med	max	min	med	max
M8-M30 Non cracked concrete M10-M20 Cracked concrete	M8	≥5.8 -A4/70	100	110	190	10	65	85	165	60	80	160	60	80	160	180	230	230	90	115	115
	M10	≥5.8 -A4/70	100	120	230	12	75	95	205	70	90	200	70	90	200	210	248	248	105	124	124
	M12	≥5.8 -A4/70	110	140	270	14	85	115	245	80	110	240	80	110	240	240	297	297	120	149	149
	M16	≥5.8 -A4/70	136	161	356	18	105	130	325	100	125	320	100	125	320	300	375	396	150	188	198
	M20	≥5.8 -A4/70	168	218	448	24	125	175	405	120	170	400	120	170	400	360	450	450	180	225	225
	M24	≥5.8 -A4/70	201	266	536	28	150	215	485	145	210	480	145	210	480	435	540	540	218	270	270
	M27	≥5.8 -A4/70	205	300	600	30	150	245	545	145	240	540	145	240	540	435	624	624	218	312	312
	M30	≥5.8 -A4/70	215	340	670	35	150	275	605	145	270	600	145	270	600	435	693	693	218	346	346

Material	Rod diameter	Type of rod	Min. allowable spacing	Min. allowable edge distance	Fixture thickness	Diameter of clearence hole in the fixture	Key	Installation torque
	d [mm]		S_{min} [mm]	C_{min} [mm]	t_{fix} [mm]	d_f [mm]	S_w [mm]	T_{inst} [Nm]
					min÷max			
M8-M30 Non cracked concrete M10-M20 Cracked Concrete	M8	≥5.8 - A4 - 70	40	40	0 ÷ 1500	9	13	10
	M10	≥5.8 - A4 - 70	50	50	0 ÷ 1500	12	17	20
	M12	≥5.8 - A4 - 70	60	60	0 ÷ 1500	14	19	40
	M16	≥5.8 - A4 - 70	75	75	0 ÷ 1500	18	24	80
	M20	≥5.8 - A4 - 70	100	100	0 ÷ 1500	22	30	130
	M24	≥5.8 - A4 - 70	115	115	0 ÷ 1500	26	36	200
	M27	≥5.8 - A4 - 70	120	120	0 ÷ 1500	29	41	250
	M30	≥5.8 - A4 - 70	140	140	0 ÷ 1500	33	46	280

To avoid splitting failure, the thickness of the concrete member shall be $h \geq 2h_{ef}$

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∅ 8 ... 32 mm

Material	Rod diameter	Type of rod	Hole diameter	Anchorage length			Min. allowable spacing	Min. allowable edge distance		
	d [mm]		d_o [mm]	lv [mm]			S_{min} [mm]	C_{min} [mm]		
				MIN lb	MIN lo	MAX lb		MIN lb	MIN lo	MAX lb
C20/25 Concrete	∅ 8	Rebar (*)	10** - 12	115	200	400	40	37	42	54
	∅ 10	Rebar (*)	12** - 14	145	200	500	40	39	42	60
	∅ 12	Rebar (*)	14** - 16	170	200	600	48	40	42	66
	∅ 14	Rebar (*)	18	200	210	700	56	42	43	72
	∅ 16	Rebar (*)	20	230	240	800	64	44	45	78
	∅ 20	Rebar (*)	25	285	300	1000	80	47	48	90
	∅ 22	Rebar (*)	26	315	330	1000	88	49	50	90
	∅ 24	Rebar (*)	30	340	360	1000	96	51	52	90
	∅ 25	Rebar (*)	30	355	375	1000	100	61	63	100
	∅ 28	Rebar (*)	35	400	420	1000	112	64	65	100
	∅ 30	Rebar (*)	35	425	450	1000	120	66	67	100
	∅ 32	Rebar (*)	40	455	480	1000	128	67	69	100

(*) Rebar = FeB44k; B450C; BST 500
(**) Perforation with reduced hole is suggested for setting depth up to 250 mm

(°) Anchorage lengths according to EC2 and TR023. lb = anchorage length lo = overlap joint length

EAD 330499-01-0601
ETA - 09/0140

Option 7
∅ 8 ... 32 mm

Material	Rod diameter	Type of rod		Min. thickness base material			Hole diameter	Hole depth			Embedment depth			Effective anchorage depth			Characteristic spacing			Characteristic edge distance			Min. allowable spacing	Min. alowable edge distance
	d [mm]			h_{min} [mm]			d_o [mm]	h_1 [mm]			h_{nom} [mm]			h_{ef} [mm]			S_{cr} [mm]			C_{cr} [mm]			S_{min} [mm]	C_{min} [mm]
				min	med	max		min	med	max	min	med	max	min	med	max	min	med	max	min	med	max		
Non cracked concrete	∅ 8	Rebar (*)		100	110	190	10** - 12	65	85	165	60	80	160	60	80	160	180	240	480	90	120	240	50	50
	∅ 10	Rebar (*)		100	120	230	12** - 14	65	95	205	70	90	200	70	90	200	210	270	600	105	135	300	60	60
	∅ 12	Rebar (*)		112	142	275	14** - 16	75	115	245	80	110	240	80	110	240	240	330	720	120	165	360	65	65
	∅ 14	Rebar (*)		116	161	316	18	85	130	285	80	125	280	80	125	280	240	375	840	120	188	420	75	75
	∅ 16	Rebar (*)		140	180	360	20	85	145	325	100	140	320	100	140	320	300	420	960	150	210	480	80	80
	∅ 20	Rebar (*)		170	220	450	25	95	175	405	120	170	400	120	170	400	360	510	1200	180	255	600	100	100
	∅ 25	Rebar (*)		210	270	560	30	105	215	505	150	210	500	150	210	500	450	630	1500	225	315	750	120	120
	∅ 28	Rebar (*)		250	340	630	35	117	275	565	180	270	560	180	270	560	540	810	1860	270	405	840	140	140
	∅ 32	Rebar (*)		280	380	720	40	133	305	645	200	300	640	200	300	640	600	900	1920	300	450	960	160	160

(*) Rebar = B450C; BST 500
(**) Perforation with reduced hole is suggested for setting depth up to 250 mm
Installation parameters suitable for application according to the anchors theory

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Material	Rod diameter	Type of rod	Min. thickness base material	Hole diameter	Hole depth	Embedment depth	Effective anchorage depth	Characteristic spacing	Characteristic edge distance	Min. allowable spacing	Min. alowable edge distance	Max. fixture thickness	Diameter of clearence hole in the fixture	Key	Installation torque
	d [mm]		h_{min} [mm]	d_o [mm]	h_1 [mm]	h_{nom} [mm]	h_{ef} [mm]	S_{cr} [mm]	C_{cr} [mm]	S_{min} [mm]	C_{min} [mm]	t_{fix} [mm]	d_f [mm]	S_w [mm]	T_{inst} [Nm]
Solid brick	M 8	≥ 4.6 A2-70 A4-70	200	10	85	80	80	160	200	100	100	10	9	13	7
	M 10	≥ 4.6 A2-70 A4-70	250	12	90	85	85	200	200	100	100	20	12	17	15
	M 12	≥ 4.6 A2-70 A4-70	300	14	100	95	95	240	200	100	100	30	14	19	25
	M 16	≥ 4.6 A2-70 A4-70	350	18	130	125	125	320	200	100	100	35	18	24	30

Material	Rod diameter	Type of rod	Plastic sleeve	Min. thickness base material	Hole diameter	Hole depth	Embedment depth	Effective anchorage depth	Characteristic spacing	Characteristic edge distance	Min. allowable spacing	Min. alowable edge distance	Fixture thickness	Diameter of clearence hole in the fixture	Key	Installation torque
	d [mm]		(*)	h_{min} [mm]	d_o [mm]	h_1 [mm]	h_{nom} [mm]	h_{ef} [mm]	S_{cr} [mm]	C_{cr} [mm]	S_{min} [mm]	C_{min} [mm]	t_{fix} [mm]	d_f [mm]	S_w [mm]	T_{inst} [Nm]
Hollow brick	M 8	≥ 4.6 A2-70 A4-70	GC 12×80	100	12	85	80	80	$l_{unit,max}$	$0.5 \times l_{unit,max}$	100	100	10	9	13	3
	M 10	≥ 4.6 A2-70 A4-70	GC 15×85	100	16	90	85	85	$l_{unit,max}$	$0.5 \times l_{unit,max}$	100	100	20	12	17	4
	M 12	≥ 4.6 A2-70 A4-70	GC 20×85	100	20	90	85	85	$l_{unit,max}$	$0.5 \times l_{unit,max}$	120	120	30	14	19	6

(*) Other lenghts available
$l_{unit,max}$ = Max length of masonry unit

Material	Rod diameter	Type of rod	Min. thickness base material	Hole diameter	Hole depth	Embedment depth	Effective anchorage depth	Characteristic spacing	Characteristic edge distance	Min. allowable spacing	Min. alowable edge distance	Fixture thickness	Diameter of clearence hole in the fixture	Key	Installation torque
	d [mm]		h_{min} [mm]	d_o [mm]	h_1 [mm]	h_{nom} [mm]	h_{ef} [mm]	S_{cr} [mm]	C_{cr} [mm]	S_{min} [mm]	C_{min} [mm]	t_{fix} [mm]	d_f [mm]	S_w [mm]	T_{inst} [Nm]
Laminated timber	M 8	≥ 4.6 A2-70 A4-70	160	10	85	80	80	100	80	50	50	10	9	13	7
	M 10	≥ 4.6 A2-70 A4-70	200	12	105	100	100	125	100	50	50	20	12	17	15
	M 12	≥ 4.6 A2-70 A4-70	240	14	125	120	120	150	120	60	60	30	14	19	25
	M 16	≥ 4.6 A2-70 A4-70	320	18	165	160	160	200	160	80	80	35	18	24	30

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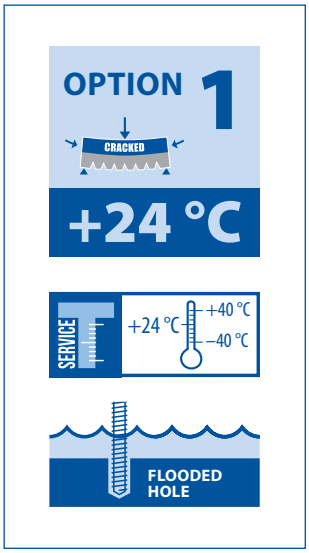
Load data

Legend	
N_{Rum} [kN]	Average ultimate tension load
V_{Rum} [kN]	Average ultimate shear load
N_{RK} [kN]	Characteristic tension load
V_{RK} [kN]	Characteristic shear load
N_{rec} [kN]	Admissible tensile load
V_{rec} [kN]	Admissible shear load



Loads for single anchor with no influence of spacing and edge distance and with h ≥ 2hef

>1kN = 100 Kg

$>\psi_{sus}$ = 1,0

Shear directed away from the edge

General safety factor included

Load increasing safety coefficient used = 1,4

With flooded hole, reduction of the recommended load of 20%

Load data with MINIMUM effective anchorage depth

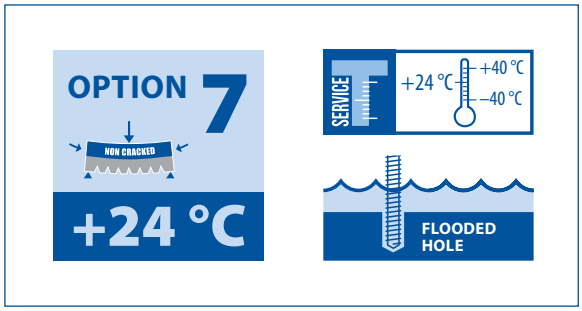
Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	≥ 5.8	M 10	70	27,8	18,1	19,1	15,1	9,1	8,6
	≥ 5.8	M 12	80	33,9	26,3	25,8	21,9	12,2	12,5
	≥ 5.8	M 16	100	47,5	48,9	36,0	40,8	17,1	23,3
	≥ 5.8	M 20	120	62,4	76,2	47,3	63,5	22,5	34,3

Load data with MEDIUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	≥ 5.8	M 10	90	30,2	18,1	24,6	15,1	11,7	8,6
	≥ 5.8	M 12	110	43,8	26,3	37,5	21,9	17,8	12,5
	≥ 5.8	M 16	125	66,3	48,9	50,3	40,8	23,9	23,3
	≥ 5.8	M 20	170	104,4	76,2	71,0	63,5	33,8	36,2

Load data with MAXIMUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	8.8	M 10	200	46,4	27,8	46,4	23,2	22,1	13,2
	8.8	M 12	240	67,4	40,4	67,4	33,7	32,1	19,2
	8.8	M 16	320	125,0	75,0	125,0	62,5	59,5	35,7
	8.8	M 20	400	203,0	121,8	167,0	101,5	79,5	58,0



Load data with MINIMUM effective anchorage depth

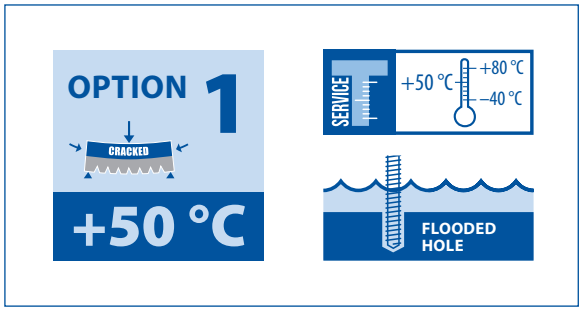
Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked Concrete	≥ 5.8	M 8	60	19,0	11,4	19,0	9,5	9,0	5,4
	≥ 5.8	M 10	70	30,2	18,1	25,2	15,1	12,0	8,6
	≥ 5.8	M 12	80	43,8	26,3	35,7	21,9	17,0	12,5
	≥ 5.8	M 16	100	67,5	48,9	50,5	40,8	24,0	23,3
	≥ 5.8	M 20	120	88,7	76,2	66,3	63,5	31,6	36,3
	≥ 5.8	M 24	145	117,8	110,4	88,1	92,0	41,9	52,5
	≥ 5.8	M 27	145	117,8	143,4	88,1	119,5	42,0	68,2
	≥ 5.8	M 30	145	117,8	175,2	88,1	146,0	42,0	83,4

Load data with MEDIUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked Concrete	≥ 5.8	M 8	80	19,0	11,4	19,0	9,5	9,0	5,4
	≥ 5.8	M 10	90	30,2	18,1	30,2	15,1	14,3	8,6
	≥ 5.8	M 12	110	43,8	26,3	43,8	21,9	20,8	12,5
	≥ 5.8	M 16	125	81,6	48,9	70,5	40,8	33,6	23,3
	≥ 5.8	M 20	170	127,0	76,2	104,7	63,5	49,8	36,3
	≥ 5.8	M 24	210	184,0	110,4	153,2	92,0	72,9	52,5
	≥ 5.8	M 27	240	221,3	143,4	168,6	119,5	80,3	68,2
	≥ 5.8	M 30	270	271,8	175,2	208,4	146,0	99,2	83,4

Load data with MAXIMUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	8.8	M 8	160	29,2	17,5	29,2	14,6	13,9	8,3
	8.8	M 10	200	46,4	27,8	46,4	23,2	22,1	13,2
	8.8	M 12	240	67,4	40,4	67,4	33,7	32,1	19,2
	8.8	M 16	320	125,0	75,0	125,0	62,5	59,5	35,7
	8.8	M 20	400	203,0	121,8	203,0	101,5	96,6	58,0
	8.8	M 24	480	293,0	175,8	293,0	146,5	139,5	83,7
	8.8	M 27	540	381,0	228,6	379,2	190,5	180,6	108,8
	8.8	M 30	600	466,0	279,6	463,1	233,0	220,5	133,1



Load data with MINIMUM effective anchorage depth

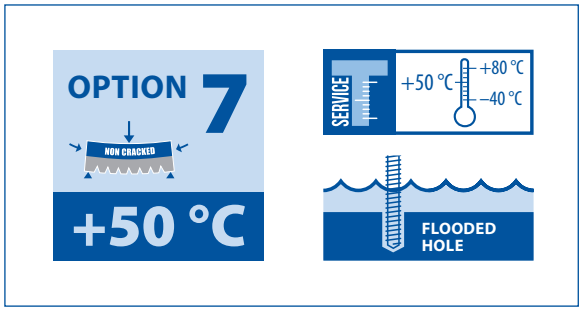
Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate Shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	≥ 5.8	M 10	70	27,8	18,1	13,8	15,1	6,5	8,6
	≥ 5.8	M 12	80	33,9	26,3	19,6	21,9	9,3	12,5
	≥ 5.8	M 16	100	47,5	48,9	29,5	40,8	14,0	23,3
	≥ 5.8	M 20	120	62,4	76,2	36,0	63,5	17,1	34,3

Load data with MEDIUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate Shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	≥ 5.8	M 10	90	30,2	18,1	17,7	15,1	8,4	8,6
	≥ 5.8	M 12	110	43,8	26,3	27,0	21,9	12,8	12,5
	≥ 5.8	M 16	125	66,3	48,9	36,9	40,8	17,6	23,3
	≥ 5.8	M 20	170	104,4	76,2	51,1	63,5	24,3	36,2

Load data with MAXIMUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate Shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	8.8	M 10	200	46,4	27,8	39,4	23,2	18,7	13,2
	8.8	M 12	240	67,4	40,4	58,9	33,7	28,0	19,2
	8.8	M 16	320	125,0	75,0	94,6	62,5	45,0	35,7
	8.8	M 20	400	203,0	121,8	120,2	101,5	57,2	58,0



Load data with MINIMUM effective anchorage depth

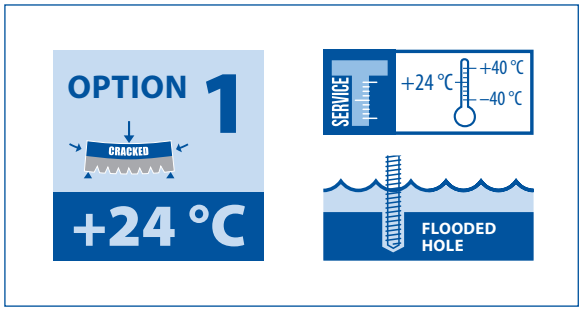
Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	≥ 5.8	M 8	60	19,0	11,4	17,2	9,5	8,2	5,4
	≥ 5.8	M 10	70	30,2	18,1	18,1	15,1	8,6	8,6
	≥ 5.8	M 12	80	43,8	26,3	25,7	21,9	12,2	12,5
	≥ 5.8	M 16	100	67,5	48,9	42,6	40,8	20,3	23,3
	≥ 5.8	M 20	120	88,7	76,2	53,2	63,5	25,3	36,3
	≥ 5.8	M 24	145	117,8	110,4	76,1	92,0	36,2	52,5
	≥ 5.8	M 27	145	117,8	143,4	78,9	119,5	37,6	68,2
	≥ 5.8	M 30	145	117,8	175,2	86,2	146,0	41,0	83,4

Load data with MEDIUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	≥ 5.8	M 8	80	19,0	11,4	19,0	9,5	9,0	5,4
	≥ 5.8	M 10	90	30,2	18,1	23,3	15,1	11,1	8,6
	≥ 5.8	M 12	110	43,8	26,3	35,4	21,9	16,8	12,5
	≥ 5.8	M 16	125	81,6	48,9	53,3	40,8	25,3	23,3
	≥ 5.8	M 20	170	127,0	76,2	75,3	63,5	35,9	36,3
	≥ 5.8	M 24	210	184,0	110,4	110,3	92,0	52,5	52,5
	≥ 5.8	M 27	240	221,3	143,4	130,6	119,5	62,3	68,2
	≥ 5.8	M 30	270	271,8	195,2	160,5	146,0	76,3	83,4

Load data with MAXIMUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	8.8	M 8	160	29,2	17,5	29,2	14,6	13,9	8,3
	8.8	M 10	200	46,4	27,8	46,4	23,2	22,1	13,2
	8.8	M 12	240	67,4	40,4	67,4	33,7	32,1	19,2
	8.8	M 16	320	125,0	75,0	125,0	62,5	59,5	35,7
	8.8	M 20	400	203,0	121,8	177,3	101,5	84,4	58,0
	8.8	M 24	480	293,0	175,8	252,1	146,5	120,0	83,7
	8.8	M 27	540	381,3	228,6	293,8	190,5	139,9	108,8
	8.8	M 30	600	466,0	279,6	356,6	233,0	169,8	133,1



Load data with MINIMUM effective anchorage depth

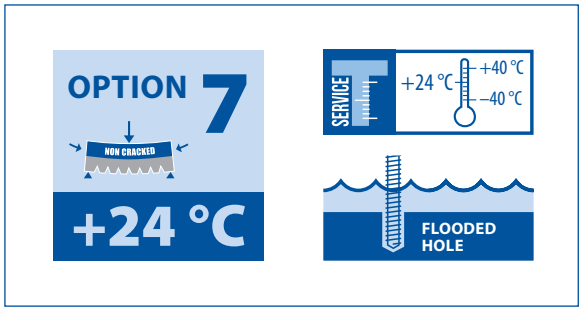
Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	A4-70	M 10	70	27,8	24,3	19,1	20,3	9,1	9,2
	A4-70	M 12	80	33,9	35,4	25,7	29,5	12,2	13,5
	A4-70	M 16	100	47,5	65,9	36,0	54,9	17,1	25,1
	A4-70	M 20	120	62,4	102,9	47,3	72,1	22,5	34,3

Load data with MEDIUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	A4-70	M 10	90	40,5	24,3	24,6	20,3	11,7	9,2
	A4-70	M 12	110	54,8	35,4	37,5	29,5	17,8	13,5
	A4-70	M 16	125	66,3	65,9	50,3	54,9	23,9	25,1
	A4-70	M 20	170	104,4	102,9	71,0	85,7	33,8	39,2

Load data with MAXIMUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	A4-70	M 10	200	40,6	24,3	40,6	20,3	15,5	9,2
	A4-70	M 12	240	59,0	35,4	59,0	29,5	22,5	13,5
	A4-70	M 16	320	109,9	65,9	109,9	54,9	41,9	25,1
	A4-70	M 20	400	171,5	102,9	167,0	85,7	65,5	39,2



Load data with MINIMUM effective anchorage depth

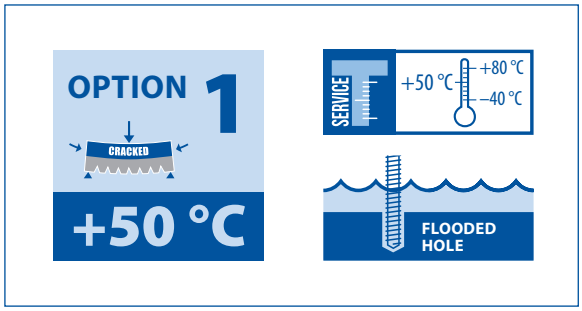
Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	A4-70	M 8	60	25,6	15,3	23,4	12,8	9,7	5,8
	A4-70	M 10	70	37,5	24,3	25,2	20,3	12,0	9,2
	A4-70	M 12	80	45,3	35,4	35,7	29,5	17,0	13,5
	A4-70	M 16	100	67,5	65,9	50,5	54,9	24,0	25,1
	A4-70	M 20	120	88,7	102,9	66,3	85,7	31,6	39,2
	A4-70	M 24	145	117,8	148,2	88,1	123,5	41,9	56,5
	A4-70	M 27	145	117,8	160,6	88,1	160,6	41,9	73,5
	A4-70	M 30	145	117,8	196,4	88,1	176,2	41,9	83,9

Load data with MEDIUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	A4-70	M 8	80	25,6	15,3	25,6	12,8	9,7	5,8
	A4-70	M 10	90	40,6	24,3	32,4	20,3	15,4	9,2
	A4-70	M 12	110	59,0	35,4	49,1	29,5	22,5	13,5
	A4-70	M 16	125	87,5	65,9	70,5	54,9	33,6	25,1
	A4-70	M 20	170	130,6	102,9	104,6	85,7	49,8	39,2
	A4-70	M 24	210	196,1	148,2	153,1	123,5	72,9	56,5
	A4-70	M 27	240	221,3	160,6	166,9	160,6	79,5	73,5
	A4-70	M 30	270	271,7	196,3	205,0	196,3	97,6	89,9

Load data with MAXIMUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	A4-70	M 8	160	25,6	15,3	25,6	12,8	9,7	5,8
	A4-70	M 10	200	40,6	24,3	40,6	20,3	15,5	9,2
	A4-70	M 12	240	59,0	35,4	59,0	29,5	22,5	13,5
	A4-70	M 16	320	109,9	65,9	109,9	54,9	41,9	25,1
	A4-70	M 20	400	171,5	102,9	171,5	85,7	65,5	39,2
	A4-70	M 24	480	247,1	148,2	247,1	123,5	94,3	56,5
	A4-70	M 27	540	321,3	160,6	321,3	160,6	122,7	73,5
	A4-70	M 30	600	392,7	235,6	392,7	196,3	150,0	89,9



Load data with MINIMUM effective anchorage depth

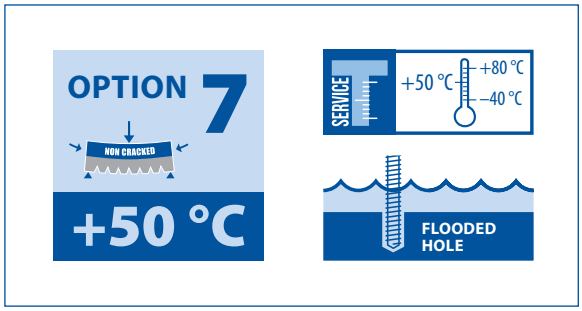
Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	A4-70	M 10	70	27,8	24,3	13,8	20,3	6,5	9,2
	A4-70	M 12	80	33,9	35,4	19,6	29,5	9,3	13,5
	A4-70	M 16	100	47,5	65,9	29,5	54,9	14,0	25,1
	A4-70	M 20	120	62,4	102,9	36,0	72,1	17,1	34,3

Load data with MEDIUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	A4-70	M 10	90	40,5	24,3	17,7	20,3	8,4	9,2
	A4-70	M 12	110	54,8	35,4	27,0	29,5	12,8	13,5
	A4-70	M 16	125	66,3	65,9	36,9	54,9	17,6	25,1
	A4-70	M 20	170	104,4	102,9	51,1	85,7	24,3	39,2

Load data with MAXIMUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Cracked concrete	A4-70	M 10	200	40,6	24,3	39,4	20,3	15,5	9,2
	A4-70	M 12	240	59,0	35,4	58,9	29,5	22,5	13,5
	A4-70	M 16	320	109,9	65,9	94,6	54,9	41,9	25,1
	A4-70	M 20	400	171,5	102,9	120,2	85,7	57,2	39,2



Load data with MINIMUM effective anchorage depth

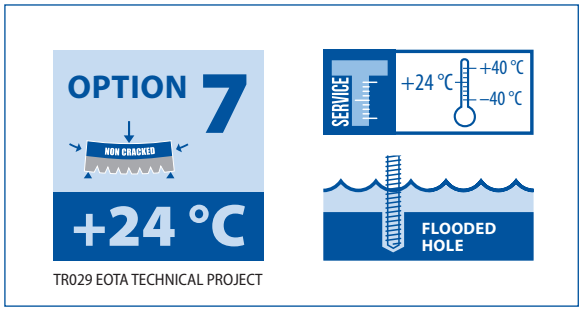
Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	A4-70	M 8	60	25,6	15,3	17,2	12,8	8,2	5,8
	A4-70	M 10	70	37,5	24,3	18,1	20,3	8,6	9,2
	A4-70	M 12	80	45,3	35,4	25,7	29,5	12,2	13,5
	A4-70	M 16	100	67,5	65,9	42,6	54,9	20,3	25,1
	A4-70	M 20	120	88,7	102,9	53,2	85,7	25,3	39,2
	A4-70	M 24	145	117,8	148,2	76,1	123,5	36,2	56,5
	A4-70	M 27	145	117,8	160,6	73,3	146,6	34,9	69,8
	A4-70	M 30	145	117,8	196,4	80,6	161,1	38,4	76,7

Load data with MEDIUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	A4-70	M 8	80	25,6	15,3	23,0	12,8	9,7	5,8
	A4-70	M 10	90	40,6	24,3	23,3	20,3	11,1	9,2
	A4-70	M 12	110	59,0	35,4	35,4	29,5	16,8	13,5
	A4-70	M 16	125	87,5	65,9	53,3	54,9	25,3	25,1
	A4-70	M 20	170	130,6	102,9	75,3	85,7	35,8	39,2
	A4-70	M 24	210	196,1	148,2	110,3	123,5	52,5	56,5
	A4-70	M 27	240	221,3	160,6	121,3	160,6	57,7	73,5
	A4-70	M 30	270	271,7	196,3	150,0	196,3	71,5	89,9

Load data with MAXIMUM effective anchorage depth

Material	Rod	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
		d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete	A4-70	M 8	160	25,6	15,3	25,6	12,8	9,7	5,8
	A4-70	M 10	200	40,6	24,3	40,6	20,3	15,5	9,2
	A4-70	M 12	240	59,0	35,4	59,0	29,5	22,5	13,5
	A4-70	M 16	320	109,9	65,9	109,9	54,9	41,9	25,1
	A4-70	M 20	400	171,5	102,9	171,5	85,7	65,5	39,2
	A4-70	M 24	480	247,1	148,2	247,1	123,5	94,3	56,5
	A4-70	M 27	540	321,3	160,6	272,9	160,6	122,7	73,5
	A4-70	M 30	600	392,7	235,6	333,4	196,3	150,0	89,9



TR029 EOTA TECHNICAL PROJECT

Load data with MINIMUM effective anchorage depth

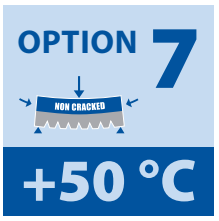
Material	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
	d [mm]	$h_{ef\,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete Rebar B450C BST500	∅ 8	60	24,7	16,2	21,1	13,6	10,1	7,8
	∅ 10	70	33,1	25,4	28,3	21,2	13,5	12,1
	∅ 12	80	41,0	36,6	36,1	30,5	17,2	17,4
	∅ 14	80	46,2	49,8	36,1	41,6	17,2	23,8
	∅ 16	100	64,1	65,1	50,5	54,3	24,0	31,0
	∅ 20	120	88,7	101,0	66,4	84,8	31,6	48,5
	∅ 25	150	124,0	159,0	92,8	132,5	44,2	75,7
	∅ 28	180	163,0	199,5	122,0	166,3	58,1	95,0
	∅ 32	200	185,4	260,5	142,8	217,1	68,0	124,1

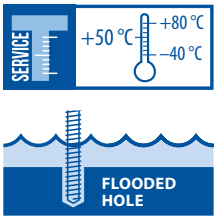
Load data with MEDIUM effective anchorage depth

Material	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
	d [mm]	$h_{ef\,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete Rebar B450C BST500	∅ 8	80	27,1	16,2	27,1	13,6	12,9	7,8
	∅ 10	90	42,4	25,4	36,3	21,2	17,3	12,1
	∅ 12	110	56,4	36,6	52,1	30,5	24,8	17,4
	∅ 14	125	72,1	49,8	66,6	41,6	31,7	23,8
	∅ 16	140	89,8	65,1	73,8	54,3	35,1	31,0
	∅ 20	170	126,7	101,0	104,1	84,8	49,6	48,5
	∅ 25	210	197,3	159,0	153,7	132,5	73,2	75,7
	∅ 28	270	250,3	199,5	205,7	166,3	97,9	95,0
	∅ 32	300	278,1	260,5	228,5	217,1	108,8	124,1

Load data with MAXIMUM effective anchorage depth

Material	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
	d [mm]	$h_{ef\,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete Rebar B450C BST500	∅ 8	160	27,1	16,2	27,1	13,6	12,9	7,8
	∅ 10	200	42,4	25,4	42,4	21,2	20,2	12,1
	∅ 12	240	61,1	36,6	61,1	30,5	29,1	17,4
	∅ 14	280	83,1	49,8	83,1	41,6	39,6	23,8
	∅ 16	320	108,6	65,1	108,6	54,3	51,7	31,0
	∅ 20	400	169,6	101,0	169,6	84,8	80,8	48,5
	∅ 25	500	265,1	159,0	265,1	132,5	126,2	75,7
	∅ 28	560	332,5	199,5	332,5	166,3	158,3	95,0
	∅ 32	640	434,3	260,5	434,3	217,1	206,8	124,1





TR029 EOTA TECHNICAL PROJECT

Load data with MINIMUM effective anchorage depth

Material	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
	d [mm]	$h_{ef,MIN}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete Rebar B450C BST500	∅ 8	60	24,7	16,2	21,1	13,6	7,2	7,8
	∅ 10	70	33,1	25,4	28,3	21,2	9,7	12,1
	∅ 12	80	41,0	36,6	36,1	30,5	13,0	17,4
	∅ 14	80	46,2	49,8	36,1	41,6	14,6	23,8
	∅ 16	100	64,1	65,1	50,5	54,3	18,1	31,0
	∅ 20	120	88,7	101,0	66,4	84,8	25,2	48,5
	∅ 25	150	124,0	159,0	92,8	132,5	41,3	75,7
	∅ 28	180	163,0	199,5	122,0	166,3	47,2	95,0
	∅ 32	200	185,4	260,5	142,8	217,1	52,2	124,1

Load data with MEDIUM effective anchorage depth

Material	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
	d [mm]	$h_{ef,MED}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete Rebar B450C BST500	∅ 8	80	27,1	16,2	27,1	13,6	9,7	7,8
	∅ 10	90	42,4	25,4	36,3	21,2	12,5	12,1
	∅ 12	110	56,4	36,6	52,1	30,5	17,9	17,4
	∅ 14	125	72,1	49,8	66,6	41,6	20,3	23,8
	∅ 16	140	89,8	65,1	73,8	54,3	25,3	31,0
	∅ 20	170	126,7	101,0	104,1	84,8	35,7	48,5
	∅ 25	210	197,3	159,0	153,7	132,5	57,8	75,7
	∅ 28	270	250,3	199,5	205,7	166,3	70,9	95,0
	∅ 32	300	278,1	260,5	228,5	217,1	78,3	124,1

Load data with MAXIMUM effective anchorage depth

Material	Rod diameter	Effective anchorage depth	Ultimate tension load	Ultimate shear load	Characteristic tensile load	Characteristic shear load	Admissible tensile load	Admissible shear load
	d [mm]	$h_{ef,MAX}$ [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{Rk} [kN]	V_{Rk} [kN]	N_{rec} [kN]	V_{rec} [kN]
C20/25 Non cracked concrete Rebar B450C BST500	∅ 8	160	27,1	16,2	27,1	13,6	12,9	7,8
	∅ 10	200	42,4	25,4	42,4	21,2	20,2	12,1
	∅ 12	240	61,1	36,6	61,1	30,5	29,1	17,4
	∅ 14	280	83,1	49,8	83,1	41,6	39,6	23,8
	∅ 16	320	108,6	65,1	108,6	54,3	51,7	31,0
	∅ 20	400	169,6	101,0	169,6	84,8	80,8	48,5
	∅ 25	500	265,1	159,0	265,1	132,5	126,2	75,7
	∅ 28	560	332,5	199,5	332,5	166,3	158,3	95,0
	∅ 32	640	434,3	260,5	434,3	217,1	206,8	124,1

Post-installed rebar connections

Hammer drilled holes

EAD 330087-00-0601
ETA - 09/0246

REBAR EC2 +50 °C

SERVICE +50 °C +80 °C –40 °C

Material	Type of rod	Rod diameter	Bond resistance fbd [N/mm²]								
		d [mm]	C 12/15	C 16/20	C 20/25	C 25/30	C 30/37	C 35/45	C 40/50	C 45/55	C 50/60
Wet and dry concrete (*) Rebar = B450C BST 500	Rebar (*)	∅ 8	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
	Rebar (*)	∅ 10	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
	Rebar (*)	∅ 12	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
	Rebar (*)	∅ 14	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
	Rebar (*)	∅ 16	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,0
	Rebar (*)	∅ 20	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,0
	Rebar (*)	∅ 22	1,6	2,0	2,3	2,7	3,0	3,4	3,7	3,7	4,0
	Rebar (*)	∅ 24	1,6	2,0	2,3	2,7	3,0	3,4	3,7	3,7	3,7
	Rebar (*)	∅ 25	1,6	2,0	2,3	2,7	3,0	3,4	3,7	3,7	3,7
	Rebar (*)	∅ 28	1,6	2,0	2,3	2,7	3,0	3,4	3,4	3,4	3,4
	Rebar (*)	∅ 30	1,6	2,0	2,3	2,7	2,7	2,7	2,7	2,7	2,7
	Rebar (*)	∅ 32	1,6	2,0	2,3	2,7	2,7	2,7	2,7	2,7	2,7

Design value of bond strength fbd suitable for all anchorage lengths

Hammer drilled holes

FIXING IN SEISMIC
POST INSTALLED REBAR
EAD 331522-00-0601

REBAR EC8 +50 °C

SERVICE +50 °C +80 °C –40 °C

Material	Type of rod	Rod diameter							
		d [mm]	C 16/20	C 20/25	C 25/30	C 30/37	C 35/45	C 40/50	C 45/55	C 50/60
Wet and dry concrete (*) Rebar = B450C BST 500	Rebar (*)	∅ 12	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	∅ 14	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	∅ 16	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	∅ 20	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	∅ 22	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	∅ 24	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	∅ 25	2,0	2,3	2,3	2,3	2,3	2,3	2,3	2,3
	Rebar (*)	∅ 28	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0
	Rebar (*)	∅ 30	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0
	Rebar (*)	∅ 32	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0

Design value of bond strength fbd suitable for all anchorage lengths

Load data solid, hollow masonry and timber

Material	Type of rod	Rod diameter	Ultimate tension Load	Ultimate shear load	Admissible tensile load	Admissible shear load
		d [mm]	N_{Rum} [kN]	V_{Rum} [kN]	N_{rec} [kN]	V_{rec} [kN]
Solid Brick ≥ 4.6 / A2-70 / A4-70	≥ 4.6 A2-70 A4-70	M8	Recommended loads for applications on base materials with medium strength characteristics. For different masonry and/or wood base materials, load values must be obtained with in site tests.		2,0	3,0
	≥ 4.6 A2-70 A4-70	M10			2,6	3,4
	≥ 4.6 A2-70 A4-70	M12			2,8	3,9
	≥ 4.6 A2-70 A4-70	M16			4,0	4,2
Hollow Material ≥ 4.6 / A2-70 / A4-70	≥ 4.6 A2-70 A4-70	M8			0,9	2,0
	≥ 4.6 A2-70 A4-70	M10			0,9	2,0
	≥ 4.6 A2-70 A4-70	M12			0,9	2,5
Laminated Timber ≥ 4.6 / A2-70 / A4-70	≥ 4.6 A2-70 A4-70	M8			3,2	For shear loads refer to CNR-DT 206/2007 (7.10.2.3)
	≥ 4.6 A2-70 A4-70	M10			4,2	
	≥ 4.6 A2-70 A4-70	M12			6,1	
	≥ 4.6 A2-70 A4-70	M16			10,7	

Installation procedure

Cleaning

Drill the hole and check it's perpendicularity. Blow the hole with an appropriate pump blower (or compression air), clean the lateral surface of the hole with an appropriate steel brush, blow again in the hole until there is no dust and/or any residual material inside. We strongly recommend use of the steel brush to clean hole sides. It is recommended that you drill and prepare all holes for anchoring before using the anchoring compound due to the fast setting times of the anchoring compound.

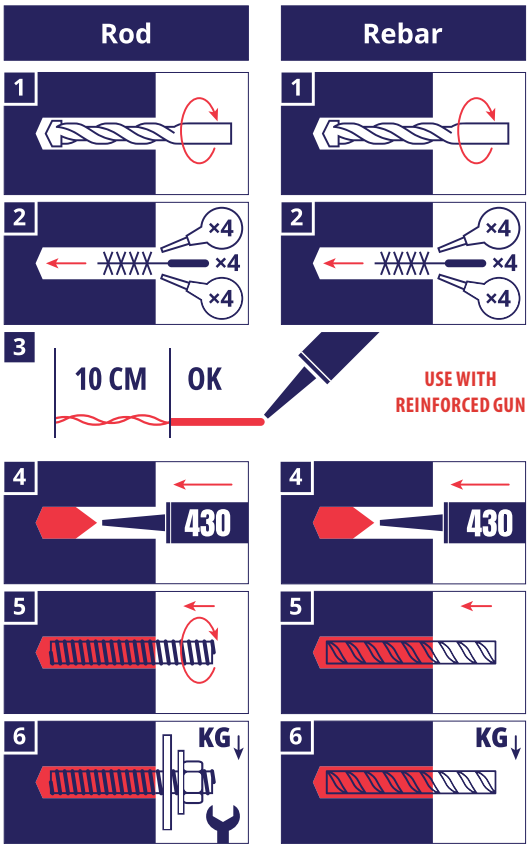
Opening

Unscrew the front cup, pull-out the steel closing clip according to the following operations: 1) Insert the mixer in the eye of the plastic extractor. 2) Pull the extractor to unhook the steel closing clip of the foil. After that, screw on the mixer and insert the cartridge in the gun. Use protections for hands and face.

Cartridge preparation

Use the correct dispenser

Before starting to use the cartridge, eject a first part of the product, being sure that: 1) Trough the mixer (transparent) see that the flux of product is compound of the part A (white colour) end of part B (black colour). 2) The two components are completely mixed. The



complete mixing is reached only after that the product, obtained by mixing the two component, comes out from the mixer with an uniform colour. Now the cartridge is ready to be used.

Injection

1) Inject resin into the hole up to fill it 2/3rds. In hollow bricks use the plastic sleeve and inject the resin inside. 2) Before insert the rod, verify that the element is dry and free oil and other contaminants. Insert threaded stud turning back and forth to avoid presence of air in the fitted hole. 3) For the installation and the following anchor load phase, respect the open time and curing time detailed in the technical data sheet and in the label of the product. 4) Before to load the anchor, check the hardened of the product. 5) The cartridge can be used again screwing the cup and replacing the mixer. Remember to eject a first part of the product, see point 3.

WARNING. Installation and loads technical data can be modified by us. For update technical data sheet see www.tegrastate.lt.

Package

300 ml plastic cartridge, 15 cartridges in a box.

Storage and conservation

Guaranteed shelf life – 15 months from the date of manufacture, if stored in closed original packaging in a dry and cool place from +5 °C to +30 °C.