

## DECLARAÇÃO DE DESEMPENHO

DoP N.o: MKT-721 - pt

- ✧ **Código de identificação único do produto-tipo:** Parafuso de concreto
- ✧ **Utilização(ões) prevista(s):** Parafuso de concreto como acessório múltiplo para sistemas para sistemas não estruturais em betão, ver Anexo B / Annex B
- ✧ **Fabricante:** MKT Metall-Kunststoff-Technik GmbH & Co.KG  
Auf dem Immel 2  
67685 Weilerbach
- ✧ **Sistema(s) de avaliação e verificação da regularidade do desempenho (AVCP):** 2+
- ✧ **Documento de Avaliação Europeu** **EAD 330747-00-0601**  
Avaliação Técnica Europeia : **ETA-16/0439, 07.08.2019**  
Organismo de Avaliação Técnica: **DIBt, Berlin**  
Organismo(s) notificado (s): **NB 1343 – MPA, Darmstadt**

✧ **Desempenho(s) declarado(s):**

Características essenciais	Desempenho
<b>Segurança contra incêndio (BWR2)</b>	
Comportamento do fogo	Classe A1
Resistência ao fogo	Anexo / Annex C3
<b>Segurança durante o uso (BWR 4)</b>	
Características de resistência à tensão (estática e quase-estática)	Anexo / Annex C1
Características de resistência ao corte (estática e quase-estática)	Anexo / Annex C1
Resistência característica para todas as direções de carga e todas as versões para design simplificado	Anexo / Annex C2
Durabilidade	Anexo / Annex B1

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 (UE) 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, 07.08.2019**

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 5	BSZ 6
Anchorage subject to	<b>Redundant non-structural systems</b> according to EN 1992-4:2018	✓	✓
	Static or quasi-static loads	✓	✓
	Fire exposure in solid concrete	-	✓
Base material	Cracked or uncracked concrete	✓	✓
	Compacted, reinforced or unreinforced concrete (without fibres) according to EN 206:2013	✓	✓
	Strength classes according to EN 206:2013: C20/25 to C50/60	✓	✓
	Precast pre-stressed hollow core slabs: C30/37 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:

- Anchorages 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 for anchorages acc. to EN 1992-4:2018 and EOTA Technical Report TR 055:
  - Anchorages in solid concrete: design method A
  - Anchorages in precast pre-stressed hollow core slabs: design method C
  - The design method for shear load 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 or vacuum drill bit.
- 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.

## Concrete Screw BSZ

Intended use  
Specifications

**Annex B1**

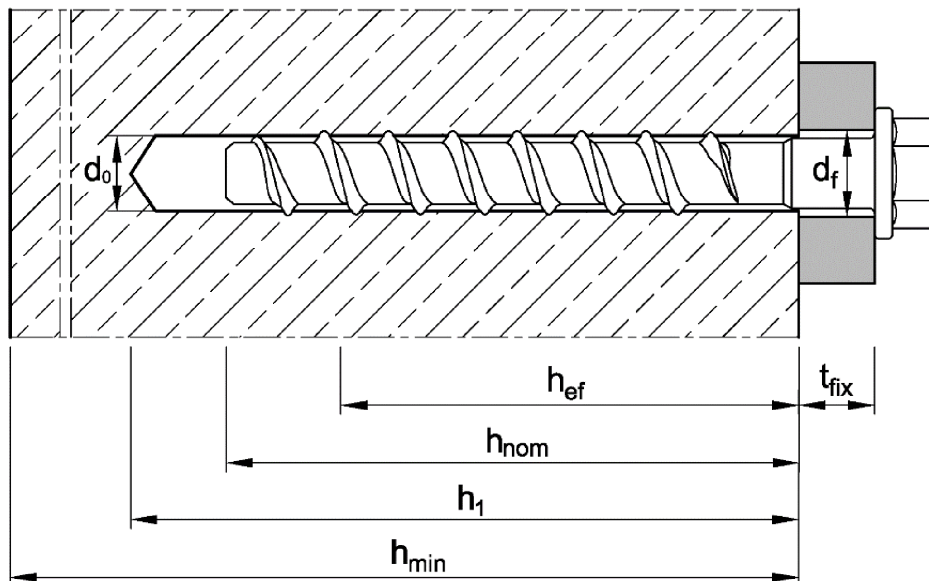
**Table B1: Installation parameters**

Anchor size			BSZ 5	BSZ 6	
Nominal embedment depth	$h_{nom}$	[mm]	35	35	55
Nominal drill bit diameter	$d_0$	[mm]	5	6	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	5,4	6,4	
Effective anchorage depth	$h_{ef}$	[mm]	27	27	44
Depth of drill hole	$h_1 \geq$	[mm]	40	40	60
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7	8	
Max. Installation torque for screws with metric connection thread	$T_{inst} \leq$	[Nm]	8	10	
Tangential impact screw driver <sup>1)</sup>	$T_{imp,max}$	[Nm]	110	160	

<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 for anchorages in solid concrete**

Anchor size			BSZ 5	BSZ 6	
Nominal embedment depth	$h_{nom}$	[mm]	35	35	55
Minimum thickness of member	$h_{min}$	[mm]	80	80	100
Minimum edge distance	$c_{min}$	[mm]	35	35	40
Minimum spacing	$s_{min}$	[mm]	35	35	40



**Concrete Screw BSZ**

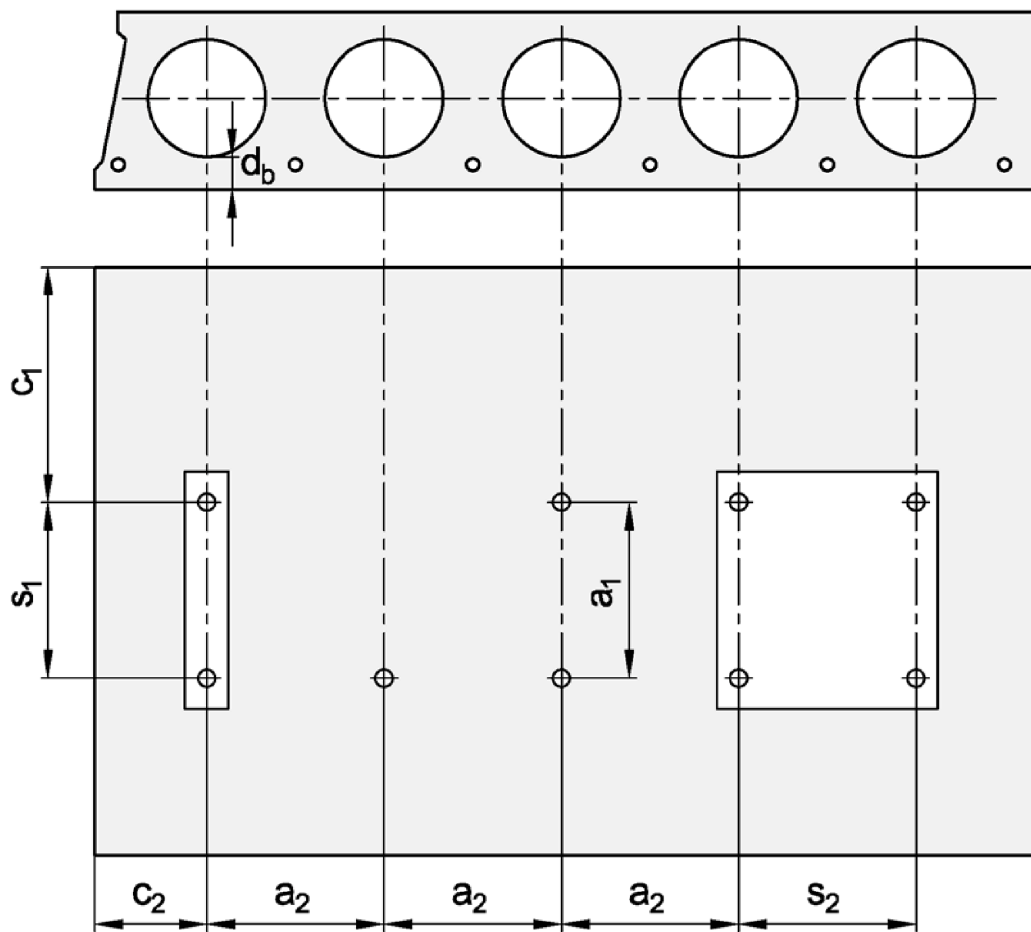
**Intended use**

Installation parameters  
 Minimum thickness of concrete member, minimum spacing and edge distance (solid concrete)

**Annex B2**

**Table B3: Minimum edge distances and minimum spacing** for anchorages in precast pre-stressed hollow core slabs

Anchor size			BSZ 6		
Flange thickness	$d_b$	[mm]	$\geq 25$	$\geq 30$	$\geq 35$
Minimum edge distance	$c_{min}$	[mm]	$\geq 100$ mm		
Minimum spacing	$s_{min}$	[mm]	$\geq 100$ mm		
Minimum distance between anchor groups	$a_{min}$	[mm]	$\geq 100$ mm		



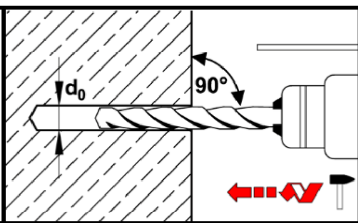
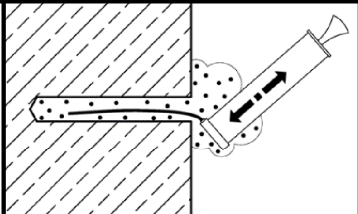
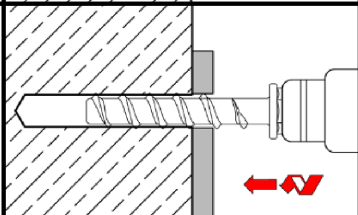
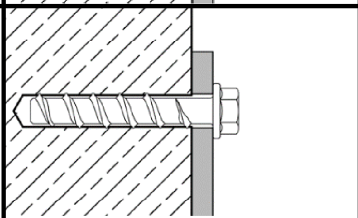
$c_1, c_2$  Edge distance  
 $s_1, s_2$  Spacing  
 $a_1, a_2$  Distance between anchor groups

**Concrete Screw BSZ**

**Intended use**  
 Installation parameters (precast pre-stressed hollow core slabs)

**Annex B3**

## Installation instructions for anchorages in solid concrete slabs

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

### Concrete Screw BSZ

**Intended use**  
Installation instructions (solid concrete)

**Annex B4**

## Installation instructions for anchorages in precast pre-stressed hollow core slabs

1		Search for position of pre-stressing steel.
2		Mark position and search for the next position of pre-stressed steel.
3		Mark second position of pre-stressed steel.
4		Drill hole taking into account the installation parameters and distances. Using a suction drill, continue with step 6.
5		Blow out dust or alternatively vacuum drill hole.
6		Screw in concrete screw, e.g. with tangential impact screw driver or torque wrench.
7		After installation, the head of the anchor is supported on the fixture and must be undamaged.

### Concrete Screw BSZ

#### Intended use

Installation instructions (precast pre-stressed hollow core slabs)

**Annex B5**

**Table C1: Characteristic values for anchorages in solid concrete**

Anchor size			BSZ 5	BSZ 6	
Nominal embedment depth	$h_{nom}$	[mm]	35	35	55
<b>Tension load</b>					
Installation factor	$\gamma_{inst}$	[-]	1,2	1,0	
<b>Steel failure</b>					
Characteristic resistance	$N_{Rk,s}$	[kN]	8,7	14,0	
Partial factor	$\gamma_{Ms,N}$	[-]	1,5	1,5	
<b>Pull-out</b>					
Characteristic resistance in cracked and uncracked concrete C20/25	$N_{Rk,p}$	[kN]	1,5	3,0	7,5
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]	27	27	44
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef}$		
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$		
Factor $k_1$ for concrete	cracked	$k_{cr,N}$	7,7		
	uncracked	$k_{ucr,N}$	11,0		
<b>Splitting</b>					
Spacing	$s_{cr,sp}$	[mm]	120	120	160
Edge distance	$c_{cr,sp}$	[mm]	60	60	80
<b>Shear load</b>					
Installation factor	$\gamma_{inst}$	[-]	1,0	1,0	
<b>Steel failure without lever arm</b>					
Characteristic resistance	$V^0_{Rk,s}$	[kN]	4,4	7,0	
Partial factor	$\gamma_{Ms,V}$	[-]	1,25	1,25	
Ductility factor	$k_7$	[-]	0,8	0,8	
<b>Steel failure with lever arm</b>					
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	5,3	10,9	
<b>Concrete pry-out failure</b>					
Pry-out factor	$k_8$	[-]	1,0	1,0	
<b>Concrete edge failure</b>					
Effective length of anchor	$l_f = h_{ef}$	[mm]	27	27	44
Outside diameter of anchor	$d_{nom}$	[mm]	5	6	

**Concrete Screw BSZ****Performance**Characteristic values for **tension and shear loads** (solid concrete)**Annex C1**

**Table C2:** Characteristic values of resistance in **precast pre-stressed hollow core slabs** C30/37 to C50/60

Anchor size			BSZ 6		
Flange thickness	$d_b$	[mm]	$\geq 25$	$\geq 30$	$\geq 35$
Characteristic resistance for all directions	$F_{Rk}$	[kN]	1	2	3
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	10,9		
Edge distance	$c_{cr} = c_{min}$	[mm]	100		
Spacing	$s_{cr} = s_{min}$	[mm]	100		
Partial factor	$\gamma_M$	[-]	1,5		
Installation factor	$\gamma_{inst}$	[-]	1,0		

**Concrete Screw BSZ**

**Performance**  
 Characteristic values of resistance in **precast pre-stressed hollow core slabs**

**Annex C2**



**Table C3:** Characteristic values of resistance under **fire exposure** for anchorages in solid concrete

Anchor size				BSZ 6			
Material				Steel, zinc plated		Stainless steel A4 / HCR	
Nominal embedment depth		$h_{nom}$	[mm]	35	55	35	55
<b>Steel failure (tension and shear resistance)</b>							
Characteristic resistance	R30	$N_{Rk,s,fi}$ = $V_{Rk,s,fi}$	[kN]	0,9		1,2	
	R60			0,8		1,2	
	R90			0,6		1,2	
	R120			0,4		0,8	
<b>Steel failure with lever arm</b>							
Characteristic bending resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	0,7		0,9	
	R60			0,6		0,9	
	R90			0,5		0,9	
	R120			0,3		0,6	
Spacing		$s_{cr,fi}$	[mm]	4 $h_{ef}$			
Edge distance		$c_{cr,fi}$	[mm]	2 $h_{ef}$			
The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given values							

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.

**Concrete Screw BSZ**

**Performance**  
Characteristic values of resistance under **fire exposure** (solid concrete)

**Annex C3**