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Declaration of Performance

No. **DPGEB1008** v5

1. Unique identification code of the product-type: **Gebofix PRO VE-SF**

2. Intended uses:

Intended use of the construction product according to ETA 16/0600	
Generic type:	Bonded injection type anchor for use in non-cracked and cracked concrete
Anchorages subject to:	Static and quasi-static loads: threaded rod M8, M10, M12, M16, M20, M24, M27, M30 reinforcing bar Ø8, Ø10, Ø12, Ø16, Ø20, Ø25, Ø32
Base materials:	- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000 - Strength class C20/25 to C50/60 according to EN 206-1:2000 - Non-cracked concrete threaded rod M8, M10, M12, M16, M20, M24, M27, M30 reinforcing bar Ø8, Ø10, Ø12, Ø16, Ø20, Ø25, Ø32 - Cracked concrete threaded rod M12, M16, M20, M24
Service temperature range:	I: -40 °C to +40 °C (max. short term temperature +40 °C and max. long term temperature +24 °C) II: -40 °C to +80 °C (max. short term temperature +80 °C and max. long term temperature +50 °C)
Environmental conditions:	- Elements made of zinc coated or hot-dip galvanized steel, class 4.6, 5.8 or 8.8 dry internal conditions - Elements made of stainless steel A2-70, A4-70 or A4-80 dry internal conditions, external atmospheric exposure (including industrial and marine environment) or exposure to permanently damp internal conditions if no particular aggressive conditions exist - Elements made of high corrosion resistant steel, property class 70 dry internal conditions, external atmospheric exposure, permanently damp internal conditions or in other particular aggressive conditions, e.g. permanent, alternating immersion in seawater, splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used)
Installation:	1: Dry or wet concrete threaded rod M8, M10, M12, M16, M20, M24, M27, M30 reinforcing bar Ø8, Ø10, Ø12, Ø16, Ø20, Ø25, Ø32 2: Flooded holes threaded rod M8, M10, M12, M16 reinforcing bar Ø8, Ø10, Ø12, Ø16 Perforation by hammer drilling Overhead installation is allowed Installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on job site

Intended use of the construction product according to ETA 16/0599	
Generic type:	Injection system for post-installed connections of reinforcing bars in existing structures
Anchorages subject to:	Static and quasi-static loads, reinforcing bar Ø8, Ø10, Ø12, Ø14, Ø16, Ø20, Ø25, Ø28, Ø32
Base materials:	- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000 - Strength class C12/15 to C50/60 according to EN 206-1:2000 - Non-carbonated concrete - Maximum chloride content 0.40% (CL 0.40) according to EN 206-1:2000

Intended use of the construction product according to ETA 16/0599	
Service temperature range:	-40 °C to +80 °C (max. short term temperature +80 °C and max. long term temperature +50 °C)
Installation:	Dry or wet concrete Perforation by hammer drilling or compressed air drilling The installation of post-installed rebars shall be done only by suitable trained installer and under supervision on site. The conditions under which an installer may be considered as suitable trained and the conditions for supervision on site are up to the Member States in which the installation is done. Check the position of the existing rebars.

Intended use of the construction product according to ETA 16/0919	
Generic type:	Bonded injection type anchor for use in masonry
Anchorages subject to:	Static and quasi-static loads
Base materials:	Hollow brick masonry with plastic sieve sleeve
Service temperature range:	-40 °C to +80 °C (max. short term temperature +80 °C, max. long term temperature +50 °C)
Environmental conditions:	- Elements made of zinc coated, hot-dip galvanized or zinc diffusion coated steel, class 5.8, 8.8 or 10.9 - Elements made of stainless steel A2-70, A4-70 or A4-80 - Elements made of high corrosion resistant steel dry internal conditions
Use categories	Base material c: hollow masonry

	type acc. to EN 771	**L/W/H** [mm]	**min. density** ρ [kg/dm^3]	**min. compr. strength** f_b [N/mm^2]
c1. hollow clay brick	Porotherm P+W	373/250/238	0.9	12
c2. hollow clay brick	Hueco Doble	245/110/88	0.74	2.5

Installation and use
d/d: Installation and use in structures subject to dry, internal conditions
w/d: Installation in dry or wet substrate and use in structures subject to dry, internal conditions

3. Manufacturer: **G&B Fissaggi S.r.l.** C.so Savona 22, Villastellone (TO), Italia

5. System of AVCP: 1

6b.
European Assessment Document: ETAG 001 Part 1 and Part 5, edition 2013, used as EAD
European Technical Assessment: ETA 16/0600
European Technical Assessment: ETA 16/0599

European Assessment Document: ETAG 029, edition 2013, used as EAD
European Technical Assessment: ETA 16/0919
Technical Assessment Body: TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Notified body: 1020 TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.

7. Declared performances:

Declared performances according to ETAG 001:2013 Part 1 and Part 5, ETA 16/0600 (Design method Technical Report TR 029)

Threaded rod diameter						**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Essential characteristics						**Performance**							
Installation parameters													
d	Nominal diameter of bar				[mm]	8	10	12	16	20	24	27	30
d_0	Nominal diameter of drill bit				[mm]	10	12	14	18	22	26	30	35
d_{fix}	Diameter of clearance hole in the fixture				[mm]	9	12	14	18	22	26	30	33
$h_{ef,min}$	Minimum effective anchorage depth				[mm]	64	80	96	128	160	192	216	240
$h_{ef,max}$	Maximum effective anchorage depth				[mm]	160	200	240	320	400	480	540	600
h_1	Depth of the drilling hole				[mm]	h_{ef}							
h_{min}	Minimum thickness of the concrete member				[mm]	h_{ef} + 30 ≥ 100				h_{ef} + $2d_0$			
T_{inst}	Maximum installation torque				[Nm]	10	20	40	80	150	200	240	275
t_{fix}	Thickness of fixture				[mm]	0 to 1500							
s_{min}	Minimum spacing				[mm]	h_{ef} / 2							
c_{min}	Minimum edge distance				[mm]	h_{ef} / 2							
Tension steel failure mode													
$N_{Rk,s}$	Characteristic tension resistance of steel				[kN]	A_s x f_{uk}							
Combined pull-out and concrete failure mode													
Characteristic bond resistance													
non-cracked concrete	temp. I	dry and wet concrete	$\tau_{Rk,ucr}$		[N/mm²]	8.5	10.0	9.5	9.0	8.5	8.0	6.5	5.5
		flooded holes	$\tau_{Rk,ucr}$		[N/mm²]	6.0	7.5	7.5	7.0	NPD			
	temp. II	dry and wet concrete	$\tau_{Rk,ucr}$		[N/mm²]	6.5	7.5	7.5	7.5	7.5	7.0	6.5	5.5
		flooded holes	$\tau_{Rk,ucr}$		[N/mm²]	4.5	5.5	5.5	5.5	NPD			
cracked concrete	temp. I	dry and wet concrete	$\tau_{Rk,cr}$		[N/mm²]	NPD		4.5	4.5	4.5	4.5	NPD	
		flooded holes	$\tau_{Rk,cr}$		[N/mm²]	NPD		4.5	4.5	NPD			
	temp. II	dry and wet concrete	$\tau_{Rk,cr}$		[N/mm²]	NPD		3.0	3.0	3.0	3.0	NPD	
		flooded holes	$\tau_{Rk,cr}$		[N/mm²]	NPD		3.0	3.0	NPD			
$\psi_{c,C30/37}$	Increasing factor for concrete C30/37				[-]	1.04							
$\psi_{c,C40/50}$	Increasing factor for concrete C40/50				[-]	1.08							
$\psi_{c,C50/60}$	Increasing factor for concrete C50/60				[-]	1.10							
k_8	Factor acc. to CEN/TS 1992-4-5 sect. 6.2.2.3 in non-cracked concrete				[-]	10.1							
k_8	Factor acc. to CEN/TS 1992-4-5 sect. 6.2.2.3 in cracked concrete				[-]	NPD		7.2					
Concrete cone failure mode													
k_{ucr}	Factor acc. to CEN/TS 1992-4-5 sect. 6.2.3.1 in non-cracked concrete				[-]	10.1							
k_{cr}	Factor acc. to CEN/TS 1992-4-5 sect. 6.2.3.1 in cracked concrete				[-]	NPD		7.2					
$s_{cr,N}$	Critical spacing				[mm]	3.0 h_{ef}							

Threaded rod diameter			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
Essential characteristics			**Performance**							
$c_{cr,N}$	Critical edge distance	[mm]	1.5 h_{ef}							
Splitting failure mode										
$s_{cr,sp}$	Critical spacing	[mm]	2 $c_{cr,sp}$							
$c_{cr,sp}$	Critical edge distance for $h/h_{ef} \geq 2.0$	[mm]	1.0 h_{ef}							
	Critical edge distance for $2.0 > h/h_{ef} > 1.3$	[mm]	4.6 h_{ef} - 1.8 h							
	Critical edge distance for $h/h_{ef} \leq 1.3$	[mm]	2.26 h_{ef}							
Installation safety factor										
γ_{inst}	Safety factor, dry and wet concrete	[-]	1.2						1.4	
	Safety factor, flooded holes	[-]	1.4				NPD			
Shear steel failure mode without lever arm										
$V_{Rk,s}$	Characteristic shear resistance of steel	[kN]	0.5 x A_s x f_{uk}							
k_2	Ductility factor acc. to CEN/TS 1992-4-5 sect. 6.3.2.1	[-]	0.8							
Shear steel failure mode with lever arm										
$M^0_{Rk,s}$	Characteristic bending resistance of steel	[Nm]	1.2 x W_{el} x f_{uk}							
Concrete pry-out failure mode										
k / k_3	Factor in eq. (5.7) of TR029 / in eq. (27) of CEN/TS 1992-4-5 sect. 6.3.3	[-]	2.0							
γ_{inst}	Installation safety factor	[-]	1.0							
Concrete edge failure mode										
l_f	Effective length of anchor	[mm]	min(h_{ef}; 8 d_{nom})							
d_{nom}	Outside diameter of anchor	[mm]	8	10	12	16	20	24	27	30
γ_{inst}	Installation safety factor	[-]	1.0							
Displacement on tension load, non-cracked concrete										
N	Service tension load	[kN]	6.3	7.9	11.9	15.9	23.9	29.8	37.7	45.6
δ_{N0}	Short term displacement under tension load	[mm]	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5
$\delta_{N\infty}$	Long term displacement under tension load	[mm]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Displacement on tension load, cracked concrete										
N	Service tension load	[kN]	NPD		7.4	13.1	20.5	24.6	NPD	
δ_{N0}	Short term displacement under tension load	[mm]	NPD		0.7	0.7	0.7	0.6	NPD	
Displacement on shear load, non-cracked and cracked concrete										
V	Service shear load	[kN]	3.1	5.0	7.2	13.5	21.0	30.3	39.4	48.0
δ_{V0}	Short term displacement under shear load	[mm]	1.5	1.5	1.5	1.5	2.0	2.5	2.5	2.5
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	2.3	2.3	2.3	2.3	3.0	3.8	3.8	3.8

Reinforcing bar diameter			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Essential characteristics			**Performance**						
Installation parameters									
d	Nominal diameter of bar	[mm]	8	10	12	16	20	25	32
d_0	Nominal diameter of drill bit	[mm]	12	14	16	20	25	32	40

Reinforcing bar diameter					**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Essential characteristics					**Performance**						
$h_{ef,min}$	Minimum effective anchorage depth			[mm]	64	80	96	128	160	200	256
$h_{ef,max}$	Maximum effective anchorage depth			[mm]	160	200	240	320	400	480	640
h_1	Depth of the drilling hole			[mm]	h_{ef}						
h_{min}	Minimum thickness of the concrete member			[mm]	h_{ef} + 30 ≥ 100				h_{ef} + 2d_0		
s_{min}	Minimum spacing			[mm]	h_{ef} / 2						
c_{min}	Minimum edge distance			[mm]	h_{ef} / 2						
Tension steel failure mode											
$N_{Rk,s}$	Characteristic tension resistance of steel			[kN]	A_s x f_{uk}						
Combined pull-out and concrete failure mode											
Characteristic bond resistance											
non-cracked concrete	temp. I	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	8.5	10	10	9.0	9.0	9.0	5.5
		flooded holes	$\tau_{Rk,ucr}$	[N/mm²]	6.0	7.5	7.5	7.5	NPD		
	temp. II	dry and wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	6.5	7.5	7.5	7.5	7.0	7.0	5.0
		flooded holes	$\tau_{Rk,ucr}$	[N/mm²]	4.5	5.5	5.5	5.5	NPD		
$\psi_{c,C30/37}$	Increasing factor for concrete C30/37			[-]	1.04						
$\psi_{c,C40/50}$	Increasing factor for concrete C40/50			[-]	1.08						
$\psi_{c,C50/60}$	Increasing factor for concrete C50/60			[-]	1.10						
k_8	Factor acc. to CEN/TS 1992-4-5 sect. 6.2.2.3 in non-cracked concrete			[-]	10.1						
Concrete cone failure mode											
k_{ucr}	Factor acc. to CEN/TS 1992-4-5 sect. 6.2.3.1 in non-cracked concrete			[-]	10.1						
$s_{cr,N}$	Critical spacing			[mm]	3.0 h_{ef}						
$c_{cr,N}$	Critical edge distance			[mm]	1.5 h_{ef}						
Splitting failure mode											
$s_{cr,sp}$	Critical spacing			[mm]	2 $c_{cr,sp}$						
$c_{cr,sp}$	Critical edge distance for $h/h_{ef} \geq 2.0$			[mm]	1.0 h_{ef}						
	Critical edge distance for $2.0 > h/h_{ef} > 1.3$			[mm]	4.6 h_{ef} - 1.8 h						
	Critical edge distance for $h/h_{ef} \leq 1.3$			[mm]	2.26 h_{ef}						
Installation safety factor											
γ_{inst}	Safety factor, dry and wet concrete			[-]	1,2						
	Safety factor, flooded holes			[-]	1.4				NPD		

Reinforcing bar diameter			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
Essential characteristics			**Performance**						
Shear steel failure mode without lever arm									
$V_{Rk,s}$	Characteristic shear resistance of steel	[kN]	$0.50 \cdot A_s \cdot f_{uk}$						
k_2	Ductility factor acc. to CEN/TS 1992-4-5 sect. 6.3.2.1	[-]	0.8						
Shear steel failure mode with lever arm									
$M^0_{Rk,s}$	Characteristic bending resistance of steel	[Nm]	$1.2 \cdot W_{el} \cdot f_{uk}$						
Concrete pry-out failure mode									
k / k_3	Factor in eq. (5.7) of TR029 / in eq. (27) of CEN/TS 1992-4-5 sect.. 6.3.3	[mm]	2.0						
γ_{inst}	Installation safety factor	[-]	1.0						
Concrete edge failure mode									
l_f	Effective length of anchor	[mm]	$\min(h_{ef}; 8\ d_{nom})$						
d_{nom}	Outside diameter of anchor	[mm]	8	10	12	16	20	25	32
γ_{inst}	Installation safety factor	[-]	1.0						
Displacement on tension load, non-cracked concrete									
N	Service tension load	[kN]	7.9	9.9	13.9	23.8	29.8	55.6	55.6
δ_{N0}	Short term displacement under tension load	[mm]	0.3	0.3	0.3	0.4	0.4	0.5	0.5
$\delta_{N\infty}$	Long term displacement under tension load	[mm]	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Displacement on shear load, non-cracked concrete									
V	Service shear load	[kN]	5.9	9.3	13.3	23.7	37.0	57.9	94.8
δ_{V0}	Short term displacement under shear load	[mm]	0.3	0.4	0.4	0.4	0.4	0.5	0.9
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	0.5	0.6	0.6	0.6	0.6	0.8	1.4

Declared performances according to ETAG 001:2013 Part 1 and Part 5, ETA 16/0599 (Design method EN 1992-1-1:2004)

Reinforcing bar diameter				**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**
Essential Characteristics				**Performance**								
Installation parameters												
d_s	Nominal diameter of bar		[mm]	8	10	12	14	16	20	25	28	32
d_0	Nominal diameter of drill bit		[mm]	12	14	16	18	20	25	32	35	40
min c	Minimum concrete cover	hammer drilling without drilling aid	[mm]	$30 + 0.06 \cdot l_v \geq 2 \cdot d_s$						$40 + 0.06 \cdot l_v \geq 2 \cdot d_s$		
		hammer drilling with drilling aid	[mm]	$30 + 0.02 \cdot l_v \geq 2 \cdot d_s$						$40 + 0.02 \cdot l_v \geq 2 \cdot d_s$		
		compressed air drilling without drilling aid	[mm]	$50 + 0.08 \cdot l_v$						$60 + 0.08 \cdot l_v$		
		compressed air drilling with drilling aid	[mm]	$50 + 0.02 \cdot l_v$						$60 + 0.02 \cdot l_v$		

Reinforcing bar diameter				**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**
Essential Characteristics				**Performance**								
$l_{b,min}$	Factor for $l_{b,min}$ and $l_{0,min}$ related to concrete class and drilling method		[-]	1.0								
$l_{v,max}$	Maximum installation length		[mm]	400	500	600	700	800	1000	1000	1000	1000
Bond resistance												
f_{bd}	Design ultimate bond resistance for all drilling methods and good conditions	C12/15	[N/mm²]	1.6							1.6	
		C16/20	[N/mm²]	2.0							2.0	
		C20/25	[N/mm²]	2.3							2.3	
		C25/30	[N/mm²]	2.7							2.3	
		C30/37	[N/mm²]	3.0							2.3	
		C35/45	[N/mm²]	3.0							2.3	
		C40/50	[N/mm²]	3.0							2.3	
		C45/55	[N/mm²]	3.0							2.3	
		C50/60	[N/mm²]	3.0							2.3	

Declared performances according to ETAG 029:2013, ETA 16/0919 (Design method A - ETAG 029 Annex C)

Threaded rod diameter				**M8**	**M10**	**M12**
Essential characteristics				**Performance**		
Installation parameters						
d_s	Sleeve diameter		[mm]	16	16	20
l_s	Sleeve length		[mm]	85	85	85
d_0	Nominal diameter of drill bit		[mm]	16	16	20
h_{ef}	Effective anchorage depth		[mm]	85	85	85
h_{nom}	Installation depth of sleeve		[mm]	85	85	85
h_1	Depth of the drilling hole		[mm]	90	90	90
d_{fix}	Diameter of clearance hole in the fixture		[mm]	9	12	14
T_{inst}	Maximum installation torque		[Nm]	2	2	2
Edge distances and spacings						
c_{min} c_{cr}	Minimum and critical edge distance	c1 brick	[mm]	100	100	120
		c2 brick	[mm]	100	100	120
$s_{min,II}$ $s_{cr,II}$	Minimum and critical spacing, parallel to horizontal joint	c1 brick	[mm]	373	373	373
		c2 brick	[mm]	245	245	245
$s_{min,\perp}$ $s_{cr,\perp}$	Minimum and critical spacing, perpendicular to horizontal joint	c1 brick	[mm]	238	238	238
		c2 brick	[mm]	110	110	110
Tension and shear resistance, use category d/d and w/d						
N_{Rk}	Characteristic tension resistance	c1 brick	[kN]	2.0	2.0	2.5
		c2 brick	[kN]	0.9	1.2	1.5
V_{Rk}	Characteristic shear resistance	c1 brick	[kN]	2.0	2.0	2.5
		c2 brick	[kN]	0.9	1.2	1.5

Threaded rod diameter				**M8**	**M10**	**M12**
Essential characteristics				**Performance**		
$M_{Rk,s}$	Characteristic bending resistance, steel grade 5.8		[kN]	19	37	66
	Characteristic bending resistance, steel grade 8.8		[kN]	30	60	105
	Characteristic bending resistance, steel grade 10.9		[kN]	37	75	131
	Characteristic bending resistance, stainless steel and high corrosion resistant steel grade 70		[kN]	26	52	92
	Characteristic bending resistance, stainless steel grade 80		[kN]	30	60	105
Displacement on tension and shear load						
N	Service tension load		[kN]	$N_{Rk}/(1.4 \cdot \gamma_M)$		
δ_{N0}	Short term displacement under tension load	c1 brick	[mm]	0.5		
		c2 brick		0.5		
$\delta_{N\infty}$	Long term displacement under tension load	c1 brick	[mm]	1.0		
		c2 brick		1.0		
Displacement on shear load						
V	Service shear load		[kN]	$V_{Rk}/1.4 \cdot \gamma_M$		
δ_{V0}	Short term displacement under shear load [1]	c1 brick	[mm]	1.0		
		c2 brick		1.0		
$\delta_{V\infty}$	Long term displacement under shear load [1]	c1 brick	[mm]	1.5		
		c2 brick		1.5		
β-factor for job site tests according to ETAG 029, Annex B						
β	β-factor	b1 brick	[-]	0.83		
		b2 brick	[-]	0.78		

[1] the hole gap between bolt and fixture shall be considered additionally

The performance of the product identified above is in conformity with the set of declared performances. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Andrea Maggioni, General manager

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Villastellone, 12 December 2016