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## DECLARAÇÃO DE DESEMPENHO

DoP número: MKT-711 - pt

- ✧ **Código de identificação único do produto-tipo:** Parafuso para betão BSZ
- ✧ **Utilização(ões) prevista(s):** Âncoras mecânica para uso em concreto, ver Anexo B / Annex B
- ✧ **Fabricante:** MKT Metall-Kunststoff-Technik GmbH & Co.KG  
Auf dem Immel 2  
67685 Weilerbach
- ✧ **Sistemas de avaliação e verificação da regularidade:** 1
- ✧ **Documento de Avaliação Europeu** EAD 330232-00-0601  
Avaliação Técnica Europeia : ETA-16/0204, 19.09.2019  
Organismo de Avaliação Técnica: DIBt, Berlin  
Organismo(s) notificado (s): NB 1343 – MPA, Darmstadt

✧ **Desempenho(s) declarado(s):**

Características essenciais	Desempenho
<b>Resistência mecânica e estabilidade (BWR 1)</b>	
Resistências características sob carga de tração (efeitos estáticos e quase-estáticos)	Anexo / Annex C1
Resistências características sob tensão transversal (efeitos estáticos e quase-estáticos)	Anexo / Annex C1
Resistência característica e deslocamentos para a categoria de desempenho sísmico C1 + C2	Anexo / Annex C2, C3, C4, C7
Deslocamentos (efeitos estáticos e quase-estáticos)	Anexo / Annex C6
Durabilidade	Anexo / Annex B1
<b>Segurança contra incêndio (BWR 2)</b>	
Comportamento do fogo	Classe A1
Resistência ao fogo	Anexo / Annex C5

O desempenho do produto identificado acima está em conformidade com o conjunto de desempenhos declarados. A presente declaração de desempenho é emitida, em conformidade com o Regulamento (EU) n.º 305/2011, sob a exclusiva responsabilidade do fabricante identificado acima.

Assinado por e em nome do fabricante por:

  
Stefan Weustenhagen

(Diretor-gerente)  
Weilerbach, 19.09.2019

p.p.



Dipl.-Ing. Detlef Bigalke

(Director de Desenvolvimento de Produto)



O original desta declaração de desempenho foi escrito em alemão. Em caso de desvios na tradução, a versão alemã é válida.

## Specifications of Intended use

Concrete screw BSZ		BSZ 6		BSZ 8			BSZ 10			BSZ 12			BSZ 14		
Nominal anchorage depth $h_{nom}$ [mm]		40	55	45	55	65	55	75	85	65	85	100	75	100	115
Anchorage subject to	Static or quasi-static loading	✓		✓			✓			✓			✓		
	Fire exposure	✓		✓			✓			✓			✓		
	Seismic action C1	-		-		✓	-		✓	-		✓	-		✓
	Seismic action C2 (concrete screw BSZ, zinc plated)	-		-		✓	-		✓	-		✓	-		✓
Base material	Cracked or uncracked concrete	✓		✓			✓			✓			✓		
	Reinforced or unreinforced concrete (without fibres) acc. to EN 206:2013	✓		✓			✓			✓			✓		
	Strength classes according to EN 206:2013: C20/25 to C50/60	✓		✓			✓			✓			✓		

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (zinc plated steel, stainless steel or high corrosion resistant steel)
- Structures subject to external atmospheric exposure including industrial and marine environment or exposure to permanently damp internal condition, if no particular aggressive conditions exist (stainless steel or high corrosion resistant steel)
- Structures subject to external atmospheric exposure and to permanently damp internal condition, if other particular aggressive conditions exist (high corrosion resistant steel)

Note: Particular aggressive conditions are e.g. permanent, alternation immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used)

### Design:

- Anchorage are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.)
- Design method of anchorages under static or quasi-static load according to EN 1992-4:2018 and EOTA Technical Report TR 055.

The design method of anchorages under shear load according to EN 1992-4:2018, section 6.2.2. also applies for the specified diameter  $d_f$  of the clearance hole in the fixture in Annex B2, Table B1

### Installation:

- Making of drill hole by hammer drilling (all sizes) or vacuum drill bit (BSZ 8 – BSZ 14).  
When using a vacuum drill bit no drill hole cleaning is required.
- Anchor installation carried out by appropriately qualified personal and under the responsibility of the person responsible for technical matters on site.
- After installation further turning of the anchor is not possible. The head of the anchor is supported on the fixture and is not damaged.
- The borehole may be filled with injection mortar with a compressive strength of 40 N/mm<sup>2</sup> (e.g. MKT Injection mortar VMZ, VMH or VMU plus).
- Adjustment according to Annex B4: for concrete bolts BSZ 8 to BSZ 14, all anchorage depths for static or quasi-static loads.

## Concrete Screw BSZ

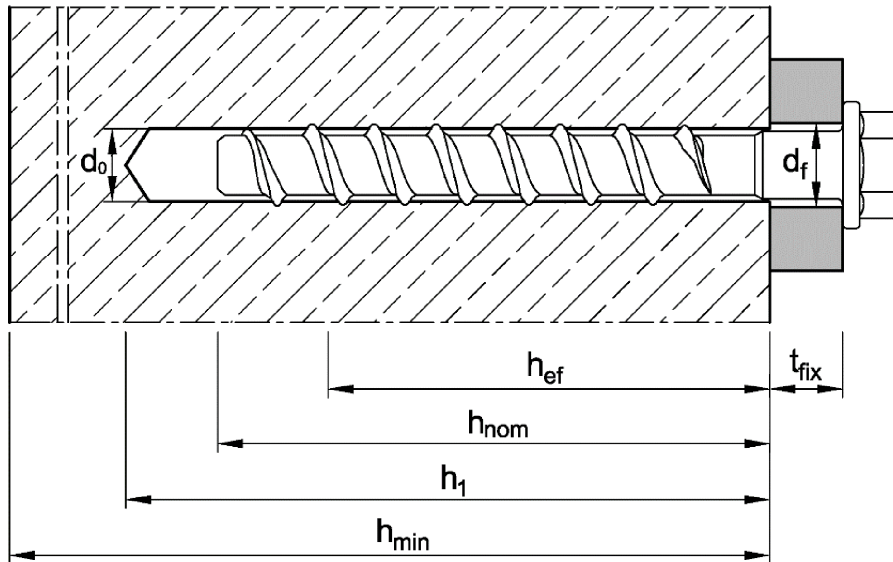
Intended use  
Specifications

Annex B1

**Table B1: Installation parameters**

Anchor size			BSZ 6		BSZ 8			BSZ 10			BSZ 12			BSZ 14		
Nominal embedment depth	$h_{nom}$	[mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115
Nominal drill bit diameter	$d_0$	[mm]	6		8			10			12			14		
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	6,40		8,45			10,45			12,50			14,50		
Effective anchorage depth	$h_{ef}$	[mm]	31	44	35	43	52	43	60	68	50	67	80	58	79	92
Depth of drill hole	$h_1 \geq$	[mm]	45	60	55	65	75	65	85	95	75	95	110	85	110	125
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	8		12			14			16			18		
Max. installation torque for screws with metric connection thread	$T_{inst} \leq$	[Nm]	10		20			40			60			80		
Tangential impact screw driver <sup>1)</sup>	$T_{imp,max}$	[Nm]	160		300			400			650			650		

<sup>1)</sup> Installation with tangential impact screw driver, with maximum power output  $T_{imp,max}$  acc. to manufacturers instructions is possible



**Table B2: Minimum thickness of member, minimum edge distance and minimum spacing**

Anchor size			BSZ 6		BSZ 8			BSZ 10			BSZ 12			BSZ 14			
Nominal embedment depth	$h_{nom}$	[mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115	
Minimum thickness of member	$h_{min}$	[mm]	100		100		120	100		130	120		130	150	130	150	170
Minimum spacing	$s_{min}$	[mm]	40		40	50		50			50		70	50		70	
Minimum edge distance	$c_{min}$	[mm]	40		40	50		50			50		70	50		70	

**Concrete Screw BSZ**

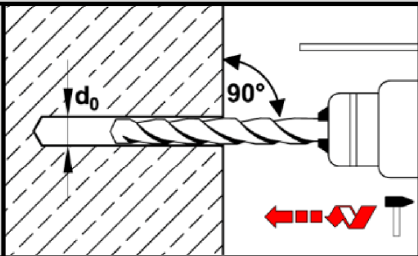
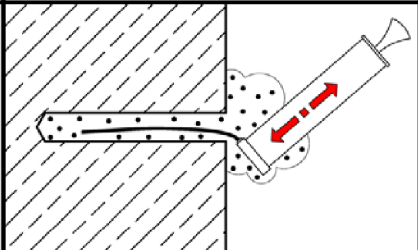
**Intended use**

Installation parameters / Minimum thickness of concrete member, minimum spacing and edge distance

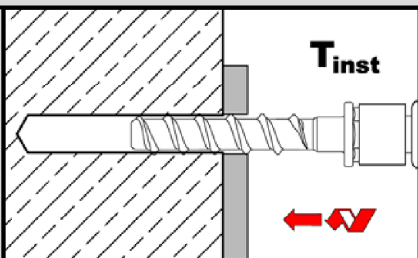
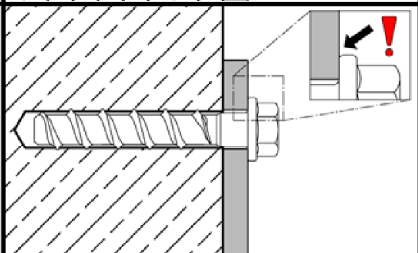
**Annex B2**

# Installation instructions

## Drill hole preparation and cleaning

1		Drill hole perpendicular to concrete surface. Using a suction drill, continue with step 3.
2		Blow out dust or alternatively vacuum clean down to the bottom of the hole.

## Installation concrete screw

3		Screw in, e.g. with tangential impact screw driver or torque wrench.
4		After installation, the head of the anchor is supported on the fixture and must be undamaged.

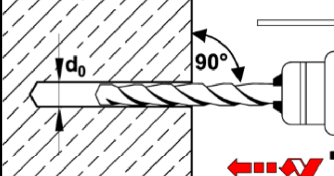
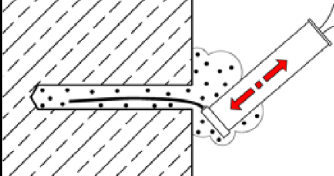
### Concrete Screw BSZ

Intended use  
Installation instructions

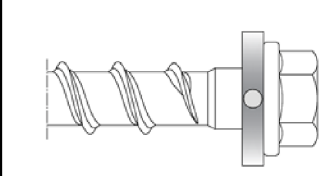
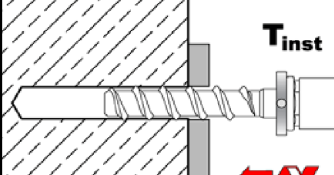
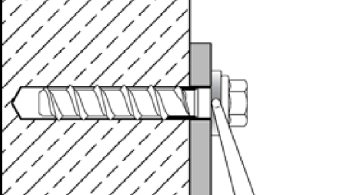
Annex B3

# Installation instructions - filling of annular gap

## Drill hole preparation and cleaning

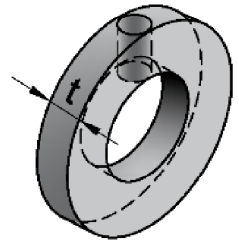
1		<p>Drill hole perpendicular to concrete surface. Using a suction drill, continue with step 3.</p>
2		<p>Blow out dust or alternatively vacuum clean down to the bottom of the hole.</p>

## Installation concrete screw with filling washer

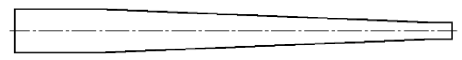
3		<p>Fit the filling washer to the concrete screw. The thickness of the filling washer must be taken into account with <math>t_{fix}</math>.</p>
4		<p>Screw in, e.g. with tangential impact screw driver or torque wrench.</p>
6		<p>Fill the annular gap between concrete screw and fixture with mortar (compressive strength <math>\geq 40 \text{ N/mm}^2</math>, e.g. Injection mortar VMH, VMZ or VMU plus). Use enclosed reducing adapter. Observe the processing information of the mortar! The annular gap is completely filled, when excess mortar seeps out.</p>

For seismic loading, the application with and without filling of annular gap is permitted (Annex C3-C4).

### Filling washer and reducing adapter for filling the annular gap between concrete screw and fixture



thickness of filling washer  
 $t = 5 \text{ mm}$



## Concrete Screw BSZ

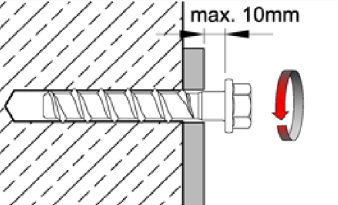
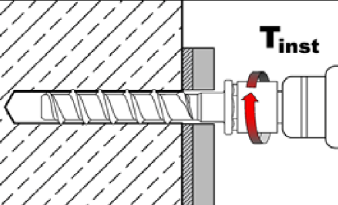
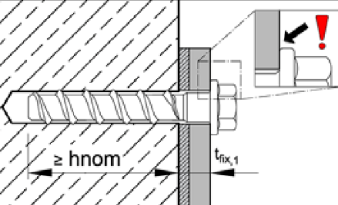
**Intended use**  
Installation instructions with filling of annular gap

**Annex B4**

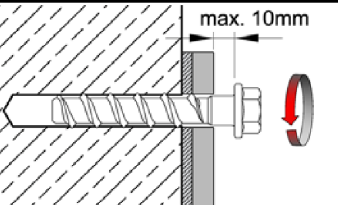
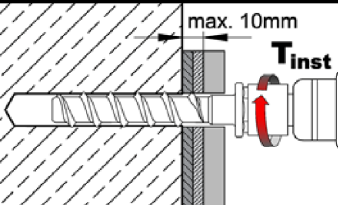
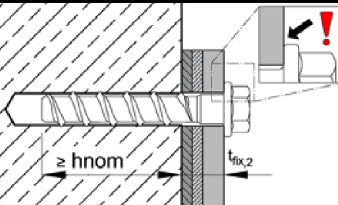
## Installation instructions - Adjustment

Drill hole preparation and cleaning see Annex B3, Picture 1 and 2

### 1. Adjustment

3		Screw may be untightened maximum 10mm.
4		After adjustment, screw in the concrete screw with with tangential impact screw driver or torque wrench.
5		After installation, the head of the anchor is supported on the fixture must be undamaged.

### 2. Adjustment

6		Screw may be untightened maximum 10mm.
7		After adjustment, screw in the concrete screw with with tangential impact screw driver or torque wrench.
8		After installation, the head of the anchor is supported on the fixture and must be undamaged.

- adjustment is only permitted for fixings with concrete screws size BSZ 8 - BSZ 14 under static or quasi-static load.
- the fastener may be adjusted max. 2x. The fastener must not be screwed back by more than 10mm in each case. The relining carried out during adjustment must not exceed 10 mm in total. Nominal embedment depth  $h_{nom}$  must still be maintained after the adjustment.

## Concrete Screw BSZ

### Intended use

Installation instructions - Adjustment

Annex B5

**Table C1: Characteristic values for static or quasi-static loads**

Anchor size		BSZ 6		BSZ 8			BSZ 10			BSZ 12			BSZ 14					
Nominal embedment depth	$h_{nom}$ [mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115			
Installation factor	$\gamma_{inst}$ [-]	1,0																
<b>Tension load</b>																		
<b>Steel failure</b>																		
Characteristic resistance	$N_{RK,s}$ [kN]	14		27			45			67			94					
Partial factor	$\gamma_{Ms,N}$ [-]	1,5																
<b>Pull-out</b>																		
Characteristic resistance in concrete C20/25	cracked	$N_{RK,p}$ [kN]	2,0	4,0	5,0	9,0	12	9,0	$\geq N_{RK,c}^0$	12	$\geq N_{RK,c}^0$		$\geq N_{RK,c}^0$					
	uncracked	$N_{RK,p}$ [kN]	4,0	9,0	7,5	12	16	12	20	26						16		
Increasing factor for $N_{RK,p}$	$\Psi_C$ [-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$																
<b>Concrete cone failure</b>																		
Effective anchorage depth	$h_{ef}$ [mm]	31	44	35	43	52	43	60	68	50	67	80	58	79	92			
Spacing	$s_{cr,N}$ [mm]	3 $h_{ef}$																
Edge distance	$c_{cr,N}$ [mm]	1,5 $h_{ef}$																
Factor $k_1$	cracked	$k_{cr,N}$ [-]	7,7															
	uncracked	$k_{ucr,N}$ [-]	11,0															
<b>Splitting</b>																		
Spacing	$s_{cr,sp}$ [mm]	120	160	120	140	150	140	180	210	150	210	240	180	240	280			
Edge distance	$c_{cr,sp}$ [mm]	60	80	60	70	75	70	90	105	75	105	120	90	120	140			
<b>Shear load</b>																		
<b>Steel failure without lever arm</b>																		
Characteristic resistance	$V_{RK,s}^0$ [kN]	7,0		13,5		17,0		22,5		34,0		33,5		42,0		56,0		
Partial factor	$\gamma_{Ms,V}$ [-]	1,25																
Ductility factor	$k_7$ [-]	0,8																
<b>Steel failure with lever arm</b>																		
Characteristic bending resistance	$M_{RK,s}^0$ [Nm]	10,9		26			56			113			185					
<b>Concrete pry-out failure</b>																		
Pry-out factor	$k_8$ [-]	1,0		1,0			1,0		2,0		1,0		2,0		1,0		2,0	
<b>Concrete edge failure</b>																		
Effective length of anchor	$l_f = h_{ef}$ [mm]	31	44	35	43	52	43	60	68	50	67	80	58	79	92			
Outside diameter of anchor	$d_{nom}$ [mm]	6		8			10			12			14					

**Concrete Screw BSZ**
**Performance**

 Characteristic values for **static** or **quasi-static** loads

**Annex C1**

**Table C2:** Characteristic resistance for **seismic loading**, performance category **C1**

Anchor size			BSZ 8	BSZ 10	BSZ 12	BSZ 14
Nominal embedment depth	$h_{nom}$	[mm]	65	85	100	115
Installation factor	$\gamma_{inst}$	[-]	1,0			
<b>Tension load</b>						
<b>Steel failure</b>						
Characteristic resistance	$N_{Rk,s,eq}$	[kN]	27	45	67	94
Partial factor	$\gamma_{Ms}$	[-]	1,5			
<b>Pull-out</b>						
Characteristic resistance	$N_{Rk,p,eq}$	[kN]	12	$\geq N_{Rk,c}^0$		
<b>Concrete cone failure</b>						
Effective anchorage depth	$h_{ef}$	[mm]	52	68	80	92
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef}$			
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$			
<b>Shear load</b>						
<b>Steel failure <u>without</u> lever arm</b>						
Characteristic resistance	$V_{Rk,s,eq}$	[kN]	8,5	15,3	21,0	22,4
Partial factor	$\gamma_{Ms}$	[-]	1,25			
<b>Concrete pry-out failure</b>						
Pry-out factor	$k_8$	[-]	1,0	2,0		
<b>Concrete edge failure</b>						
Effective length of anchor	$l_f = h_{ef}$	[mm]	52	68	80	92
Outside diameter of anchor	$d_{nom}$	[mm]	8	10	12	14
Factor for <u>with</u> filling of annular gap	$\alpha_{gap}$	[-]	1,0			
annular gap <u>without</u> filling of annular gap	$\alpha_{gap}$	[-]	0,5			

**Concrete Screw BSZ**

**Performance**

Characteristic resistance for **seismic loading**, performance category **C1**

**Annex C2**



**Table C3: Characteristic resistance for seismic loading, performance category C2, with filling of annular gap, concrete screw BSZ zinc plated**

Anchor size			BSZ 8	BSZ 10	BSZ 12	BSZ 14
Nominal embedment depth	$h_{nom}$	[mm]	65	85	100	115
Installation factor	$\gamma_{inst}$	[-]	1,0			
<b>Tension load</b>						
<b>Steel failure</b>						
Characteristic resistance	$N_{Rk,s,eq}$	[kN]	27	45	67	94
Partial factor	$\gamma_{Ms}$	[-]	1,5			
<b>Pull-out</b>						
Characteristic resistance	$N_{Rk,p,eq}$	[kN]	2,4	5,4	7,1	10,5
<b>Concrete cone failure</b>						
Effective anchorage depth	$h_{ef}$	[mm]	52	68	80	92
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef}$			
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$			
<b>Shear load</b>						
<b>Steel failure without lever arm</b>						
Characteristic resistance	$V_{Rk,s,eq}$	[kN]	9,9	18,5	31,6	40,7
Partial factor	$\gamma_{Ms}$	[-]	1,25			
<b>Concrete pry-out failure</b>						
Pry-out factor	$k_8$	[-]	2,0			
<b>Concrete edge failure</b>						
Effective length of anchor	$l_f = h_{ef}$	[mm]	52	68	80	92
Outside diameter of anchor	$d_{nom}$	[mm]	8	10	12	14
Factor for annular gap with filling of annular gap	$\alpha_{gap}$	[-]	1,0			

**Concrete Screw BSZ**

**Performance**  
 Characteristic resistance for **seismic loading**, performance category **C2**  
 with filling of annular gap

**Annex C3**

**Table C4:** Characteristic resistance for **seismic loading**, performance category **C2**, **without filling of annular gap**, concrete screw BSZ zinc plated

Anchor size			BSZ 8	BSZ 10	BSZ 12	BSZ 14	
Nominal embedment depth	$h_{nom}$	[mm]	65	85	100	115	
Installation factor	$\gamma_{inst}$	[-]	1,0				
<b>Tension loads</b>							
hexagon drive	<b>Steel failure</b>						
	Characteristic resistance	$N_{Rk,s,eq}$	[kN]	27	45	67	94
	Partial factor	$\gamma_{Ms}$	[-]	1,5			
	<b>Pull-out</b>						
	Characteristic resistance	$N_{Rk,p,eq}$	[kN]	2,4	5,4	7,1	10,5
countersunk version	<b>Steel failure</b>						
	Characteristic resistance	$N_{Rk,s,eq}$	[kN]	27	45	-	-
	Partial factor	$\gamma_{Ms}$	[-]	1,5		-	-
	<b>Pull-out</b>						
	Characteristic resistance	$N_{Rk,p,eq}$	[kN]	2,4	5,4	-	-
<b>Concrete cone failure</b>							
Effective anchorage depth	$h_{ef}$	[mm]	52	68	80	92	
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef}$				
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$				
<b>Shear loads</b>							
<b>Steel failure <u>without</u> lever arm</b>							
hexagon drive	Characteristic resistance	$V_{Rk,s,eq}$	[kN]	10,3	21,9	24,4	23,3
	Partial factor	$\gamma_{Ms}$	[-]	1,25			
counter- sunk version	Characteristic resistance	$V_{Rk,s,eq}$	[kN]	3,6	13,7	-	-
	Partial factor	$\gamma_{Ms}$	[-]	1,25		-	-
<b>Concrete pry-out failure</b>							
Pry-out factor	$k_8$	[-]	2,0				
<b>Concrete edge failure</b>							
Effective length of anchor	$l_f = h_{ef}$	[mm]	52	68	80	92	
Outside diameter of anchor	$d_{nom}$	[mm]	8	10	12	14	
Factor for annular gap <b>without</b> filling of annular gap	$\alpha_{gap}$	[-]	0,5				

**Concrete Screw BSZ**

**Performance**  
 Characteristic resistance for **seismic loading**, performance category **C2**  
without filling of annular gap

**Annex C4**

**Table C5: Characteristic values of resistance under fire exposure**

Anchor size			BSZ 6		BSZ 8			BSZ 10			BSZ 12			BSZ 14		
Nominal anchorage depth	$h_{nom}$	[mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115
<b>Steel failure (tension and shear resistance)</b>																
Characteristic resistance	R30	$N_{RK,s,fi}$ = $V_{RK,s,fi}$	[kN]	0,9		2,4		4,4		7,3		10,3				
	R60			0,8		1,7		3,3		5,8		8,2				
	R90			0,6		1,1		2,3		4,2		5,9				
	R120			0,4		0,7		1,7		3,4		4,8				
<b>Steel failure <u>with</u> lever arm</b>																
Characteristic bending resistance	R30	$M^0_{RK,s,fi}$	[Nm]	0,7		2,4		5,9		12,3		20,4				
	R60			0,6		1,8		4,5		9,7		15,9				
	R90			0,5		1,2		3,0		7,0		11,6				
	R120			0,3		0,9		2,3		5,7		9,4				
Edge distance	$c_{cr,fi}$	[mm]	$2 h_{ef}$													
In case of fire attack from more than one side, the minimum edge distance shall be $\geq 300$ mm																
Spacing	$s_{cr,fi}$	[mm]	$4 h_{ef}$													
The characteristic resistance for pull-out, concrete cone failure, concrete pry-out and concrete edge failure shall be calculated according to EN 1992-4:2018.																
The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given values																

**Concrete Screw BSZ**

**Performance**  
Characteristic values of resistance under **fire exposure**

**Annex C5**

**Table C6: Displacements under static or quasi-static loads**

Anchor size			BSZ 6		BSZ 8			BSZ 10			BSZ 12			BSZ 14		
Nominal embedment depth	$h_{nom}$	[mm]	40	55	45	55	65	55	75	85	65	85	100	75	100	115
<b>Tension load</b>																
cracked concrete	Tension load	N [kN]	0,95	1,9	2,4	4,3	5,7	4,3	7,9	9,6	5,7	9,4	12,3	7,6	12,0	15,1
	Displacement	$\delta_{N0}$ [mm]	0,3	0,6	0,6	0,7	0,8	0,6	0,5	0,9	0,9	0,5	1,0	0,5	0,8	0,7
		$\delta_{N\infty}$ [mm]	0,4	0,4	0,6	1,0	0,9	0,4	1,2	1,2	1,0	1,2	1,2	0,9	1,2	1,0
uncracked concrete	Tension load	N [kN]	1,9	4,3	3,6	5,7	7,6	5,7	9,5	11,9	7,6	13,2	17,2	10,6	16,9	21,2
	Displacement	$\delta_{N0}$ [mm]	0,4	0,6	0,7	0,9	0,5	0,7	1,1	1,0	1,0	1,1	1,2	0,9	1,2	0,8
		$\delta_{N\infty}$ [mm]	0,4	0,4	0,6	1,0	0,9	0,4	1,2	1,2	1,0	1,2	1,2	0,9	1,2	1,0
<b>Shear load</b>																
	Shear load	V [kN]	3,3		8,6			16,2			20,0			30,5		
Displacement	$\delta_{V0}$ [mm]		1,55		2,7			2,7			4,0			3,1		
	$\delta_{V\infty}$ [mm]		3,1		4,1			4,3			6,0			4,7		

**Concrete Screw BSZ**

**Performance**  
Displacements under static or quasi-static loads

**Annex C6**

**Table C7:** Displacements under **seismic loading**, performance category **C2**  
**with filling of annular gap**, concrete screw BSZ zinc plated

Anchor size			BSZ 8	BSZ 10	BSZ 12	BSZ 14
Nominal embedment depth	$h_{nom}$	[mm]	65	85	100	115
<b>Tension load</b>						
Displacement DLS	$\delta_{N,eq(DLS)}$	[mm]	0,66	0,32	0,57	1,16
Displacement ULS	$\delta_{N,eq(ULS)}$	[mm]	1,74	1,36	2,36	4,39
<b>Shear load</b>						
Displacement DLS	$\delta_{V,eq(DLS)}$	[mm]	1,68	2,91	1,88	2,42
Displacement ULS	$\delta_{V,eq(ULS)}$	[mm]	5,19	6,72	5,37	9,27

**Table C8:** Displacements under **seismic loading**, performance category **C2**  
**without filling of annular gap**, concrete screw BSZ zinc plated

Anchor size			BSZ 8	BSZ 10	BSZ 12	BSZ 14
Nominal embedment depth	$h_{nom}$	[mm]	65	85	100	115
<b>Tension load</b>						
Type with <b>hexagon drive</b>						
Displacement DLS	$\delta_{N,eq(DLS)}$	[mm]	0,66	0,32	0,57	1,16
Displacement ULS	$\delta_{N,eq(ULS)}$	[mm]	1,74	1,36	2,26	4,39
Type <b>countersunk head</b>						
Displacement DLS	$\delta_{N,eq(DLS)}$	[mm]	0,66	0,32	-	-
Displacement ULS	$\delta_{N,eq(ULS)}$	[mm]	1,74	1,36	-	-
<b>Shear load</b>						
Type <b>hexagon drive</b> and with clearance hole in the fixture						
Displacement DLS	$\delta_{V,eq(DLS)}$	[mm]	4,21	4,71	4,42	5,60
Displacement ULS	$\delta_{V,eq(ULS)}$	[mm]	7,13	8,83	6,95	12,63
Type <b>countersunk head</b> with clearance hole in the fixture						
Displacement DLS	$\delta_{V,eq(DLS)}$	[mm]	2,51	2,98	-	-
Displacement ULS	$\delta_{V,eq(ULS)}$	[mm]	7,76	6,25	-	-

**Concrete Screw BSZ**

**Performance**  
Displacements under **seismic loading**, performance category **C2**

**Annex C7**