

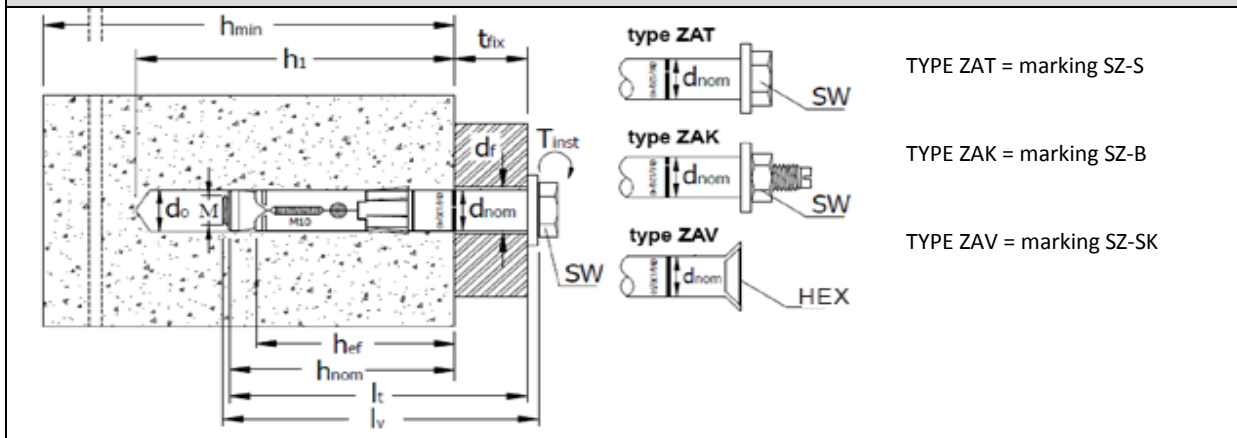
Heavy Duty Anchor SMART



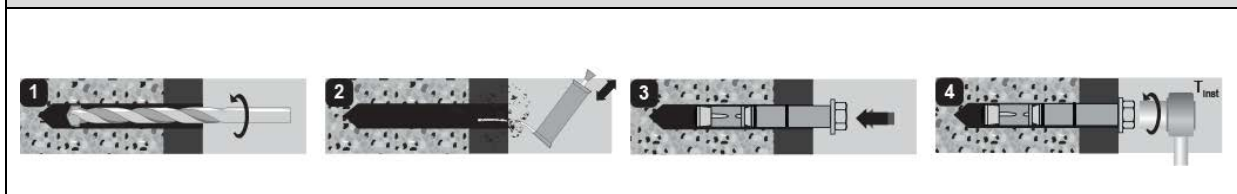
Type SMZAT

Beogd gebruik volgens ETAG 001 parts 1 - 2	
Generic type	Torque controlled metal expansion anchor for use in concrete
Base material	Cracked and non-cracked concrete C20/25 to C50/60 acc.to EN 206:2000-12
Material	Galvanized steel
Durability	internal dry conditions
Loading	static and quasi-static loads
Fire Resistance	R120
Fire reaction	A1 according to 96/603/EC amended by 2000/605/EC
Seismic action	C1 for M16 an M20, based on design method TR 045
ETA	ETA 02/0030
On the basis of	ETAG001 part 1 and 2
Attestation of conformity	0756-CPD-0006
Under system	1

Anchor types and installation parameters



Installation scheme



Performances according to ETAG 001 part 1 and part 2									
Installation parameters			Ø 10 M6	Ø 12 M8	Ø 15 M10	Ø 18 M12	Ø 24 M16	Ø 24 M16L	Ø 28 M20
d ₀	Nominal diameter of drill bit	[mm]	10	12	15	18	24	24	28
SW	Wrench size SZ-S/B	[mm]	10	13	17	19	24	24	30
HEX	Hex. Socket size SZ-SK	[mm]	4	5	6	8	-	-	-
h _{ef}	Effective anchorage depth	[mm]	50	60	71	80	100	115	125
h _{nom}	Overall embedment depth	[mm]	60	70	85	95	120	135	150
h _{min}	Min. Concrete member thickness	[mm]	100	120	140	160	200	230	250
h ₁	Drill hole depth	[mm]	65	80	95	105	130	145	160
T _{inst}	Installation torque moment SZ-S/B	[Nm]	15	30	50	80	160	160	280
T _{inst}	Installation torque moment SZ-SK	[Nm]	10	25	55	70	-	-	-
S _{min}	Min. allowable spacing ¹	[mm]	50	60	70	80	100	100	125
for c ≥			80	100	120	160	180	180	300
C _{min}	Min. allowable edge distance ¹	[mm]	60	60	70	80	100	100	180
for s ≥			100	120	175	200	220	220	540
t _{fix min}	Fixture thickness SZ-B/S	[mm]	0	0	0	0	0	0	0
t _{fix max}			200	200	200	250	300	300	300
t _{fix min} ²	Fixture thickness SZ-SK	[mm]	8	10	14	18	-	-	-
t _{fix max}			200	200	200	250	-	-	-
Steel failure to tension load									
N _{rk,s}	Characteristic resistance to tension load	[mm]	16	29	46	67	126	126	196
γ _{Ms}	Partial safety factor	[-]	1,5 ³						
Pull-out failure to tension load									
N _{rk,p,cr}	Characteristic resistance to tension load in cracked concrete	[kN]	5	12	16	25	36	44	50
N _{rk,p,ucr}	Characteristic resistance to tension load in non-cracked concrete	[kN]	18	20	30	35	50	78	72
ψ _c	Increasing factor for concrete C30/37	[-]	1,22						
ψ _c	Increasing factor for concrete C40/50	[-]	1,41						
ψ _c	Increasing factor for concrete C50/60	[-]	1,55						
Concrete cone failure and Splitting failure									
h _{ef}	Effective anchorage depth	[mm]	50	60	71	80	100	115	125
N ⁰ _{Rk,sp}	Characteristic resistance for C20/25	[kN]	12	16	25	30	40	70	50
S _{cr,N}	Critical spacing (concrete cone failure)	[mm]	150	180	213	240	300	345	375
C _{cr,N}	Critical edge distance (concrete cone failure)	[mm]	75	80	106,5	120	150	172,5	187,5
S _{cr,sp}	Critical spacing (splitting)	[mm]	150	180	213	240	300	345	375
C _{cr,sp}	Critical edge distance (splitting)	[mm]	75	80	106,5	120	150	172,5	187,5
γ _{Mp} = γ _{Msp} = γ _{Mc}	Partial safety factor	[-]	1,5						

¹ Intermediate values by linear interpolation.

² Depending on the existing shear load, the fixture thickness may be reduced to the thickness of the countersunk washer t_{sk}. It must be verified that the present shear load can be transferred completely into the distance sleeve (bearing of hole).

³ In absence of national regulations

Displacement under tension loads									
N_{cr}	Service tension load in cracked concrete C20/25	[kN]	2,4	5,7	7,6	12,3	17,1	21,1	24
$\delta_{N0,cr}$	Short term displacement under tension load in cracked concrete C20/25	[mm]	0,5	0,5	0,5	0,7	0,8	0,7	0,9
$\delta_{N\infty,cr}$	Long term displacement under tension load in cracked concrete C20/25	[mm]	2,0	2,0	1,3	1,3	1,3	1,3	1,4
N_{ucr}	Service tension load in non-cracked concrete C20/25	[kN]	8,5	9,5	14,3	17,2	24	29,6	34
$\delta_{N0,ucr}$	Short term displacement under tension load in non-cracked concrete C20/25	[mm]	0,8	1,0	1,1		1,3		0,3
$\delta_{N\infty,ucr}$	Long term displacement under tension load in non-cracked concrete C20/25	[mm]	3,4		1,7		2,3		1,4
Steel failure to shear load			$\varnothing 10$ M6	$\varnothing 12$ M8	$\varnothing 15$ M10	$\varnothing 18$ M12	$\varnothing 24$ M16	$\varnothing 24$ M16L	$\varnothing 28$ M20
$V_{rk,s}$	Steel failure without lever arm SZ-B SZ-S / SZ-SK	[kN]	16 18	25 30	36 48	63 73	91 126	91 126	122 150
$M^0_{rk,s}$	Steel failure with lever arm	[mm]	12	30	60	105	266	266	519
γ_{Ms}	Partial safety factor	[-]	1,25						
Concrete pryout failure									
k	Factor in equation 5.6 of the guideline's Annex C	[-]	1.8	2	2	2	2	2	2
γ_{Mcp}	Partial safety factor	[-]	1,5						
Concrete edge failure									
d_{nom}	Effective external diameter of the anchor	[mm]	60	+0	81	80	100	115	125
l_{ef}	Effective anchorage length	[mm]	10	12	15	18	24	24	28
γ_{Mc}	Partial safety factor	[-]	1,5						
Displacements under shear loads									
V	Service tension load in cracked and non-cracked concrete C20/25 SZ-B SZ-S / SZ-SK	[kN]	9,1 10,1	14 17,1	20,7 27,5	35,1 41,5	52,1 72	52,1 72	77 77
δ_{V0}	Short term displacement under shear load in cracked and non-cracked concrete C20/25 SZ-B SZ-S / SZ-SK	[mm]	2,5 2,9	2,1 2,5	2,7 3,6	3,0 3,5	5,1 7,0	5,1 7,0	4,3 4,3
$\delta_{V\infty}$	Long term displacement under shear load in cracked and non-cracked concrete C20/25 SZ-B SZ-S / SZ-SK	[mm]	3,8 4,4	3,1 3,8	4,1 5,4	4,5 5,3	7,6 10,5	7,6 10,5	6,5 6,5

Characteristic resistance to tension loads under fire exposure in cracked and non-cracked concrete									
$N_{rk,s,fi,30}$	Tension load - fire duration = 30 min - steel failure	[kN]	1,0	1,9	4,3	6,3	11,6	11,6	18,3
$N_{rk,p,fi,30}$	Tension load - fire duration = 30 min - pull-out failure	[kN]	1,3	3,0	4,0	6,3	8,8	8,8	15,9
$N_{rk,c,fi,30}^0$	Tension load - fire duration = 30 min - concrete cone failure	[kN]	3,1	5,0	7,6	10,3	18,0	18,0	31,4
$N_{rk,s,fi,60}$	Tension load - fire duration = 60 min - steel failure	[kN]	0,8	1,5	3,2	4,6	8,6	8,6	13,5
$N_{rk,p,fi,60}$	Tension load - fire duration = 60 min - pull-out failure	[kN]	1,3	3,0	4,0	6,3	8,8	8,8	15,9
$N_{rk,c,fi,60}^0$	Tension load - fire duration = 60 min - concrete cone failure	[kN]	3,1	5,0	7,6	10,3	18,0	18,0	31,4
$N_{rk,s,fi,90}$	Tension load - fire duration = 90 min - steel failure	[kN]	0,6	1,0	2,1	3,0	5,0	5,0	7,7
$N_{rk,p,fi,90}$	Tension load - fire duration = 90 min - pull-out failure	[kN]	1,3	3,0	4,0	6,3	8,8	8,8	15,9
$N_{rk,c,fi,90}^0$	Tension load - fire duration = 90 min - concrete cone failure	[kN]	3,1	5,0	7,6	10,3	18,0	18,0	31,4
$N_{rk,s,fi,120}$	Tension load - fire duration = 120 min - steel failure	[kN]	0,4	0,8	1,5	2,0	3,1	3,1	4,9
$N_{rk,p,fi,120}$	Tension load - fire duration = 120 min - pull-out failure	[kN]	1,0	2,4	3,2	5,0	7,0	7,0	12,7
$N_{rk,c,fi,120}^0$	Tension load - fire duration = 120 min - concrete cone failure	[kN]	2,5	4,0	6,1	8,3	14,4	14,4	25,1
Spacing and edge distance									
$S_{Cr,N,fi}$	Spacing	[mm]	4 x h_{ef}						
S_{min}	Min. spacing under fire exposure from 1 side	[mm]	50	60	70	80	100	100	125
S_{min}	Min. spacing under fire exposure from more than 1 side	[mm]	50	60	70	80	100	100	125
$C_{Cr,N,fi}$	Edge distance	[mm]	2 x h_{ef}						
C_{min}	Min. edge distance under fire exposure from 1 side	[mm]	50	60	70	80	100	100	180
C_{min}	Min. edge distance under fire exposure from more than 1 side	[mm]	$C_{min} > 300mm$						
Characteristic resistance to shear loads under fire exposure in cracked and non-cracked concrete			$\varnothing 10$ M6	$\varnothing 12$ M8	$\varnothing 15$ M10	$\varnothing 18$ M12	$\varnothing 24$ M16	$\varnothing 24$ M16L	$\varnothing 28$ M20
$V_{rk,s,fi,30}$	Shear load without lever arm - fire duration = 30 min	[kN]	1,0	1,9	4,3	6,3	11,6	11,6	18,3
$M_{rk,s,fi,30}^0$	Shear load with lever arm - fire duration = 30 min	[Nm]	0,8	2,0	5,6	9,7	24,8	24,8	42,4
$V_{rk,s,fi,60}$	Shear load without lever arm - fire duration = 60 min	[kN]	0,8	1,5	3,2	4,6	8,6	8,6	13,5
$M_{rk,s,fi,60}^0$	Shear load with lever arm - fire duration = 60 min	[Nm]	0,6	1,5	4,1	7,2	18,3	18,3	29,8
$V_{rk,s,fi,90}$	Shear load without lever arm - fire duration = 90 min	[kN]	0,6	1,0	2,1	3,0	5,0	5,0	7,7
$M_{rk,s,fi,90}^0$	Shear load with lever arm - fire duration = 90 min	[Nm]	0,4	1,0	2,7	4,7	11,9	11,9	17,1
$V_{rk,s,fi,120}$	Shear load without lever arm - fire duration = 120 min	[kN]	0,4	0,8	1,5	2,0	3,1	3,1	4,9
$M_{rk,s,fi,120}^0$	Shear load with lever arm - fire duration = 120 min	[Nm]	0,3	0,8	1,9	3,1	6,6	6,6	10,7

Concrete pryout failure		
The initial value $V_{Rk,cp,fi}$ of the characteristic resistance in concrete C20/25 to C50/60 under fire exposure may be determined by: $V_{Rk,c,fi} = k \times N_{Rk,c,fi}$ With $k=2,0$ (1,8 for M6) of ETAG 001		
Concrete edge failure		
The characteristic resistance $V_{Rk,cp,fi,ri}$ in concrete C20/25 to C50/60 is determined by: $V_{Rk,c,fi,(90)}^0 = 0,25 \times V_{Rk,c}^0$ (R30,R60,R90) and $V_{Rk,c,fi,(120)}^0 = 0,20 \times V_{Rk,c}^0$ (R120) With V_{Rk}^0 as an initial value of the characteristic resistance of a single anchor in cracked concrete C20/25		

Performances for seismic action, Category C1, design method A					
			Ø 24 M16	Ø 24 M16L	Ø 28 M20
Tension load					
Steel failure					
$N_{Rk,s,seis}^0$	Characteristic tension resistance	[kN]	126	126	196
$\gamma_{Ms,seis}$	Partial safety factor	[-]	1,5		
Pullout failure					
$N_{Rk,p,seis}^0$	Characteristic resistance in cracked concrete C20/25	[kN]	36	44	50
ψ_c	Increasing factor for $N_{Rk,p,seis}^0$	[-]	1,0		
$\gamma_{Mp,seis}$	Partial safety factor	[-]	1,5		
Shear load					
Steel failure without lever arm					
SZ-B					
$V_{Rk,s,seis}^0$	Characteristic shear resistance	[kN]	51,9	51,9	96,4
$\gamma_{Ms,seis}$	Partial safety factor	[-]	1,25		
SZ-B					
$V_{Rk,s,seis}^0$	Characteristic shear resistance	[kN]	36,3	36,3	36,3
$\gamma_{Ms,seis}$	Partial safety factor	[-]	1,25		
Steel failure with lever arm					
$M_{Rk,s,seis}^0$	Characteristic resistance	[Nm]	No performance determined		
The characteristic seismic resistance $F_{k,seis}$ of a fastening shall be determined as $F_{k,seis} = \alpha_{gap} \cdot \alpha_{seis} \cdot F_{Rk,seis}^0$ where α_{gap} reduction factor to take into account inertia effects due to an annular gap between fastener and fixture in case of shear loading. $= 1,0$ no hole clearance between fastener and fixture $= 0,5$ connections with hole clearance according to Table 1, CEN/TS 1992-4-1 or to Table 4.1, ETAG 001, Annex C α_{seis} reduction factor to take into account the influence of large cracks and scatter of load-displacement curves, see Table 39. $F_{Rk,seis}^0$ basic characteristic seismic resistance to the failure modes given in Table 19, for all other failure modes, the values for static or quasi static action may be applied. $\gamma_{Ms,seis}, \gamma_{Mp,seis}$ partial safety factor for seismic action for the failure modes given in Table 19, for all other failure modes, the values for static or quasi static action may be applied.					

De prestaties van het in de punten 1 en 2 omschreven product zijn conform de in punt 9 aangegeven prestaties. Deze prestatieverklaring wordt verstrekt onder de exclusieve verantwoordelijkheid van de in punt 4 vermelde fabrikant:

Plaats en datum van uitgave	Ondertekend voor en namens de fabrikant door	
Melle, 01/04/2014	nv pgb-Europe sa Gontrode Heirweg 170 9090 MELLE BE 0425 888 396	Johannes Heye, product manager

Annex 1 : Product overview



High-performance anchor with hexagon head screw

CARTON BOX PACKING

size	pgb code	EAN13		
6x65	SMZAT308065 Z	5902134728094	100	
6x75	SMZAT308075 Z	5902134728100	50	
6x95	SMZAT308095 Z	5902134728117	50	
6x115	SMZAT308115 Z	5902134728124	25	
8x75	SMZAT308075 Z	5902134728131	50	
8x85	SMZAT308085 Z	5902134728148	50	
8x105	SMZAT308105 Z	5902134728155	50	
8x125	SMZAT308125 Z	5902134728162	50	
10x91	SMZAT310091 Z	5902134728179	25	
10x106	SMZAT310106 Z	5902134728186	25	
10x116	SMZAT310116 Z	5902134728193	25	
10x136	SMZAT310136 Z	5902134728209	25	
10x186	SMZAT310186 Z	5902134728216	25	

CARTON BOX PACKING

size	pgb code	EAN13		
12x107	SMZAT312107 Z	5902134728223	20	
12x117	SMZAT312117 Z	5902134728230	20	
12x127	SMZAT312127 Z	5902134728247	20	
12x147	SMZAT312147 Z	5902134728254	20	
12x177	SMZAT312177 Z	5902134728261	20	
16x130	SMZAT316130 Z	5902134728278	10	
16x150	SMZAT316150 Z	5902134728285	10	
16x180	SMZAT316180 Z	5902134728292	10	
20x172	SMZAT320172 Z	5902134728308	10	
20x192	SMZAT320192 Z	5902134728315	5	
20x222	SMZAT320222 Z	5902134728322	5	
20x262	SMZAT320262 Z	5902134728339	5	