

TECHNICAL DATASHEET

Gebofix PRO VE-SF CE1 styrene-free vinylster chemical anchor

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Certificates

ETA 16/0600 Certification Option 1 for anchoring on non-cracked and cracked concrete with threaded bars; performance category C1 for seismic actions with threaded bars M12 to M24. Certification on non-cracked concrete with reinforcing bars

ETA 16/0599 Certification for reinforcing bars, design according to Eurocode 2 (EN 1992-1-1)

ETA 16/0919 Certification for anchoring on masonry, with threaded bar and plastic sleeve

Certification of fire resistance

Complies with LEED® requirements, IEQ Credit 4.1

Class A+ for emission of volatile organic compounds (VOCs) in living spaces

Suitable for contact with drinking water

Base material

certified use	specific use	suitable use
non-cracked concrete cracked concrete perforated and hollow masonry	natural stone solid, perforated and hollow masonry hollow concrete block wood	cellular concrete

Sizes

art.	content	mixer	gun
CC13	410 ml	2 M17	CP01, CP11, CP15, CP16
CC14	350 ml	2 M17	PK5
CC32	300 ml	1 M17	CP07, CP17

Intended use

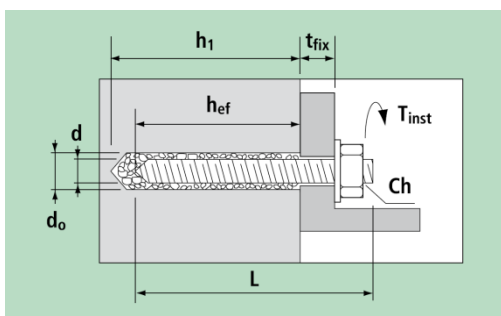
Dry or wet concrete
Flooded holes on concrete (bars M8 to M16 and Ø8 to Ø16)
Dry masonry, installation in dry or wet substrate
Cartridge temperature: between +5 and +20 °C
Installation temperature: between +5 and +30 °C
Work temperature: I between -40 and +40 °C (maximum short term temperature +40 °C; long term +24 °C)
II between -40 and +80 °C (maximum short term temperature +80 °C; long term +50 °C)
Shelf life: 18 months for 410 ml and 350 ml cartridges, 12 months for 300 ml cartridges (storage temperature between +5 and +25 °C)

Time and temperatures

temperature of base material	working time	full curing dry base material	full curing wet base material
-10 ÷ +4 °C *	20 min *	24 h *	48 h *
+5 ÷ +9 °C	10 min	145 min	290 min
+10 ÷ +19 °C	6 min	85 min	170 min
+20 ÷ +29 °C	4 min	50 min	100 min
+30 °C	4 min	40 min	80 min

* usage not covered by certification

cartridge temperature must be between +5 and +20 °C



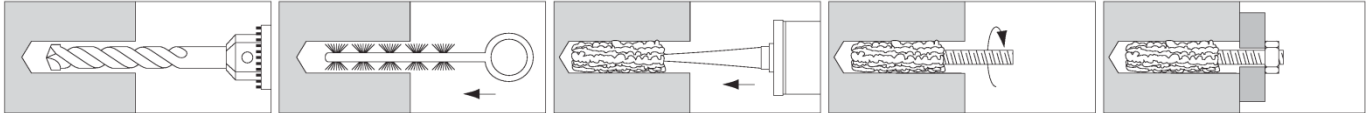
- d = bar diameter
- L = bar length
- t_{fix} = fixable thickness
- d₀ = hole diameter
- h₁ = minimum hole depth
- h_{nom} = setting depth
- h_{ef} = effective anchorage depth
- T_{inst} = tightening torque

use without sleeve: h_{ef} = h₁ = h_{nom}

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- **Use on non-cracked and cracked concrete with threaded bars**

Installation

Setting parameters

bar size		M8	M10	M12	M16	M20	M24	M27	M30
hole diameter	d ₀ mm	10	12	14	18	22	26	30	35
hole depth	h _{ef,min} mm	64	80	96	128	160	192	216	240
	h _{ef,max} mm	160	200	240	320	400	480	540	600
minimum spacing	s _{min} mm	h _{ef} / 2							
minimum edge distance	c _{min} mm	h _{ef} / 2							
min. base material thickness	h _{min} mm	h _{ef} + 30 ≥ 100				h _{ef} + 2d ₀			
tightening torque	T _{inst} Nm	10	20	40	80	150	200	240	275

Strength data

For installation on dry or wet concrete and work temperature I (minimum temperature -40 °C, maximum short term temperature +40 °C; long term +24 °C)

Valid for a single anchor far from the edges, on a thick concrete member of class C20/25 with sparse reinforcing.

- **Threaded bars on non-cracked concrete**

Characteristic resistance of resin (kN)

at standard embedment depth

bar size		M8	M10	M12	M16	M20	M24	M27	M30
embedment depth	h _{ef} (mm)	80	90	110	128	170	210	240	270
tension	N _{Rk,p} (kN)	17.1	28.3	39.4	57.9	90.8	126.7	132.3	140.0

Design resistance (kN)

at standard embedment depth, for threaded bars in steel class 5.8 and 8.8

bar size		M8	M10	M12	M16	M20	M24	M27	M30
embedment depth	h _{ef} (mm)	80	90	110	128	170	210	240	270
tension	N _{Rd} (kN)	9.5	15.7	21.9	32.2	50.4	70.4	63.0	66.6
shear	V _{Rd} (kN)	7.3	11.6	16.9	31.4	49.0	70.6	91.8	112.2
		11.7	18.6	27.0	50.2	78.4	113.0	146.9	179.5

Recommended load (kN)

at standard embedment depth, for threaded bars in steel class 5.8 and 8.8

bar size		M8	M10	M12	M16	M20	M24	M27	M30
embedment depth	h _{ef} (mm)	80	90	110	128	170	210	240	270
tension	N _{rec} (kN)	6,8	11,2	15,6	23,0	36,0	50,3	45,0	47,6
shear	V _{rec} (kN)	5,2	8,3	12,0	22,4	35,0	50,4	65,6	80,1
		8,4	13,3	19,3	35,9	56,0	80,7	104,9	128,2

1 kN ≈ 100 kg

steel failure class 5.8 – steel failure class 8.8

- **Threaded bars on cracked concrete**

Characteristic resistance of resin (kN)

at standard embedment depth

bar size		M12	M16	M20	M24
embedment depth	h _{ef} (mm)	110	128	170	210
tension	N _{Rk,p} (kN)	18.7	29.0	48.1	71.3

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Design resistance (kN)

 at standard embedment depth, for threaded bars in steel class **5.8** and **8.8**

bar size		M12	M16	M20	M24
embedment depth	h_{ef} (mm)	110	128	170	210
tension	N_{Rd} (kN)	10.4	16.1	26.7	39.6
shear	V_{Rd} (kN)	16.8	31.2	48.8	70.4
		24.9	38.6	64.1	95.0

Recommended load (kN)

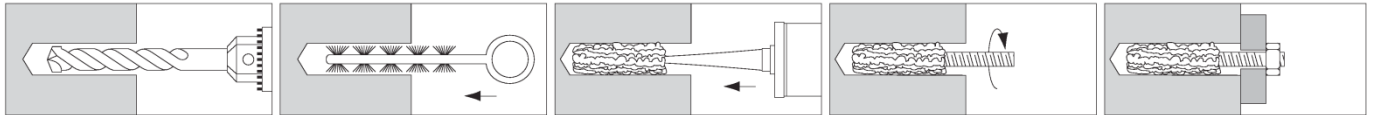
 at standard embedment depth, for threaded bars in steel class **5.8** and **8.8**

bar size		M12	M16	M20	M24
embedment depth	h_{ef} (mm)	110	128	170	210
tension	N_{rec} (kN)	7.4	11.5	19.1	28.3
shear	V_{rec} (kN)	12.0	22.3	34.9	50.3
		17.8	27.6	45.8	67.9

 1 kN \approx 100 kg

 steel failure class **5.8** – steel failure class **8.8**

- **Use on non-cracked concrete with reinforcing bars (used as anchors)**

Installation

Setting parameters

bar size		Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32	
hole diameter	d_0 mm	12	14	16	20	25	32	40	
hole depth	$h_{ef,min}$ mm	64	80	96	128	160	200	256	
	$h_{ef,max}$ mm	160	200	240	320	400	500	640	
minimum spacing	s_{min} mm	$h_{ef} / 2$							
minimum edge distance	c_{min} mm	$h_{ef} / 2$							
min. base material thickness	h_{min} mm	$h_{ef} + 30 \geq 100$				$h_{ef} + 2d_0$			

Strength data

 For installation on dry or wet concrete and work temperature I (minimum temperature -40 °C, maximum short term temperature $+40$ °C; long term $+24$ °C)

Valid for a single anchor far from the edges, on a thick concrete member of class C20/25 with sparse reinforcing.

- **Reinforcing bars on non-cracked concrete**

Characteristic resistance of resin (kN)

at standard embedment depth

bar size		Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
embedment depth	h_{ef} (mm)	80	90	110	145	170	210	300
tension	$N_{Rk,p}$ (kN)	17.1	28.3	41.5	65.6	96.1	148.4	165.9

Design resistance (kN)

 at standard embedment depth, for reinforcing bars with $f_{uk} = 550$ N/mm²

bar size		Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
embedment depth	h_{ef} (mm)	80	90	110	145	170	210	300
tension	N_{Rd} (kN)	9.5	15.7	23.0	36.4	53.4	82.5	92.2
shear	V_{Rd} (kN)	9.2	14.4	20.7	36.9	57.6	90.0	147.4

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Recommended load (kN)

 at standard embedment depth, for reinforcing bars with $f_{uk} = 550 \text{ N/mm}^2$

bar size		Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
embedment depth	h_{ef} (mm)	80	90	110	145	170	210	300
tension	N_{rec} (kN)	6.8	11.2	16.5	26.0	38.1	58.9	65.8
shear	V_{rec} (kN)	6.6	10.3	14.8	26.3	41.1	64.3	105.3

 1 kN \approx 100 kg

steel failure

Load values derive from parameters certified in European Technical Assessment ETA 16/0600. Characteristic resistance N_{Rk} refers uniquely to the resin resistance to failure due to pull-out and concrete cone. Design resistances N_{Rd} and V_{Rd} refer to all failure modes and include partial safety factors on strengths. Recommended loads N_{rec} and V_{rec} include the further 1.4 safety factor.

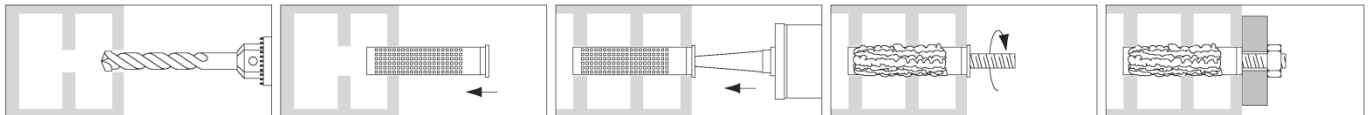
For the design of fixing with reduced spacing, near the edge or on concrete with increased resistance, reduced thickness or dense reinforcement refer to ETA 16/0600 or to Declaration of Performance DPGEB1008 and use the design method outlined in EOTA's *Technical Report 029* or in CEN/TS 1992-4-5:2009. In the same way, for anchors installed in flooded holes and for different working temperatures (II, between -40 and +80 °C) refer to ETA. One can also calculate and verify the fixings made with Gebofix PRO VE-SF by means of *G&B Calculation Program* available on the website www.gebfissaggi.com.

Seismic actions

The anchor can be used under seismic actions for performance category C1 with threaded bars M12, M16, M20, M24.

For the design of strength of anchors under seismic actions refer to ETA 16/0600 or to Declaration of Performance DPGEB1008 and use the design method outlined in EOTA's *Technical Report 045*.

- Use on masonry**

Installation

Base material

		classification	L/W/H (mm)	min. density ρ (kg/dm ³)	min. compr. strength f_b (N/mm ²)
solid brick	solid clay brick	MZ-NF	240/115/71	1.9	20
	solid calcium silicate brick	KSV-NF	240/115/71	1.8	25
hollow brick	hollow clay brick <i>Porotherm</i>	P+W	373/250/238	0.9	12
	hollow clay brick <i>Hueco Doble</i>	-	245/110/88	0.74	2,5
	hollow calcium silicate brick	KSL-R-12-1,2-16DF	239/248/239	1.3	15

It is possible to use other bricks after job site tests conducted according to *Annex B* of ETAG 029.

Setting parameters

bar size		M8	M10	M12
sleeve		BR16x85	BR16x85	BR20x85
hole diameter	d_0 mm	16	16	16
hole depth	h_1 mm	90	90	90
effective anchorage depth	h_{ef} mm	85	85	85
tightening torque	T_{inst} Nm	2	2	2

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bar size			M8	M10	M12
solid clay brick	spacing parallel to horizontal joint	$S_{cr \parallel} = S_{min \parallel}$ mm	255	255	255
	spacing perpendicular to horizontal joint	$S_{cr \perp} = S_{min \perp}$ mm	255	255	255
	edge distance	$C_{cr} = C_{min}$ mm	128	128	128
solid calcium silicate brick	spacing parallel to horizontal joint	$S_{cr \parallel} = S_{min \parallel}$ mm	255	255	255
	spacing perpendicular to horizontal joint	$S_{cr \perp} = S_{min \perp}$ mm	255	255	255
	edge distance	$C_{cr} = C_{min}$ mm	128	128	128
hollow clay brick <i>Porotherm</i>	spacing parallel to horizontal joint	$S_{cr \parallel} = S_{min \parallel}$ mm	373	373	373
	spacing perpendicular to horizontal joint	$S_{cr \perp} = S_{min \perp}$ mm	238	238	238
	edge distance	$C_{cr} = C_{min}$ mm	100	100	120
hollow clay brick <i>Hueco Doble</i>	spacing parallel to horizontal joint	$S_{cr \parallel} = S_{min \parallel}$ mm	245	245	245
	spacing perpendicular to horizontal joint	$S_{cr \perp} = S_{min \perp}$ mm	110	110	110
	edge distance	$C_{cr} = C_{min}$ mm	100	100	120
hollow calcium silicate brick	spacing parallel to horizontal joint	$S_{cr \parallel} = S_{min \parallel}$ mm	239	239	239
	spacing perpendicular to horizontal joint	$S_{cr \perp} = S_{min \perp}$ mm	248	248	248
	edge distance	$C_{cr} = C_{min}$ mm	100	100	120

Strength data

For installation and use on dry masonry and work temperature II (minimum temperature -40 °C, maximum short term temperature +80 °C; long term +50 °C)

Valid for a single anchor far from the edges.

Characteristic resistance under tension and shear (kN)

bar size			M8	M10	M12
solid clay brick	$N_{Rk} = V_{Rk}$		3.0	3.0	3.0
solid calcium silicate brick	$N_{Rk} = V_{Rk}$		3.0	3.0	3.0
hollow clay brick <i>Porotherm</i>	$N_{Rk} = V_{Rk}$		2.0	2.0	2.5
hollow clay brick <i>Hueco Doble</i>	$N_{Rk} = V_{Rk}$		0.9	1.2	1.5
hollow calcium silicate brick	$N_{Rk} = V_{Rk}$		2.0	2.0	2.5

Design resistance under tension and shear (kN)

bar size			M8	M10	M12
solid clay brick	$N_{Rd} = V_{Rd}$		1.2	1.2	1.2
solid calcium silicate brick	$N_{Rd} = V_{Rd}$		1.2	1.2	1.2
hollow clay brick <i>Porotherm</i>	$N_{Rd} = V_{Rd}$		0.80	0.80	1.0
hollow clay brick <i>Hueco Doble</i>	$N_{Rd} = V_{Rd}$		0.36	0.48	0.60
hollow calcium silicate brick	$N_{Rd} = V_{Rd}$		0.80	0.80	1.0

Recommended load under tension and shear (kN)

bar size			M8	M10	M12
solid clay brick	$N_{rec} = V_{rec}$		0.86	0.86	0.86
solid calcium silicate brick	$N_{rec} = V_{rec}$		0.86	0.86	0.86
hollow clay brick <i>Porotherm</i>	$N_{rec} = V_{rec}$		0.57	0.57	0.71
hollow clay brick <i>Hueco Doble</i>	$N_{rec} = V_{rec}$		0.26	0.34	0.43
hollow calcium silicate brick	$N_{rec} = V_{rec}$		0.57	0.57	0.71

1 kN ≈ 100 kg

 Characteristic resistance N_{Rk} and V_{Rk} derive from European Technical Assessment ETA 16/0919. Design resistances N_{Rd} and V_{Rd} include partial safety factor on strengths of 2.5. Recommended values N_{rec} and V_{rec} include the further 1.4 safety factor.

For the design of fixing with reduced spacing or near the edge, or groups of two or more fixings and for the resistance of a bar under shear with lever arm refer to ETA 16/0919 or to Declaration of Performance DPGE1008 and use the design method A outlined in Annex C of ETAG 029 (issued by EOTA).