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## PRESTATIEVERKLARING


DoP Nr.: **MKT-1.1-201\_nI**

- ◇ **Unieke identificatiecode van het producttype:** **Wedge anker B / B fvz / B A2 / B A4 / B HCR**
- ◇ **Beoogd(e) gebruik(en):** Mechanisch anker voor verankering in beton, zie bijlage / Annex B
- ◇ **Fabrikant:** MKT Metall-Kunststoff-Technik GmbH & Co.KG  
Auf dem Immel 2  
67685 Weilerbach
- ◇ **Het systeem of de systemen voor de Beoordeling en verificatie van de prestatiebestendigheid:** 1
- ◇ **Europees beoordelingsdocument:** **EAD 330232-01-0601**  
Europese technische beoordeling: **ETA-01/0013, 24.05.2022**  
Technische beoordelingsinstantie: DIBt, Berlin  
Aangemelde instantie(s): NB 2873 – Technische Universität Darmstadt
- ◇ **Aangegeven prestatie(s):**

Essentiële kenmerken	Prestaties
<b>Mechanische weerstand en stabiliteit (BWR 1)</b>	
Karakteristieke weerstand onder trekspanning (statische en quasi-statische effecten)	Bijlage/Annex B4, C1, C2
Karakteristieke weerstand onder zijwaartse spanning (statische en quasi-statische effecten)	Bijlage/Annex C3
Verschuivingen	Bijlage/Annex C4
Duurzaamheid	Bijlage / Annex B1
Karakteristieke weerstand en verplaatsingen voor seismische prestatie categorie C1 + C2	geen prestatie bepaald
<b>Brandveiligheid (BWR 2)</b>	
Brandgedrag	Klasse A1
Brandwerendheid	geen prestatie bepaald

De prestaties van het hierboven omschreven product zijn conform de aangegeven prestaties. Deze prestatieverklaring wordt in overeenstemming met Verordening (EU) nr. 305/2011 onder de exclusieve verantwoordelijkheid van de hierboven vermelde fabrikant verstrekt.

Ondertekend voor en namens de fabrikant door:

  
**Stefan Weustenhagen**

(Directeur)

**Weilerbach, 24.05.2022**

p.p.

  
**Dipl.-Ing. Detlef Bigalke**

(Hoofd productontwikkeling)



Het origineel van deze prestatieverklaring was in het Duits geschreven. In geval van afwijkingen in de vertaling is de Duitse versie geldig.

## Specifications of intended use

B / B fvz / B sh / B A2 / B A4 / B HCR		M6	M8	M10	M12	M16	M20
zinc plated steel	B (electroplated)	✓	✓	✓	✓	✓	✓
	B fvz (hot-dip galvanized)	-	✓	✓	✓	✓	✓
	B sh (sherardized)	✓	✓	✓	✓	✓	✓
stainless steel	B A2	✓	✓	✓	✓	✓	✓
	B A4	✓	✓	✓	✓	✓	✓
	B HCR	✓	✓	✓	✓	✓	✓
all versions	static or quasi-static action	✓					
	uncracked concrete	✓					

### Base materials:

- Reinforced or unreinforced normal weight concrete without fibres according to EN 206:2013 + A1:2016
- Strength classes C20/25 to C50/60 according to EN 206:2013 + A1:2016

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (all materials)
- For all other conditions:

Anchor version	Use according to EN 1993-1-4:2015 corresponding to the corrosion resistance class CRC according to Annex A, Table A2
B A2	CRC II
B A4	CRC III
B HCR	CRC V

### 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.).
- Anchorages are designed according to EN 1992-4:2018 or TR 055:2018.

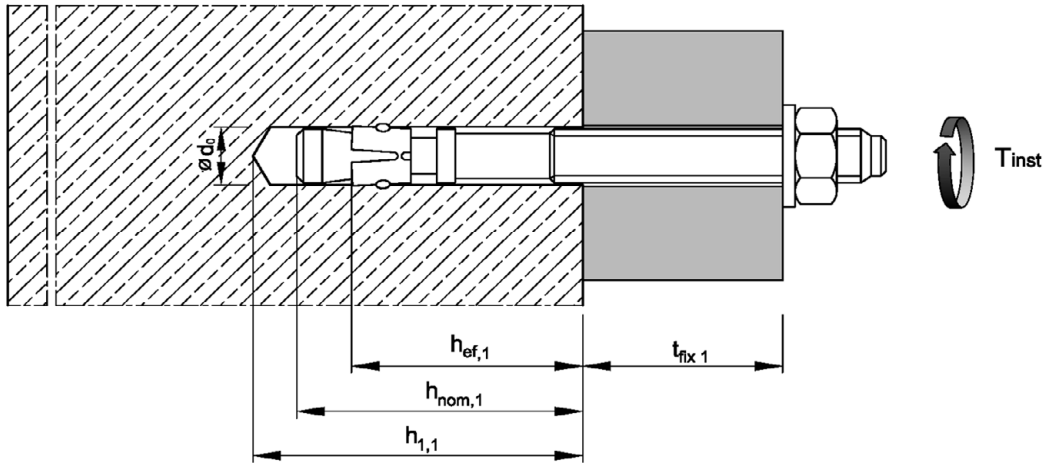
### Installation:

- Hole drilling by hammer drill bit or vacuum drill bit.
- Use of the fastener only as supplied by the manufacturer without exchanging the components of the fastener.

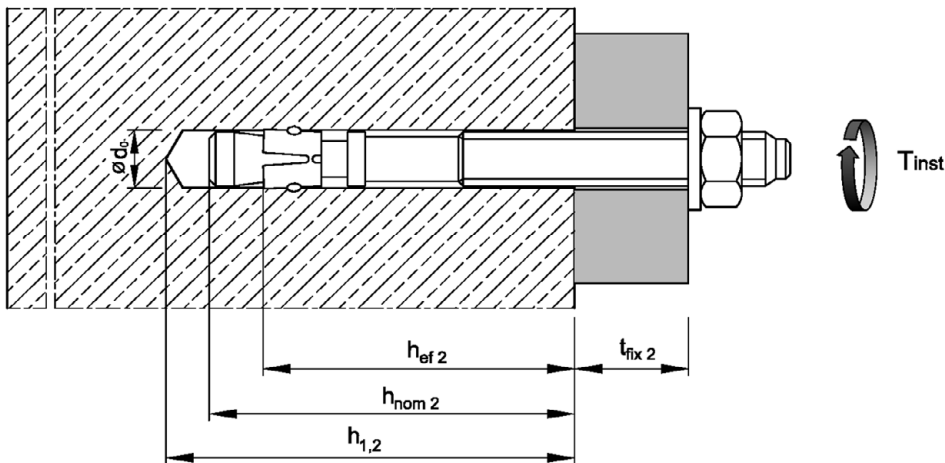
<b>Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR</b>	<b>Annex B1</b>
<b>Intended use Specifications</b>	

# Installation parameters

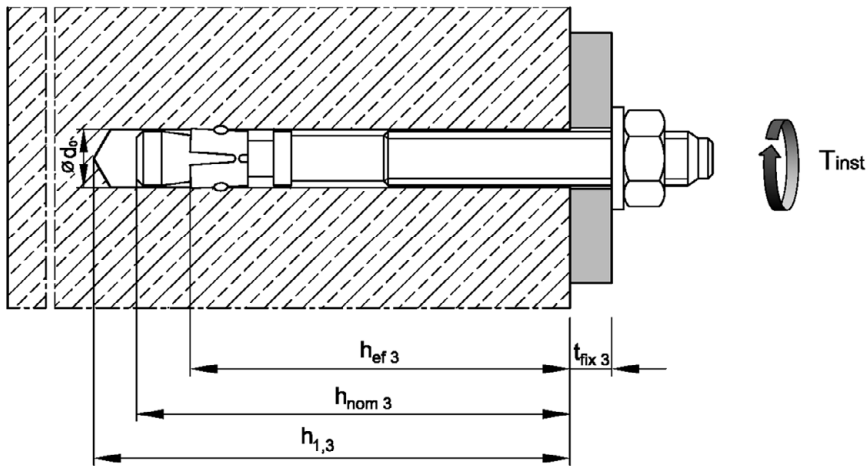
## Effective embedment depths $h_{ef,1}$



## Effective embedment depths $h_{ef,2}$



## Effective embedment depths $h_{ef,3}$



Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR

Intended use  
Specifications

Annex B2

**Table B1: Installation parameters**

Anchor size			M6	M8	M10	M12	M16	M20	
Nominal drill hole diameter	$d_0 =$	[mm]	6	8	10	12	16	20	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	6,40	8,45	10,45	12,5	16,5	20,55	
Installation torque	B	$T_{inst} =$	[Nm]	8	15	30	50	100	200
	B fvz	$T_{inst} =$	[Nm]	-	15	30	40	90	120
	B sh	$T_{inst} =$	[Nm]	5	15	30	40	90	120
	B A2 / B A4 / B HCR	$T_{inst} =$	[Nm]	6	15	25	50	100	160
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7	9	12	14	18	22	
<b>Embedment depth <math>h_{ef,1}</math></b>									
Effective embedment depth	$h_{ef,1} \geq$	[mm]	30	35	42	50	64	78	
Depth of drill hole	$h_{1,1} \geq$	[mm]	45	55	65	75	95	110	
Embedment depth	$h_{nom,1} \geq$	[mm]	39	47	56	67	84	99	
<b>Embedment depth <math>h_{ef,2}</math></b>									
Effective embedment depth	$h_{ef,2} \geq$	[mm]	40	44	48	65	82 (80) <sup>1)</sup>	100	
Depth of drill hole	$h_{1,2} \geq$	[mm]	55	65	70	90	110	130	
Embedment depth	$h_{nom,2} \geq$	[mm]	49	56	62	82	102	121	
<b>Embedment depth <math>h_{ef,3}</math></b>									
Effective embedment depth	$h_{ef,3} \geq$	[mm]	60	70	80	100	120	115	
Depth of drill hole	$h_{1,3} \geq$	[mm]	75	91	102	125	148	145	
Embedment depth	$h_{nom,3} \geq$	[mm]	69	82	94	117	140	136	

<sup>1)</sup> Anchor version B A2 / B A4 / B HCR

<b>Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR</b>	<b>Annex B3</b>
<b>Intended use</b> Installation parameters	

**Table B2: Minimum spacings and edge distances, zinc plated steel <sup>1)</sup>**

Anchor size			M6	M8	M10	M12	M16	M20
<b>Embedment depth <math>h_{ef,1}</math></b>								
Minimum member thickness	$h_{min}$	[mm]	80	80	100	100	130	160
Minimum spacing	$s_{min}$	[mm]	35	40	55	100	100	140
Minimum edge distance	$c_{min}$	[mm]	40	45	65	100	100	140
<b>Embedment depth <math>h_{ef,2}</math></b>								
Minimum member thickness	$h_{min}$	[mm]	100	100	100	130	170	200
Minimum spacing	$s_{min}$	[mm]	35	40	55	75	90	105
Minimum edge distance	$c_{min}$	[mm]	40	45	65	90	105	125
<b>Embedment depth <math>h_{ef,3}</math></b>								
Minimum member thickness	$h_{min}$	[mm]	120	126	132	165	208	215
Minimum spacing	$s_{min}$	[mm]	35	40	55	75	90	105
Minimum edge distance	$c_{min}$	[mm]	40	45	65	90	105	125

<sup>1)</sup> Anchor version B fvz: M8-M20

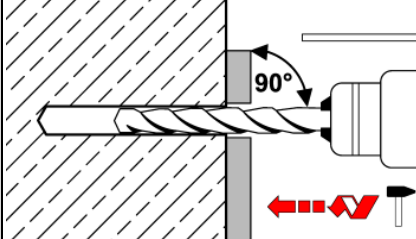
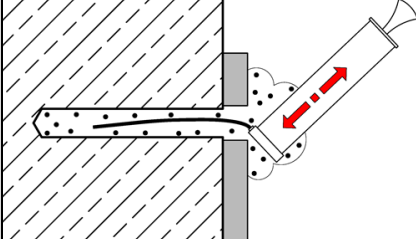
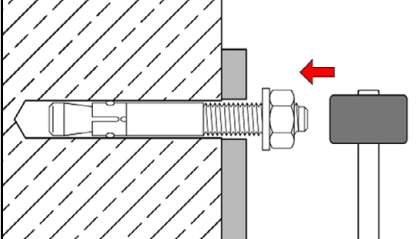
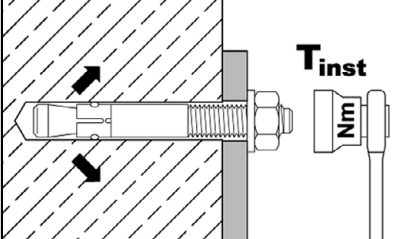
**Table B3: Minimum spacings and edge distances, stainless steel**

Anchor size			M6	M8	M10	M12	M16	M20
<b>Embedment depth <math>h_{ef,1}</math></b>								
Minimum member thickness	$h_{min}$	[mm]	80	80	100	100	130	160
Minimum spacing	$s_{min}$	[mm]	35	60	55	100	110	140
Minimum edge distance	$c_{min}$	[mm]	40	60	65	100	110	140
<b>Embedment depth <math>h_{ef,2}</math></b>								
Minimum member thickness	$h_{min}$	[mm]	100	100	100	130	160	200
Minimum spacing	$s_{min}$	[mm]	35	35	45	60	80	100
	for $c \geq$	[mm]	40	65	70	100	120	150
Minimum edge distance	$c_{min}$	[mm]	35	45	55	70	80	100
	for $s \geq$	[mm]	60	110	80	100	140	180
<b>Embedment depth <math>h_{ef,3}</math></b>								
Minimum member thickness	$h_{min}$	[mm]	120	126	132	165	200	215
Minimum spacing	$s_{min}$	[mm]	35	35	45	60	80	100
	for $c \geq$	[mm]	40	65	70	100	120	150
Minimum edge distance	$c_{min}$	[mm]	35	45	55	70	80	100
	for $s \geq$	[mm]	60	110	80	100	140	180

Intermediate values by linear interpolation.

<b>Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR</b>	<b>Annex B4</b>
<b>Intended use</b> Minimum spacings and edge distances	

## Installation instructions

1		<p>Drill hole perpendicular to concrete surface. If using a vacuum drill bit, proceed with step 3.</p>
2		<p>Blow out dust. Alternatively, vacuum clean down to the bottom of the hole.</p>
3		<p>Drive in anchor, such that the selected embedment depth is met.</p>
4		<p>Apply installation torque <math>T_{inst}</math> as specified in Table B1.</p>

Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR

Intended use  
Installation instructions

Annex B5

**Table C1: Characteristic values for tension loads, zinc plated steel <sup>1)</sup>**

Anchor size			M6	M8	M10	M12	M16	M20	
Installation factor	$\gamma_{inst}$	[-]	1,0						
<b>Steel failure</b>									
Characteristic resistance	$N_{Rk,s}$	[kN]	8,7	15,3	26	35	65	107	
Partial factor <sup>4)</sup>	$\gamma_{Ms}$	[-]	1,5				1,6		
<b>Pull-out</b>									
Characteristic resistance in uncracked concrete C20/25	for $h_{ef,1}$	$N_{Rk,p}$	[kN]	6,5 <sup>2)</sup>	10,2 <sup>2)</sup>	13,4	17,4	25,2	33,9
	for $h_{ef,2}$	$N_{Rk,p}$	[kN]	10	13	16,4	25,8	36,5	49,2
	for $h_{ef,3}$	$N_{Rk,p}$	[kN]	10	13	16,4	26	40	55
Increasing factor $N_{Rk,p} = \psi_C \cdot N_{Rk,p} (C20/25)$	$\psi_C$	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$				$\left(\frac{f_{ck}}{20}\right)^{0,33}$	$\left(\frac{f_{ck}}{20}\right)^{0,5}$	
<b>Splitting</b>									
Characteristic resistance	$N^0_{Rk,sp}$	[kN]	min [ $N_{Rk,p}$ ; $N^0_{Rk,c}$ <sup>3)</sup> ]						
<b>Embedment depth <math>h_{ef,1}</math></b>									
Spacing	$s_{cr,sp}$	[mm]	180	210	230	240	320	400	
Edge distance	$c_{cr,sp}$	[mm]	90	105	115	120	160	200	
<b>Embedment depth <math>h_{ef,2}</math></b>									
Spacing	$s_{cr,sp}$	[mm]	160	220	240	330	410	500	
Edge distance	$c_{cr,sp}$	[mm]	80	110	120	165	205	250	
<b>Embedment depth <math>h_{ef,3}</math></b>									
Spacing	$s_{cr,sp}$	[mm]	160	220	240	330	410	520	
Edge distance	$c_{cr,sp}$	[mm]	80	110	120	165	205	260	
<b>Concrete cone failure</b>									
Effective embedment depth	for $h_{ef,1}$	[mm]	30 <sup>2)</sup>	35 <sup>2)</sup>	42	50	64	78	
	for $h_{ef,2}$	[mm]	40	44	48	65	82	100	
	for $h_{ef,3}$	[mm]	60	70	80	100	120	115	
Spacing	$s_{cr,N}$	[mm]	3 $h_{ef(1,2,3)}$						
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef(1,2,3)}$						
Factor	uncracked concrete	$k_{ucr,N}$	[-]	11,0					
	cracked concrete	$k_{cr,N}$	[-]	No performance assessed					

<sup>1)</sup> Anchor version B fvz: M8-M20

<sup>2)</sup> Restricted to the use of structural components with  $h_{ef} < 40$ mm which are statically indeterminate and subject to internal exposure conditions only

<sup>3)</sup>  $N^0_{Rk,c}$  according to EN 1992-4:2018

<sup>4)</sup> In absence of other national regulations

**Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR**

**Performance**  
Characteristic values for **tension loads, zinc plated steel**

**Annex C1**

**Table C2: Characteristic values for tension loads, stainless steel**

Anchor size				M6	M8	M10	M12	M16	M20	
Installation factor	$\gamma_{inst}$	[-]	1,0							
<b>Steel failure</b>										
Characteristic resistance	$N_{Rk,s}$	[kN]	10	18	30	44	88	134		
Partial factor <sup>3)</sup>	$\gamma_{Ms}$	[-]	1,50						1,68	
<b>Pull-out</b>										
Characteristic resistance in uncracked concrete C20/25	for $h_{ef,1}$	$N_{Rk,p}$	[kN]	6,5 <sup>1)</sup>	9 <sup>1)</sup>	12	17,4	25,2	33,9	
	for $h_{ef,2}$	$N_{Rk,p}$	[kN]	8	15	16,4	25	35,2	49,2	
	for $h_{ef,3}$	$N_{Rk,p}$	[kN]	8	15	16,4	25	42	60	
Increasing factor $N_{Rk,p} = \psi_C \cdot N_{Rk,p} (C20/25)$	$\psi_C$	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$							
<b>Splitting</b>										
Characteristic resistance	$N^0_{Rk,sp}$	[kN]	min [ $N_{Rk,p}$ ; $N^0_{Rk,c}^{2)}$ ]							
<b>Embedment depth <math>h_{ef,1}</math></b>										
Spacing	$S_{cr,sp}$	[mm]	180	210	230	300	320	400		
Edge distance	$C_{cr,sp}$	[mm]	90	105	115	150	160	200		
<b>Embedment depth <math>h_{ef,2}</math></b>										
The higher one of the decisive resistances of Case 1 and Case 2 is applicable										
Case 1	Characteristic resistance	$N^0_{Rk,sp}$	[kN]	6	9	12	20	30	40	
	Spacing	$S_{cr,sp}$	[mm]	3 $h_{ef}$						
	Edge distance	$C_{cr,sp}$	[mm]	1,5 $h_{ef}$						
	Increasing factor $N^0_{Rk,sp} = \psi_C \cdot N^0_{Rk,sp} (C20/25)$	$\psi_C$	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$						
Case 2	Spacing	$S_{cr,sp}$	[mm]	160	220	240	340	410	560	
	Edge distance	$C_{cr,sp}$	[mm]	80	110	120	170	205	280	
<b>Embedment depth <math>h_{ef,3}</math></b>										
Spacing	$S_{cr,sp}$	[mm]	160	220	240	340	410	620		
Edge distance	$C_{cr,sp}$	[mm]	80	110	120	170	205	310		
<b>Concrete cone failure</b>										
Effective embedment depth	for $h_{ef,1} \geq$	[mm]	30 <sup>1)</sup>	35 <sup>1)</sup>	42	50	64	78		
	for $h_{ef,2} \geq$	[mm]	40	44	48	65	80	100		
	for $h_{ef,3} \geq$	[mm]	60	70	80	100	120	115		
Spacing	$S_{cr,N}$	[mm]	3 $h_{ef}$							
Edge distance	$C_{cr,N}$	[mm]	1,5 $h_{ef}$							
Factor	uncracked concrete	$k_{ucr,N}$	[-]	11,0						
	cracked concrete	$k_{cr,N}$	[-]	No performance assessed						

<sup>1)</sup> Restricted to the use of structural components with  $h_{ef} < 40\text{mm}$  which are statically indeterminate and subject to internal exposure conditions only

<sup>2)</sup>  $N^0_{Rk,c}$  according to EN 1992-4:2018

<sup>3)</sup> In absence of other national regulations

**Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR**

**Performance**  
Characteristic values for **tension loads, stainless steel**

**Annex C2**



**Table C3: Characteristic values for shear loads**

Anchor size				M6	M8	M10	M12	M16	M20
Installation factor		$\gamma_{inst}$	[-]	1,0					
<b>Steel failure without lever arm</b>									
Characteristic resistance	zinc plated steel <sup>1)</sup>	$V_{Rk,s}^0$	[kN]	5	11	17	25	44	69
	stainless steel	$V_{Rk,s}^0$	[kN]	7	12	19	27	50	86
Ductility factor		$k_7$	[-]	1,0					
<b>Steel failure with lever arm</b>									
Characteristic bending resistance	zinc plated steel <sup>1)</sup>	$M_{Rk,s}^0$	[Nm]	9	23	45	78	186	363
	stainless steel	$M_{Rk,s}^0$	[Nm]	10	24	49	85	199	454
Partial factor <sup>4)</sup> for $V_{Rk,s}^0$ and $M_{Rk,s}^0$	zinc plated steel <sup>1)</sup>	$\gamma_{Ms}$	[-]	1,25				1,33	
	stainless steel	$\gamma_{Ms}$	[-]	1,25					1,4
<b>Concrete pry-out failure</b>									
Factor for $h_{ef}$	zinc plated steel <sup>1)</sup>	$k_8$	[-]	1,0	2,3	2,5	2,9	2,8	3,1
	stainless steel	$k_8$	[-]	1,0	2,3	2,8	2,8	3,0	3,3
<b>Concrete edge failure</b>									
Effective length of anchor in shear loading	for $h_{ef,1}$	$l_f$	[mm]	30 <sup>2)</sup>	35 <sup>2)</sup>	42	50	64	78
	for $h_{ef,2}$	$l_f$	[mm]	40	44	48	65	82 (80) <sup>3)</sup>	100
	for $h_{ef,3}$	$l_f$	[mm]	60	70	80	100	120	115
Outside diameter of anchor		$d_{nom}$	[mm]	6	8	10	12	16	20

<sup>1)</sup> Anchor version B fvz: M8-M20

<sup>2)</sup> Restricted to the use of structural components which are statically indeterminate and subject to internal exposure conditions only

<sup>3)</sup> Anchor version stainless steel

<sup>4)</sup> In absence of other national regulations

**Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR**

**Performance**  
Characteristic values for **shear loads**

**Annex C3**

**Table C4: Displacements under tension load**

Anchor size			M6	M8	M10	M12	M16	M20
<b>Embedment depth <math>h_{ef,1}</math></b>								
<b>zinc plated steel <sup>1)</sup></b>								
Tension load	N	[kN]	2,9	5,0	6,5	8,5	12,3	16,6
Displacement	$\delta_{N0}$	[mm]	0,3	0,4				
	$\delta_{N\infty}$	[mm]	0,6	1,8				
<b>stainless steel</b>								
Tension load	N	[kN]	2,9	4,3	5,7	8,5	12,3	16,6
Displacement	$\delta_{N0}$	[mm]	0,4	0,7	0,4	0,4	0,6	1,5
	$\delta_{N\infty}$	[mm]	1,3					2,9
<b>Embedment depth <math>h_{ef,2}</math> and <math>h_{ef,3}</math></b>								
<b>zinc plated steel <sup>1)</sup></b>								
Tension load	N	[kN]	4,3	5,8	7,6	11,9	16,7	23,8
Displacement	$\delta_{N0}$	[mm]	0,4	0,5				
	$\delta_{N\infty}$	[mm]	0,7	2,3				
<b>stainless steel</b>								
Tension load	N	[kN]	3,6	5,7	7,6	11,9	17,2	24,0
Displacement	$\delta_{N0}$	[mm]	0,7	0,9	0,5	0,6	0,9	2,1
	$\delta_{N\infty}$	[mm]	1,8					4,2

<sup>1)</sup> Anchor version B fvz: M8-M20

**Table C5: Displacements under shear loads**

Anchor size			M6	M8	M10	M12	M16	M20
<b>zinc plated steel <sup>1)</sup></b>								
Shear load	V	[kN]	2,9	6,3	9,7	14,3	23,6	37,0
Displacement	$\delta_{V0}$	[mm]	1,2	1,5	1,6	2,6	3,1	4,4
	$\delta_{V\infty}$	[mm]	2,4	2,2	2,4	3,9	4,6	6,6
<b>stainless steel</b>								
Shear load	V	[kN]	4,0	6,9	10,9	15,4	28,6	43,7
Displacement	$\delta_{V0}$	[mm]	1,1	2,0	1,2	2,0	2,2	2,1
	$\delta_{V\infty}$	[mm]	1,7	3,0	1,8	3,0	3,3	3,2

<sup>1)</sup> Anchor version B fvz: M8-M20

**Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR**

**Performance**  
Displacements

**Annex C4**