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DEKLARACJA WŁAŚCIWOŚCI UŻYTKOWYCH

DoP Nr: .: **MKT-1.1-201_pl**

- ✧ **Niepowtarzalny kod identyfikacyjny typu wyrobu:** **Wedge kotwica B / B fvz / B A2 / B A4 / B HCR**
- ✧ **Zamierzone zastosowanie lub zastosowania:** Kotwa mechaniczna do kotwienia w betonie, patrz załącznik B /Annex B
- ✧ **Producent:** MKT Metall-Kunststoff-Technik GmbH & Co.KG
Auf dem Immel 2
67685 Weilerbach
- ✧ **System(-y) oceny i weryfikacji stałości właściwości użytkowych:** 1
- ✧ **Europejski dokument oceny:** **EAD 330232-01-0601**
Europejska ocena techniczna: **ETA-01/0013, 24.05.2022**
Jednostka ds. oceny technicznej: DIBt, Berlin
Jednostka lub jednostki notyfikowane: NB 2873 – Technische Universität Darmstadt

✧ **Deklarowane właściwości użytkowe:**

Zasadnicze charakterystyki	Właściwości użytkowe
Nośność i stateczność (BWR 1)	
Charakterystyczny opór przy naprężeniu rozciągającym (efekty statyczne i quasi-statyczne)	Załącznik/Annex B4, C1, C2
Charakterystyczny opór przy naprężeniu bocznym (efekty statyczne i quasi-statyczne)	Załącznik/Annex C3
Przesunięcia	Załącznik/Annex C4
Trwałość	Załącznik / Annex B1
Charakterystyka rezystancji i przemieszczeń dla kategorii C1+C2 dla badań sejsmicznych	właściwości użytkowe nieustalone
Bezpieczeństwo pożarowe (BWR 2)	
Zachowanie ogień	Klasa A1
Odporność ogniowa	właściwości użytkowe nieustalone

Właściwości użytkowe określonego powyżej wyrobu są zgodne z zestawem deklarowanych właściwości użytkowych. Niniejsza deklaracja właściwości użytkowych wydana zostaje zgodnie z rozporządzeniem (UE) nr 305/2011 na wyłączną odpowiedzialność producenta określonego powyżej.

W imieniu producenta podpisał(-a):

Stefan Weustenhagen

(Kierownik)

Weilerbach, 24.05.2022

p.p.
Dipl.-Ing. Detlef Bigalke
(Kierownik Rozwoju Produktu)



Oryginał tej deklaracji właściwości użytkowych został sporządzony w języku niemieckim. W przypadku odchyień w tłumaczeniu obowiązuje wersja niemiecka.

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.

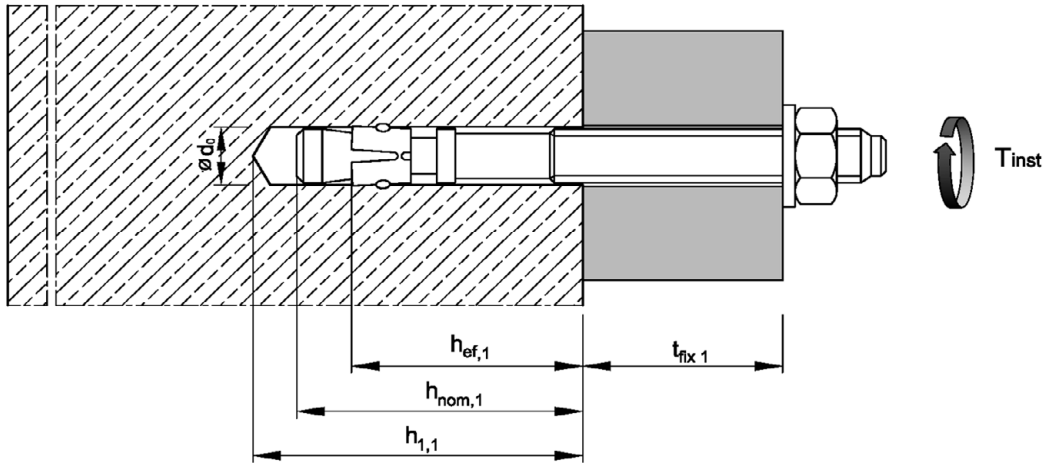
Installation:

- 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.

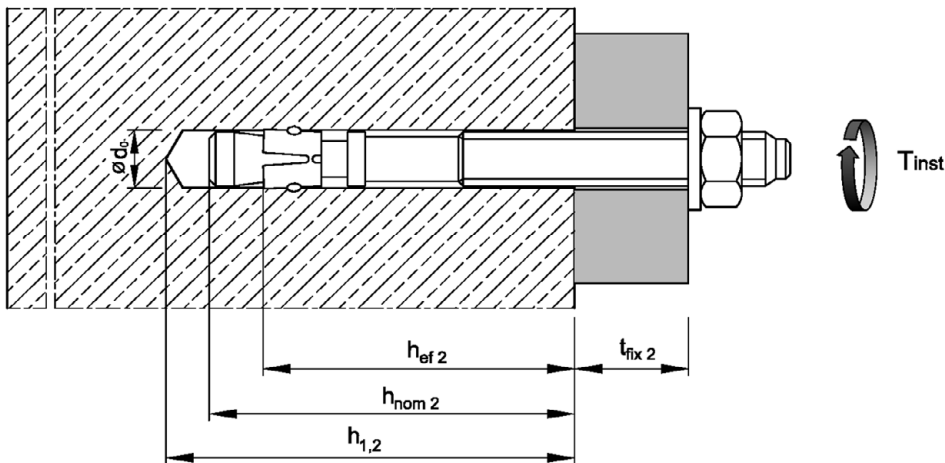
Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR	Annex B1
Intended use Specifications	

Installation parameters

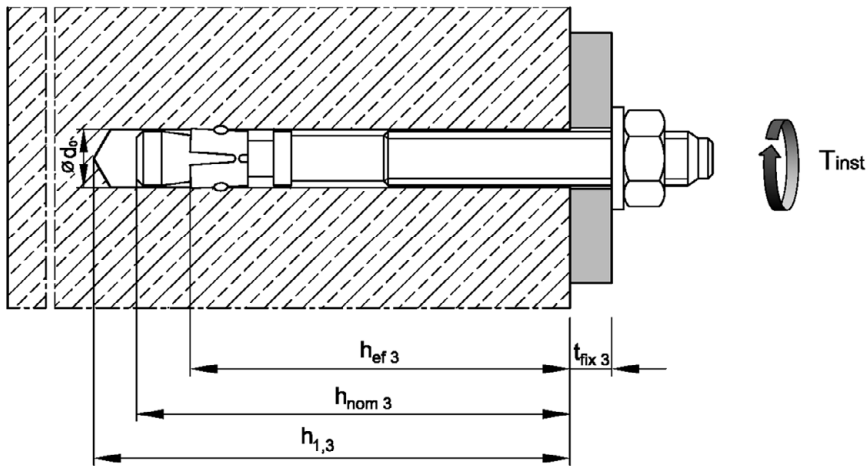
Effective embedment depths $h_{ef,1}$



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	
Embedment depth $h_{ef,1}$									
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	
Embedment depth $h_{ef,2}$									
Effective embedment depth	$h_{ef,2} \geq$	[mm]	40	44	48	65	82 (80) ¹⁾	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	
Embedment depth $h_{ef,3}$									
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	

¹⁾ Anchor version B A2 / B A4 / B HCR

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

Table B2: Minimum spacings and edge distances, zinc plated steel ¹⁾

Anchor size			M6	M8	M10	M12	M16	M20
Embedment depth $h_{ef,1}$								
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
Embedment depth $h_{ef,2}$								
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
Embedment depth $h_{ef,3}$								
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

¹⁾ Anchor version B fvz: M8-M20

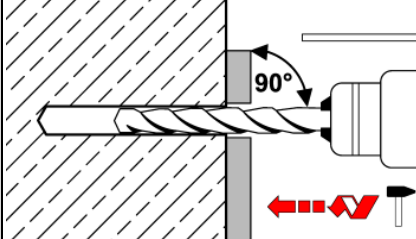
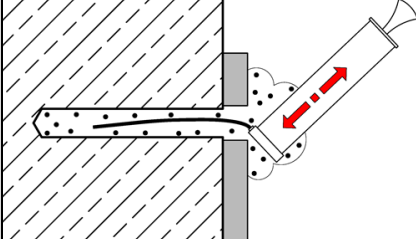
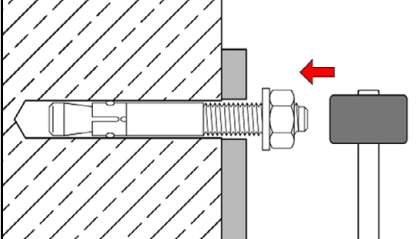
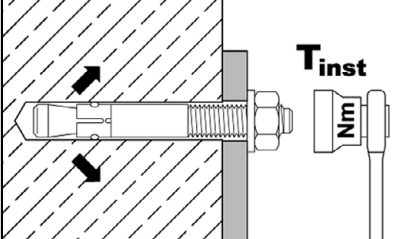
Table B3: Minimum spacings and edge distances, stainless steel

Anchor size			M6	M8	M10	M12	M16	M20
Embedment depth $h_{ef,1}$								
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
Embedment depth $h_{ef,2}$								
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
Embedment depth $h_{ef,3}$								
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.

Wedge Anchor B / B fvz / B sh / B A2 / B A4 / B HCR	Annex B4
Intended use 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 T_{inst} 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 ¹⁾

Anchor size			M6	M8	M10	M12	M16	M20	
Installation factor	γ_{inst}	[-]	1,0						
Steel failure									
Characteristic resistance	$N_{Rk,s}$	[kN]	8,7	15,3	26	35	65	107	
Partial factor ⁴⁾	γ_{Ms}	[-]	1,5				1,6		
Pull-out									
Characteristic resistance in uncracked concrete C20/25	for $h_{ef,1}$	$N_{Rk,p}$	[kN]	6,5 ²⁾	10,2 ²⁾	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 $N_{Rk,p} = \psi_C \cdot N_{Rk,p} (C20/25)$	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$				$\left(\frac{f_{ck}}{20}\right)^{0,33}$	$\left(\frac{f_{ck}}{20}\right)^{0,5}$	
Splitting									
Characteristic resistance	$N^0_{Rk,sp}$	[kN]	min [$N_{Rk,p}$; $N^0_{Rk,c}$ ³⁾]						
Embedment depth $h_{ef,1}$									
Spacing	$s_{cr,sp}$	[mm]	180	210	230	240	320	400	
Edge distance	$c_{cr,sp}$	[mm]	90	105	115	120	160	200	
Embedment depth $h_{ef,2}$									
Spacing	$s_{cr,sp}$	[mm]	160	220	240	330	410	500	
Edge distance	$c_{cr,sp}$	[mm]	80	110	120	165	205	250	
Embedment depth $h_{ef,3}$									
Spacing	$s_{cr,sp}$	[mm]	160	220	240	330	410	520	
Edge distance	$c_{cr,sp}$	[mm]	80	110	120	165	205	260	
Concrete cone failure									
Effective embedment depth	for $h_{ef,1}$	[mm]	30 ²⁾	35 ²⁾	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					

¹⁾ Anchor version B fvz: M8-M20

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

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

⁴⁾ 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	γ_{inst}	[-]	1,0							
Steel failure										
Characteristic resistance	$N_{Rk,s}$	[kN]	10	18	30	44	88	134		
Partial factor ³⁾	γ_{Ms}	[-]	1,50						1,68	
Pull-out										
Characteristic resistance in uncracked concrete C20/25	for $h_{ef,1}$	$N_{Rk,p}$	[kN]	6,5 ¹⁾	9 ¹⁾	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 $N_{Rk,p} = \psi_C \cdot N_{Rk,p} (C20/25)$	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$							
Splitting										
Characteristic resistance	$N^0_{Rk,sp}$	[kN]	min [$N_{Rk,p}$; $N^0_{Rk,c}{}^{2)}$]							
Embedment depth $h_{ef,1}$										
Spacing	$S_{cr,sp}$	[mm]	180	210	230	300	320	400		
Edge distance	$C_{cr,sp}$	[mm]	90	105	115	150	160	200		
Embedment depth $h_{ef,2}$										
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 $N^0_{Rk,sp} = \psi_C \cdot N^0_{Rk,sp} (C20/25)$	ψ_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	
Embedment depth $h_{ef,3}$										
Spacing	$S_{cr,sp}$	[mm]	160	220	240	340	410	620		
Edge distance	$C_{cr,sp}$	[mm]	80	110	120	170	205	310		
Concrete cone failure										
Effective embedment depth	for $h_{ef,1} \geq$	[mm]	30 ¹⁾	35 ¹⁾	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						

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

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

³⁾ 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		γ_{inst}	[-]	1,0					
Steel failure without lever arm									
Characteristic resistance	zinc plated steel ¹⁾	$V_{Rk,s}^0$	[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					
Steel failure with lever arm									
Characteristic bending resistance	zinc plated steel ¹⁾	$M_{Rk,s}^0$	[Nm]	9	23	45	78	186	363
	stainless steel	$M_{Rk,s}^0$	[Nm]	10	24	49	85	199	454
Partial factor ⁴⁾ for $V_{Rk,s}^0$ and $M_{Rk,s}^0$	zinc plated steel ¹⁾	γ_{Ms}	[-]	1,25				1,33	
	stainless steel	γ_{Ms}	[-]	1,25					1,4
Concrete pry-out failure									
Factor for h_{ef}	zinc plated steel ¹⁾	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
Concrete edge failure									
Effective length of anchor in shear loading	for $h_{ef,1}$	l_f	[mm]	30 ²⁾	35 ²⁾	42	50	64	78
	for $h_{ef,2}$	l_f	[mm]	40	44	48	65	82 (80) ³⁾	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

¹⁾ Anchor version B fvz: M8-M20

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

³⁾ Anchor version stainless steel

⁴⁾ 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
Embedment depth $h_{ef,1}$								
zinc plated steel ¹⁾								
Tension load	N	[kN]	2,9	5,0	6,5	8,5	12,3	16,6
Displacement	δ_{N0}	[mm]	0,3	0,4				
	$\delta_{N\infty}$	[mm]	0,6	1,8				
stainless steel								
Tension load	N	[kN]	2,9	4,3	5,7	8,5	12,3	16,6
Displacement	δ_{N0}	[mm]	0,4	0,7	0,4	0,4	0,6	1,5
	$\delta_{N\infty}$	[mm]	1,3					2,9
Embedment depth $h_{ef,2}$ and $h_{ef,3}$								
zinc plated steel ¹⁾								
Tension load	N	[kN]	4,3	5,8	7,6	11,9	16,7	23,8
Displacement	δ_{N0}	[mm]	0,4	0,5				
	$\delta_{N\infty}$	[mm]	0,7	2,3				
stainless steel								
Tension load	N	[kN]	3,6	5,7	7,6	11,9	17,2	24,0
Displacement	δ_{N0}	[mm]	0,7	0,9	0,5	0,6	0,9	2,1
	$\delta_{N\infty}$	[mm]	1,8					4,2

¹⁾ Anchor version B fvz: M8-M20

Table C5: Displacements under shear loads

Anchor size			M6	M8	M10	M12	M16	M20
zinc plated steel ¹⁾								
Shear load	V	[kN]	2,9	6,3	9,7	14,3	23,6	37,0
Displacement	δ_{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
stainless steel								
Shear load	V	[kN]	4,0	6,9	10,9	15,4	28,6	43,7
Displacement	δ_{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

¹⁾ Anchor version B fvz: M8-M20

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

Performance
Displacements

Annex C4