

Declaration of Performance

No. **DPGEB1018 v2**

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

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
Anchorage 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:	<ul style="list-style-type: none"> - 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:	<ul style="list-style-type: none"> - 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

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

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 o CEN/TS 1992-4:2009)

Threaded rod diameter			M8	M10	M12	M16	M20	M24	M27	M30		
Essential characteristics			Performance									
<i>Installation parameters</i>												
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									
<i>Tension steel failure mode</i>												
N _{Rk,s}	Characteristic tension resistance of steel	[kN]	A _s × f _{uk}									
<i>Combined pull-out and concrete failure mode</i>												
Characteristic bond resistance												
non-cracked concrete	temp. I	dry and wet concrete	τ _{Rk,ucr}	[N/mm ²]	8.5	10.0	9.5	9.0	8.5	8.0	6.5	5.5
		flooded holes	τ _{Rk,ucr}	[N/mm ²]	6.0	7.5	7.5	7.0	NPD			
	temp. II	dry and wet concrete	τ _{Rk,ucr}	[N/mm ²]	6.5	7.5	7.5	7.5	7.5	7.0	6.5	5.5
		flooded holes	τ _{Rk,ucr}	[N/mm ²]	4.5	5.5	5.5	5.5	NPD			
cracked concrete	temp. I	dry and wet concrete	τ _{Rk,cr}	[N/mm ²]	NPD		4.5	4.5	4.5	4.5	NPD	
		flooded holes	τ _{Rk,cr}	[N/mm ²]	NPD		4.5	4.5	NPD			
	temp. II	dry and wet concrete	τ _{Rk,cr}	[N/mm ²]	NPD		3.0	3.0	3.0	3.0	NPD	
		flooded holes	τ _{Rk,cr}	[N/mm ²]	NPD		3.0	3.0	NPD			
ψ _{c,C30/37}	Increasing factor for concrete C30/37	[-]	1.04									
ψ _{c,C40/50}	Increasing factor for concrete C40/50	[-]	1.08									
ψ _{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					
<i>Concrete cone failure mode</i>												
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					

Threaded rod diameter			M8	M10	M12	M16	M20	M24	M27	M30	
$s_{cr,N}$	Critical spacing	[mm]	3.0 h_{ef}								
$c_{cr,N}$	Critical edge distance	[mm]	1.5 h_{ef}								
<i>Splitting failure mode</i>											
$s_{cr,sp}$	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}								
<i>Installation safety factor</i>											
γ_{inst}	Safety factor, dry and wet concrete	[-]	1.2						1,4		
	Safety factor, flooded holes	[-]	1.4				NPD				
<i>Shear steel failure mode without lever arm</i>											
$V_{Rk,s}$	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								
<i>Shear steel failure mode with lever arm</i>											
$M^0_{Rk,s}$	Characteristic bending resistance of steel	[Nm]	1.2 x W_{el} x f_{uk}								
<i>Concrete pry-out failure mode</i>											
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								
<i>Concrete edge failure mode</i>											
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								
<i>Displacement on tension load, non-cracked concrete</i>											
F	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	
<i>Displacement on tension load, cracked concrete</i>											
F	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		
<i>Displacement on shear load, non-cracked and cracked concrete</i>											
F	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							
<i>Installation parameters</i>											
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	
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							
<i>Tension steel failure mode</i>											
N _{Rk,s}	Characteristic tension resistance of steel	[kN]		A _s x f _{uk}							
<i>Combined pull-out and concrete failure mode</i>											
Characteristic bond resistance											
non-cracked concrete	temp. I	dry and wet concrete	τ _{Rk,ucr}	[N/mm ²]	8.5	10	10	9.0	9.0	9.0	5.5
		flooded holes	τ _{Rk,ucr}	[N/mm ²]	6.0	7.5	7.5	7.5	NPD		
	temp. II	dry and wet concrete	τ _{Rk,ucr}	[N/mm ²]	6.5	7.5	7.5	7.5	7.0	7.0	5.0
		flooded holes	τ _{Rk,ucr}	[N/mm ²]	4.5	5.5	5.5	5.5	NPD		
ψ _{c,C30/37}	Increasing factor for concrete C30/37	[-]		1.04							
ψ _{c,C40/50}	Increasing factor for concrete C40/50	[-]		1.08							
ψ _{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							
<i>Concrete cone failure mode</i>											
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}							
<i>Splitting failure mode</i>											
s _{cr,sp}	Critical spacing	[mm]		2 c _{cr,sp}							
c _{cr,sp}	Critical edge distance for h/h _{ef} ≥ 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} ≤ 1.3	[mm]		2.26 h _{ef}							

Reinforcing bar diameter			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Essential characteristics			Performance						
<i>Installation safety factor</i>									
γ_{inst}	Safety factor, dry and wet concrete	[-]	1,2						
	Safety factor, flooded holes	[-]	1.4				NPD		
<i>Shear steel failure mode without lever arm</i>									
$V_{Rk,s}$	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						
<i>Shear steel failure mode with lever arm</i>									
$M^0_{Rk,s}$	Characteristic bending resistance of steel	[Nm]	$1.2 \cdot W_{el} \cdot f_{uk}$						
<i>Concrete pry-out failure mode</i>									
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						
<i>Concrete edge failure mode</i>									
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						
<i>Displacement on tension load, non-cracked concrete</i>									
F	Service tension load	[kN]	7.9	9.9	13.9	23.8	29.8	55.6	55.6
δ_{NO}	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
<i>Displacement on shear load, non-cracked concrete</i>									
F	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

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

Villastellone, 7 October 2016



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