

## SMZAV001



- *Unique identification code of the product-type:*  
**SMART S-ZAV**
- *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 EAD 330232-00-0601	
Generic type	High load torque controlled expansion anchor
Base material	Cracked and non-cracked concrete Reinforced or unreinforced normal weight concrete C20/25 to C50/60 acc. to EN 206-1:2003
Material:	Zinc plated steel, min 5 µm
Durability	Internal dry conditions
Anchorage subject to	Static or quasi-static loads Seismic actions for Performance Category C1 and C2 <u>Fire exposure</u>
Fire Resistance	R30-R120
Reaction to fire	A1, in acc. with 96/603/EC
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 sp. z o.o. – Ul. F.W. Redena 3 – 41-807 Zabrze – Polska**
- *System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:*  
**System 1**
- *In case of the declaration of performance concerning a construction product for which European Technical Assessment has been issued:*

ETA - 17/0784 issued by	DIBt
Body nr	1343
On the basis of	EAD 330232-00-0601
Under System	1
And issued	06/10/2017

*Declared performance – Essential characteristics – Performances*

Installation parameters						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
d <sub>0</sub>	Nominal diameter of drill bit	[mm]	10	12	15	18
h <sub>ef</sub>	Effective embedment depth	[mm]	50	60	71	80
d <sub>f</sub>	Fixture clearance hole diameter	[mm]	12	14	17	20
T <sub>inst</sub>	Installation torque	[Nm]	10	25	55	70
h <sub>1</sub>	Depth of drilled hole	[mm]	65	80	95	105
T <sub>fix</sub>	Fixture thickness	[mm]	8-200	10-200	14-200	18-250
h <sub>min</sub>	Min. thickness of concrete member	[mm]	100	120	140	160
S <sub>min,cr</sub>	Minimum spacing cracked concrete	[mm]	50	50	60	70
	for c ≥	[mm]	50	80	120	140
C <sub>min,cr</sub>	Minimum edge distance cracked concrete	[mm]	50	55	60	70
	for s ≥	[mm]	50	100	120	160
S <sub>min,ucr</sub>	Minimum spacing uncracked concrete	[mm]	50	60	60	70
	for c ≥	[mm]	80	100	120	140
C <sub>min,ucr</sub>	Minimum edge distance uncracked concrete	[mm]	50	60	60	70
	for s ≥	[mm]	100	120	120	160

Tension load: steel failure						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
N <sub>rk,s</sub>	Steel characteristic resistance	[kN]	16	29	46	67
γ <sub>Ms</sub>	Partial safety factor	[-]	1,5			
Tension load: pull out failure						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
N <sub>rk,p,cr</sub>	Characteristic resistance in CRACKED concrete C20/25	[kN]	5	12	16	ND
γ <sub>Mp</sub>	Partial safety factor	[-]	1,5			
ψ <sub>C</sub>	Increasing factor C30/37	[-]	1,22			
ψ <sub>C</sub>	Increasing factor C40/50	[-]	1,41			
ψ <sub>C</sub>	Increasing factor C50/60	[-]	1,58			
N <sub>rk,p,ucr</sub>	Characteristic resistance in NON-CRACKED concrete C20/25	[kN]	ND	20	ND	ND
γ <sub>Mp</sub>	Partial safety factor	[-]	1,5			
ψ <sub>C</sub>	Increasing factor C30/37	[-]	1,22			
ψ <sub>C</sub>	Increasing factor C40/50	[-]	1,41			
ψ <sub>C</sub>	Increasing factor C50/60	[-]	1,58			

Tension load: splitting failure						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
case 1						
$N_{Rk,sp}^0$	Characteristic resistance in uncracked concrete C20/25	[kN]	12	16	25	30
$C_{cr,sp}$	Critical edge distance	[mm]	75	90	107	120
case 2						
$N_{Rk,sp}^0$	Characteristic resistance in uncracked concrete C20/25	[kN]	17,4	20,0	29,4	35,2
$C_{cr,sp}$	Critical edge distance	[mm]	125	150	178	200
Tension load: concrete cone failure						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$h_{ef}$	Effective embedment depth	[mm]	50	60	71	80
$k_{cr,N,cr}$	Factor k1 for cracked concrete	[-]	7,7			
$k_{cr,N,ucr}$	Factor k1 for uncracked concrete	[-]	11,0			
Tension load: displacements						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$F_{cr}$	Service tension load in CRACKED concrete	[kN]	2,4	5,7	7,6	12,3
$\delta_{N0}$	Displacements under short term	[mm]	0,5	0,5	0,5	0,7
$\delta_{N\infty}$	Displacements under long term	[mm]	2	2	1,3	1,3
$F_{ucr}$	Service tension load in UNCRACKED concrete	[kN]	8,5	9,5	14,3	17,2
$\delta_{N0}$	Displacements under short term	[mm]	0,8	1	1,1	1,1
$\delta_{N\infty}$	Displacements under long term	[mm]	3,4	3,4	1,7	1,7

Shear load: steel failure without lever arm						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$V_{rk,s}$	Steel characteristic resistance	[kN]	18	30	48	73
$\gamma_{Ms}$	Partial safety factor	[-]	1,25			
Shear load: steel failure with lever arm						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$M_{Rk,s}^0$	Characteristic resistance	[Nm]	12	30	60	105
$\gamma_{Ms}$	Partial safety factor	[-]	1,25			
Shear load: concrete pryout failure						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$k_s$	K factor	[-]	1,8	2,0	2,0	2,0

Shear load: concrete edge failure						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$l_f$	Effective anchorage length under shear loads	[mm]	50	60,0	71,0	80,0
$d_{nom}$	Outside anchor diameter	[mm]	10	12	15	18
Shear load: displacements						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
V	Service shear load	[kN]	10,1	17,1	27,5	41,5
$\delta_{No}$	Displacements under short term	[mm]	2,9	2,5	3,6	3,5
$\delta_{N\infty}$	Displacements under long term	[mm]	4,4	3,8	5,4	5,3



## Characteristic resistance in cracked and non-cracked concrete C20/25 to C50/60 under fire exposure

Tension load: steel failure						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$N_{Rk,s,fi}$	Characteristic resistance					
	R30	[kN]	1,0	1,9	4,3	6,3
	R60	[kN]	0,8	1,5	3,2	4,6
	R90	[kN]	0,6	1,0	2,1	3,0
	R120	[kN]	0,4	0,8	1,5	2,0
Shear load: steel failure without lever arm						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$V_{Rk,s,fi}$	Characteristic resistance					
	R30	[kN]	1,0	1,9	4,3	6,3
	R60	[kN]	0,8	1,5	3,2	4,6
	R90	[kN]	0,6	1,0	2,1	3,0
	R120	[kN]	0,4	0,8	1,5	2,0
Shear load: steel failure with lever arm						
			Ø 10/ M6	Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$V_{Rk,s,fi}$	Characteristic resistance					
	R30	[Nm]	0,8	2,0	5,6	9,7
	R60	[Nm]	0,6	1,5	4,1	7,2
	R90	[Nm]	0,4	1,0	2,7	4,7
	R120	[Nm]	0,3	0,8	1,9	3,1



## Characteristic values for seismic action

Tension load: steel failure					
			Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$N_{Rk,s,eq,C1}$	Characteristic tension resistance category C1	[kN]	29	46	67
$N_{Rk,s,eq,C2}$	Characteristic tension resistance category C2	[kN]	29	46	67
$\gamma_{Ms}$	Partial safety factor	[-]	1,5		
Tension load: pull out failure					
			Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$N_{Rk,p,eq,C1}$	Characteristic tension resistance category C1	[kN]	12	16	25
$N_{Rk,p,eq,C2}$	Characteristic tension resistance category C2	[kN]	5,4	16,4	22,6
$\gamma_{Mc}$	Partial safety factor	[-]	1,5		
Tension load: displacements					
			Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
Category C2					
N	Service tension load	[kN]	9,5	14,3	17,2
$\delta_{N,eq (DLS)}$	Displacement for DLS	[mm]	3,3	3,0	5,0
$\delta_{N,eq (ULS)}$	Displacement for ULS	[mm]	12,2	11,3	16
Shear load: steel failure without lever arm					
			Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
$V_{Rk,s,eq,C1}$	Characteristic shear resistance category C1	[kN]	25,2	36,5	50,4
$V_{Rk,s,eq,C2}$	Characteristic shear resistance category C2	[kN]	19,2	29,3	39,4
$\gamma_{Mc}$	Partial safety factor	[-]	1,25		
Shear load: displacements					
			Ø 12/ M8	Ø 15/ M10	Ø 18/ M12
Category C2					
V	Service shear load	[kN]	17,1	27,5	41,5
$\delta_{V,eq (DLS)}$	Displacement for DLS	[mm]	3,1	3,9	3,9
$\delta_{V,eq (ULS)}$	Displacement for ULS	[mm]	10,2	11,8	13,0

- 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, 07/10/2017	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     nv pgb-Europe sa                      Gontrode Heirweg 170                      9090 MELLE                      BE 0425 888 396                 </div> Johannes Heye, product manager 

## Annex 1 : Product overview

SMZAV/06070 Z  
SMZAV/06085 Z  
SMZAV/06100 Z  
SMZAV/08080 Z  
SMZAV/08095 Z  
SMZAV/08120 Z

SMZAV/10100 Z  
SMZAV/10110 Z  
SMZAV/10120 Z  
SMZAV/10135 Z  
SMZAV/12115 Z  
SMZAV/12135 Z