DECLARATION OF PERFORMANCE

SM0BS002

CE

- *Unique identification code of the product-type:*
  TURBO SMART concrete screw

- *Type or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4):*
  See annex 1 to this document

- *Intended uses of the construction product, in accordance with the applicable harmonized technical specification as foreseen by the manufacturer:*

Intended use or uses of the construction product according to ETAG 001-6	
Generic type	Concrete screws “TURBO SMART”
Base material	Cracked and non-cracked concrete; reinforced and unreinforced concrete C20/25 to C50/60 acc. to EN 206-1:2000-12 Prestressed hollow core slabs (TURBO SMART 6)
Material:	Carbon steel, zinc plated or zinc flake coating : ISO 4042 A2K ≥ 5µm Stainless steel A4 (1.4401, 1.4404, 1.4571, 1.4578) Stainless steel HCR (1.4529)
Durability	• Internal dry conditions : all type of screws • Structural subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition no particular aggressive conditions exits: screw types made of stainless steel with marking A4, • Structural subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition if particular aggressive conditions exits: screw types made of stainless steel with marking HCR
Loading	static or quasi-static loads, used for multiple use for non-structural applications.
Fire Resistance	F120 (TURBO SMART 6)
Assumed working life	50 years

- *Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11 (5):*
  pgb-Polska

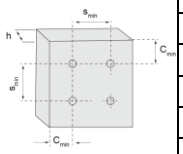
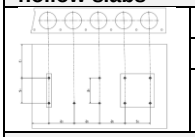
- *System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:*
  System 2+

- *In case of the declaration of performance concerning a construction product for which European Technical Assessment has been issued:*

ETA - 16/0452 issued by	DIBt - Deutsches Institut für Bautechnik
On the basis of	ETAG 001 part 6
Under System	2+
And issued	1343-CPR-M 565-2/16.06

Declared performance – Essential characteristics – Performances

- **Characteristic values for design method A according to ETAG001, Annex C or according to CEN/TS 1992-4**

TURBO SMART		**ANCHOR SIZE**		**5**	**6**	
	h_{nom}	**Nominal embedment depth**	**[mm]**	**35**	**1** **40**	**2** **55**
Installation parameters in concrete						
	d_0	Nominal diameter of drill bit	[mm]	5	6	
	d_s	Thread diameter	[mm]	6,5	7,5	
	d_f	Fixture clearance hole diameter	[mm]	7	8	
	T_{inst}	Installation torque	[Nm]	8	10	
		Max. torque for impact screw driver	[Nm]	140	160	
	h_1	Depth of drilled hole	[mm]	40	40	60
	h_{min}	Min. thickness of concrete member	[mm]	80	80	100
	s_{min}	Minimum spacing	[mm]	35	35	40
	c_{min}	Minimum edge distance	[mm]	35	35	40
Installation parameters in precast prestressed hollow slabs						
	s_{min}	Minimum spacing	[mm]	-	≥100	≥100
	c_{min}	Minimum edge distance	[mm]	-	≥100	≥100
	a_{min}	Minimum distance between anchor groups	[mm]	-	≥100	≥100
Steel failure						
	$N_{Rk,s}$	Tension characteristic resistance	[kN]	8,7	14	
	$V_{Rk,s}$	Shear characteristic resistance	[kN]	4,4	7	
	k_2	Ductility factor [1]	[-]	0,8	0,8	
	$M^0_{Rk,s}$	Characteristic resistance	[Nm]	5.3	10.9	
Pull-out failure						
	$N_{Rk,p,cr}$	Tension characteristic resistance in CRACKED and UNCRACKED concrete C20/25	[kN]	1,5	1,5	7,5
	γ_{Mp}	Partial safety factor [1]	[-]	1,0	1,0	
	Ψ_C	Increasing factor C30/37	[-]	1,22	1,22	
		Increasing factor C40/50	[-]	1,41	1,41	
		Increasing factor C50/60	[-]	1,55	1,55	
Concrete cone and splitting failure						
	h_{ef}	Effective anchorage depth	[mm]	27	27	44
	$s_{cr,N}$	Critical spacing	[mm]	81	81	132
	$s_{cr,sp}$	Critical spacing (splitting)	[mm]	120	120	160
	$c_{cr,N}$	Critical edge distance	[mm]	41	41	66
	$c_{cr,sp}$	Critical edge distance (splitting)	[mm]	60	60	80
	γ_2	Installation safety factor [2]	[-]	1,2	1,2	1,0
Concrete pry out failure						
	k	k-Factor	[-]	1,0	1,0	1,0
Concrete edge failure						
	l_f	Effective anchor length	[mm]	27	27	44
	d_{nom}	Outside anchor diameter	[mm]	5	6	6

[1] Ductility factor acc. to CEN/TS. 1992-4-5 sect. 6.3.2.1
[2] Parameter relevant only for design according to ETAG 001, Annex C

- **Characteristic values of resistance in precast prestressed hollow core slabs C30/37-C50/60**

TURBO SMART	ANCHOR SIZE		6		
Bottom flange thickness	d_b	[mm]	≥25	≥30	≥35
Characteristic resistance	F^0_{Rk}	[kN]	1	2	3
Installation safety factor	γ_2 [3] = γ_{inst} [4]	[-]	1,2		

- **Characteristic tension resistance in cracked and non-cracked concrete C20/25 to C50/60 under fire exposure (not for using in prestressed hollow core slabs)**

TURBO SMART	ANCHOR SIZE			6			
				Carbon steel		Stainless steel A4/HCR	
Nominal embedment depth h_{nom} [mm]				1	2	1	2
				35mm	55mm	35mm	55mm
Steel failure for tension and shear load ($F_{Rk,fi}$ = $N_{Rk,s,fi}$ = $V_{Rk,fi}$)							
Fire resistance class	**Characteristic resistance**						
R30	$F_{Rk,fi\ 30}$		[kN]	0,9		1,2	
R60	$F_{Rk,fi\ 60}$		[kN]	0,8		1,2	
R90	$F_{Rk,fi\ 90}$		[kN]	0,6		1,2	
R120	$F_{Rk,fi\ 120}$		[kN]	0,4		0,8	
Steel failure with lever arm							
Fire resistance class	**Characteristic resistance**						
R30	$M^0_{Rk,s,fi\ 30}$		[kN]	0,7		0,9	
R60	$M^0_{Rk,s,fi\ 60}$		[kN]	0,6		0,9	
R90	$M^0_{Rk,s,fi\ 90}$		[kN]	0,5		0,9	
R120	$M^0_{Rk,s,fi\ 120}$		[kN]	0,3		0,6	
R 30 to R 120	Spacing	$s_{cr,fi}$	[mm]	2 x h_{ef}		2 x h_{ef}	
	Edge distance	$c_{cr,fi}$		4 x h_{ef}		4 x h_{ef}	

The characteristic resistance to fire exposure for pull-out failure, concrete cone failure, concrete pry-out failure and concrete edge failure shall be calculated according to TR 020 or CEN/TS 1992-4

- *The performances of the product identified by the above identification code are in conformity with the declared performance. This declaration of performance is issued under the sole responsibility of pgb-Europe nv. Signed for and behalf of the manufacturer by:*

Place and date of issue	Signature
Melle, 28/06/2016	nv pgb-Europe sa Gontrode Heirweg 170 9090 MELLE BE 0425 888 396 Johannes Heye, product manager

[3] Parameter relevant only for design according to ETAG 001, Annex C
[4] Ductility factor acc. to CEN/TS. 1992-4:2009

Annex 1 : Product overview

SMBSZ:
CONCRETE SCREW "TURBO SMART" WITH HEXAGON HEAD AND PRESSED-ON WASHER

Carton box packing - Kartonverpakking - Boîte carton

size	pgb code	EAN13	
5x40	SM0BSZ0140500403	5902134198330	100
5x50	SM0BSZ0140500503	5902134198347	100
5x60	SM0BSZ0140500603	5902134198354	100
6x40	SM0BSZ0140600403	5902134198361	100
6x50	SM0BSZ0140600503	5902134198378	100
6x60	SM0BSZ0140600603	5902134198385	100
6x80	SM0BSZ0140600803	5902134198392	100
6x100	SM0BSZ0140601003	5902134198408	100

Carton box packing - Kartonverpakking - Boîte carton

size	pgb code	EAN13	
6x50	SM0BSZB000600503	5902134198736	50
6x60	SM0BSZB000600603	5902134198743	50

SMBSV:
CONCRETE SCREW "TURBO SMART" WITH COUNTERSUNK HEAD

Carton box packing - Kartonverpakking - Boîte carton

size	pgb code	EAN13	
5x40	SM0BSV0010500403	5902134198804	100
5x50	SM0BSV0010500503	5902134198811	100
5x60	SM0BSV0010500603	5902134198828	100
6x40	SM0BSV0010600403	5902134198835	100
6x50	SM0BSV0010600503	5902134198842	100
6x60	SM0BSV0010600603	5902134198859	100
6x80	SM0BSV0010600803	5902134198866	100
6x100	SM0BSV0010601003	5902134198873	100
6x120	SM0BSV0010601203	5902134198880	100
6x140	SM0BSV0010601403	5902134198897	100

Carton box packing - Kartonverpakking - Boîte carton

size	pgb code	EAN13	
6x50	SM0BSVB000600503	5902134198927	100
6x65	SM0BSVB000600653	5902134198934	100
6x85	SM0BSVB000600853	5902134198941	100
6x105	SM0BSVB000601053	5902134198958	100

SMBSP:
CONCRETE SCREW "TURBO SMART" WITH PAN HEAD

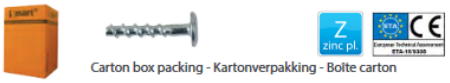
Carton box packing - Kartonverpakking - Boîte carton

size	pgb code	EAN13	
5x40	SM0BSP0010500403	5902134198989	100
5x50	SM0BSP0010500503	5902134198996	100
5x60	SM0BSP0010500603	5902134199009	100
6x40	SM0BSP0010600403	5902134199016	100
6x50	SM0BSP0010600503	5902134199023	100
6x60	SM0BSP0010600603	5902134199030	100
6x80	SM0BSP0010600803	5902134199047	100
6x100	SM0BSP0010601003	5902134199054	100

Carton box packing - Kartonverpakking - Boîte carton

size	pgb code	EAN13	
6x50	SM0BSPB000600503	5902134199061	100
6x60	SM0BSPB000600603	5902134199078	100
6x80	SM0BSPB000600803	5902134199085	100
6x100	SM0BSPB000601003	5902134199092	100

SMBSF:
CONCRETE SCREW "TURBO SMART" WITH LARGE PAN HEAD FOR RAIL CONNECTIONS



Carton box packing - Kartonverpakking - Boîte carton

size	pgb code	EAN13	
6x40	SM0BSF0010600403	5902134199108	100
6x60	SM0BSF0010600603	5902134199115	100

SMBSI:
CONCRETE SCREW "TURBO SMART" WITH METRIC INTERNAL THREAD

Carton box packing - Kartonverpakking - Boîte carton

size	pgb code	EAN13	
6x35	SM0BSI0010600353	5902134199245	50
6x55	SM0BSI0010600553	5902134199252	50

SMBSB:
CONCRETE SCREW "TURBO SMART" WITH HEX HEAD WITH METRIC CONNECTION THREAD

Carton box packing - Kartonverpakking - Boîte carton

size	pgb code	EAN13	
6x35	SM0BSB0010600353	5902134199160	100
6x55	SM0BSB0010600553	5902134199177	100
6x75	SM0BSB0010600753	5902134199184	100
6x95	SM0BSB0010600953	5902134199191	100