



... eine starke Verbindung

SUORITUSTASOILMOITUS

DoP Nro: **MKT-212** - fi

- ✧ **Tuotetyypin yksilöllinen tunniste:** **Bolt ankkuri B**
- ✧ **Aiottu käyttötarkoitus (aiotut käyttötarkoitukset):** Mekaaninen ankkuri betoniin ankkurointiin, katso liite / Annex B
- ✧ **Valmistaja:** MKT Metall-Kunststoff-Technik GmbH & Co.KG
Auf dem Immel 2
67685 Weilerbach
- ✧ **Suoritusasteen pysyvyyden arvioinnissa ja varmentamisessa käytetty järjestelmä/käytetyt järjestelmät:** 1
- ✧ **Eurooppalainen arviointiasiakirja:** **EAD 330232-00-0601**
Eurooppalainen tekninen arviointi: **ETA-01/0013, 29.11.2018**
Teknisestä arvioinnista vastaava laitos: DIBt, Berlin
Ilmoitettu laitos/ilmoitetut laitokset: NB 1343 – MPA, Darmstadt

✧ **Ilmoitettu suoritusaste/ilmoitetut suoritusasteet:**

Olennaiset ominaisuudet	Suoritusaste
Mekaaninen lujuus ja vakaus (BWR1)	
Ominaisvastus vetojännityksen aikana (staattiset ja kvasi-staattiset vaikutukset)	Liite/Annex C1 – C2
Karakteristinen vastustus sivusuunnassa (staattiset ja kvasi-staattiset vaikutukset)	Liite/Annex C3
Vuorossa (staattiset ja kvasi-staattiset vaikutukset)	Liite/Annex C4
Karakteristinen vastus siirtymässä seismisten suorituskykyluokkien C1 + C2 osalta	NPD (No Performance Determined) suoritusastea ei ole määritetty
Paloturvallisuus (BWR2)	
Palokäyttäytyminen	Luokka A1
Palonkestävyys	NPD (No Performance Determined) suoritusastea ei ole määritetty

Edellä yksilöidyn tuotteen suoritusaste on ilmoitettujen suoritusasteiden joukon mukainen. Tämä suoritusasteoilmoitus on asetuksen (EU) N:o 305/2011 mukaisesti annettu edellä ilmoitetun valmistajan yksinomaisella vastuulla.

Valmistajan puolesta allekirjoittanut:


Stefan Weustenhagen
(Toimitusjohtaja)
Weilerbach, 29.11.2018

p.p.


Dipl.-Ing. Detlef Bigalke
(Tuotekehityksen johtaja)



Tämän suoritusasteoilmoituksen alkuperäinen teksti on kirjoitettu saksaksi. Jos käännökset poikkeavat toisistaan, saksankielinen versio on pätevä.

Specifications of intended use

Wedge Anchor B			M6	M8	M10	M12	M16	M20
Materials	Steel zinc plated	electroplated	✓	✓	✓	✓	✓	✓
		hot-dip galvanized	-	✓	✓	✓	✓	✓
		sherardized	✓	✓	✓	✓	✓	✓
	Stainless steel	A4	✓	✓	✓	✓	✓	✓
	High corrosion resistant steel	HCR	✓	✓	✓	✓	✓	✓
Static or quasi-static action								✓
Reduced anchorage depth								✓
Uncracked concrete								✓

Base materials:

- Compacted, reinforced or unreinforced normal weight concrete (without fibers) acc. to EN 206:2013
- Strength classes C20/25 to C50/60 according to EN 206:2013

Use conditions (Environmental conditions):

Structures subject to dry internal conditions	zinc plated steel, stainless steel A4, high corrosion resistant steel HCR
Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist	stainless steel A4, high corrosion resistant steel HCR
Structures subject to external atmospheric exposure and to permanently damp internal condition, if other particular aggressive conditions exist ¹⁾	high corrosion resistant steel HCR

¹⁾ Particular aggressive conditions are e.g. permanent, alternating 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.).
- Anchorages are designed according to EN 1992-4:2018 or TR 055

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not in the direction of load application.
- Anchor installation such that the effective anchorage depth is complied with. This compliance is ensured, if the thickness of fixture is not greater than the maximum thickness of fixture marked on the anchor in accordance with Annex A1 and A2 and the hexagon nut is placed at the end of the conical bolt as delivered by the manufacturer.

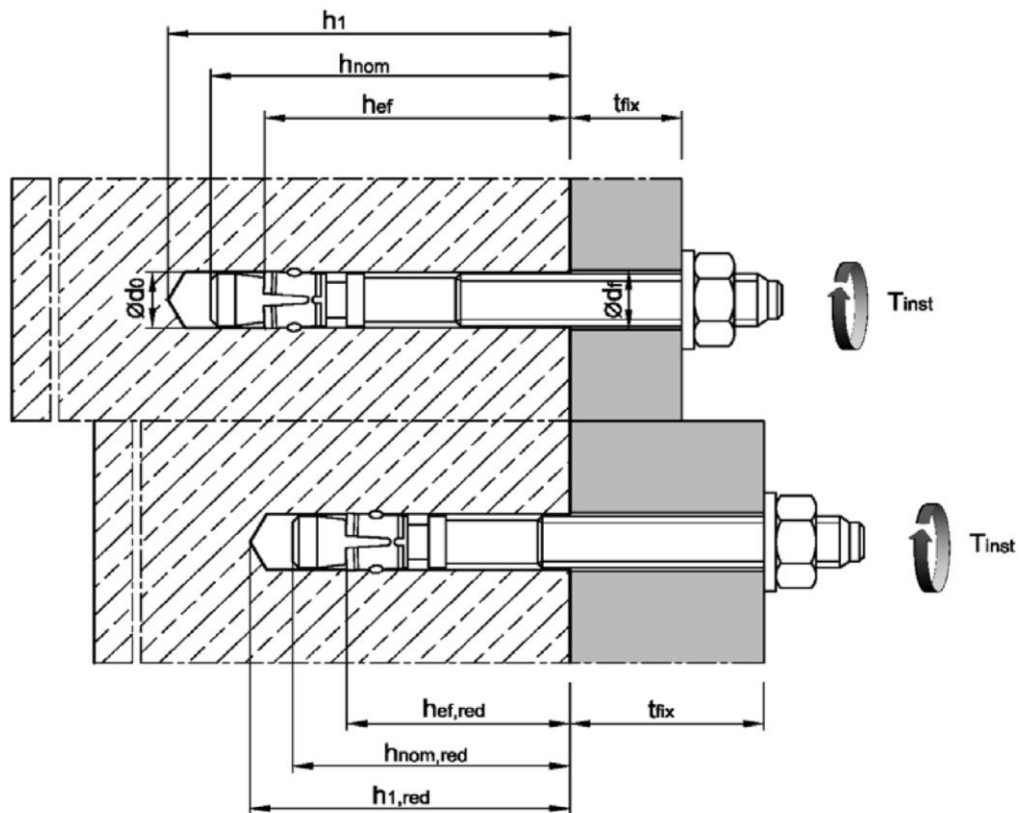
Wedge Anchor B

Intended use
Specifications

Annex B1

Table B1: Installation parameters, steel zinc plated

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 (electroplated)	$T_{inst} =$ [Nm]	8	15	30	50	100	200
Installation torque (hot-dip galvanized)	$T_{inst} =$ [Nm]	-	15	30	40	90	120
Installation torque (sherardized)	$T_{inst} =$ [Nm]	5	15	30	40	90	120
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	12	14	18	22
Standard anchorage depth							
Depth of drill hole	$h_1 \geq$ [mm]	55	65	70	90	110	130
Embedment depth	$h_{nom} \geq$ [mm]	49	56	62	82	102	121
Effective anchorage depth	$h_{ef} \geq$ [mm]	40	44	48	65	82	100
Reduced anchorage depth							
Depth of drill hole	$h_{1,red} \geq$ [mm]	45	55	65	75	95	110
Embedment depth	$h_{nom,red} \geq$ [mm]	39	47	56	67	84	99
Effective anchorage depth	$h_{ef,red} \geq$ [mm]	30	35	42	50	64	78



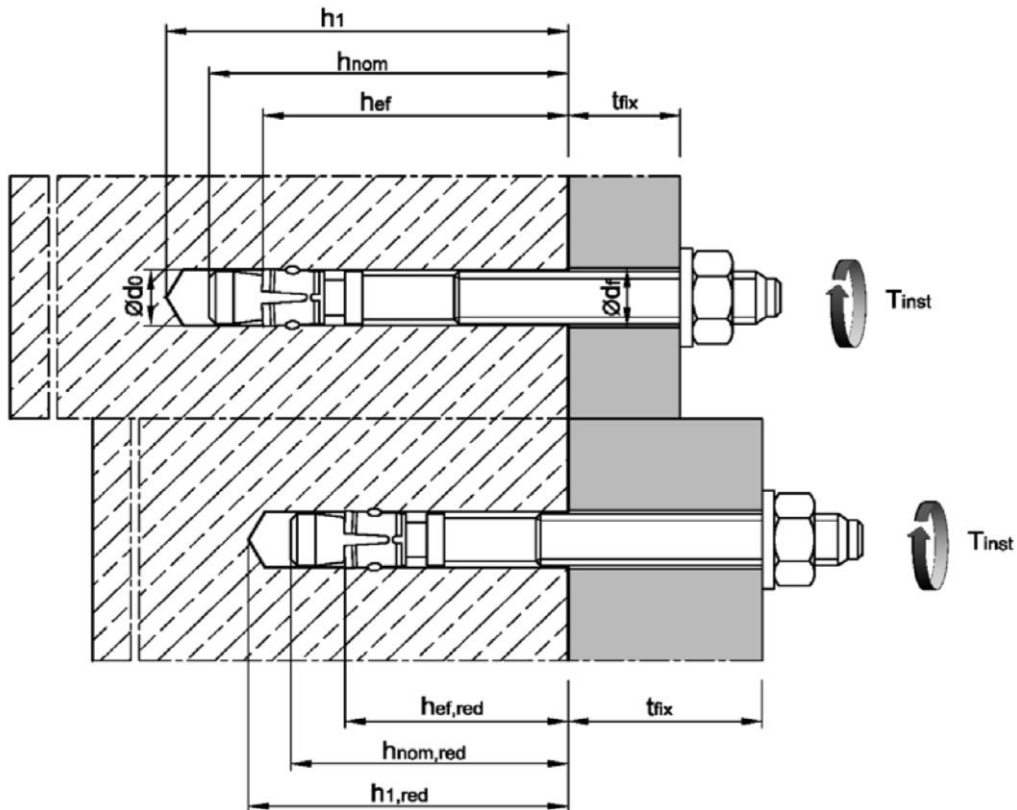
Wedge Anchor B

Intended use
Installation data, steel zinc plated

Annex B2

Table B2: Installation parameters, stainless steel A4 / HCR

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	$T_{inst} =$ [Nm]	6	15	25	50	100	160
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	12	14	18	22
Standard anchorage depth							
Depth of drill hole	$h_1 \geq$ [mm]	55	65	70	90	110	130
Embedment depth	$h_{nom} \geq$ [mm]	49	56	62	81	99	121
Effective anchorage depth	$h_{ef} \geq$ [mm]	40	44	48	65	80	100
Reduced anchorage depth							
Depth of drill hole	$h_{1,red} \geq$ [mm]	45	55	65	75	95	110
Embedment depth	$h_{nom,red} \geq$ [mm]	39	47	56	66	83	99
Effective anchorage depth	$h_{ef,red} \geq$ [mm]	30	35	42	50	64	78



Wedge Anchor B

Intended use
Installation data, stainless steel A4/HCR

Annex B3

Table B3: Minimum spacings and edge distances, steel zinc plated

Anchor size			M6	M8	M10	M12	M16	M20
Standard anchorage depth h_{ef}								
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
Reduced anchorage depth $h_{ef,red}$								
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

Table B4: Minimum spacings and edge distances, stainless steel A4 / HCR

Anchor size			M6	M8	M10	M12	M16	M20
Standard anchorage depth h_{ef}								
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
Reduced anchorage depth $h_{ef,red}$								
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

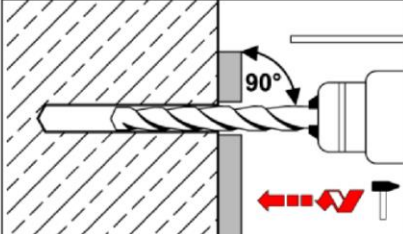
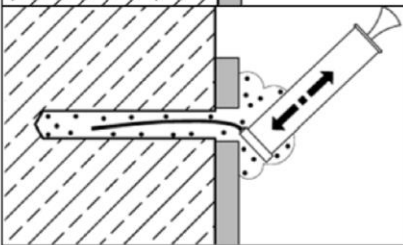
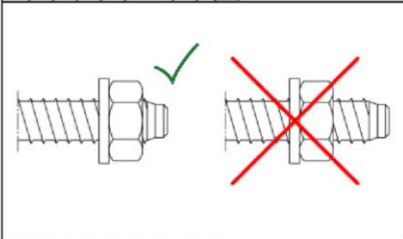
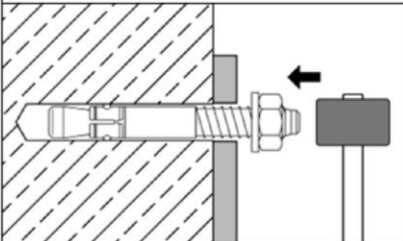
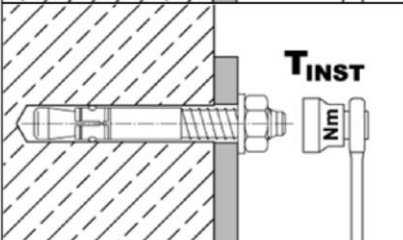
Intermediate values by linear interpolation.

Wedge Anchor B

Intended use
Minimum spacings and edge distances

Annex B4

Installation instructions

	<p>Drill hole perpendicular to concrete surface, positioning of the drill holes without damaging the reinforcement.</p>
	<p>Blow out dust.</p>
	<p>Check position of nut.</p>
	<p>Drive in anchor, such that h_{ef} or $h_{ef,red}$ is met. This is ensured, if the thickness of fixture is not greater than the maximum thickness of fixture marked on the anchor in accordance with Annex A2 and A3.</p>
	<p>Apply installation torque T_{inst} as specified in Table B2.</p>

Wedge Anchor B

Intended use
Installation instructions

Annex B5

Table C1: Characteristic values for tension loads, steel zinc plated

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	γ_{Ms} [-]	1,5				1,6	
Pull-out							
Standard anchorage depth h_{ef}							
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$ [kN]	9	12	16	1)	1)	1)
Reduced anchorage depth $h_{ef,red}$							
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$ [kN]	6 ²⁾	1) 2)	1)	1)	1)	1)
Increasing factor for $N_{Rk,p}$	ψ_C [-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$					
Splitting							
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$ [kN]	min [$N_{Rk,p}$; $N^0_{Rk,c}$]					
Standard anchorage depth h_{ef}							
Spacing	$s_{cr,sp}$ [mm]	160	220	240	330	410	500
Edge distance	$c_{cr,sp}$ [mm]	80	110	120	165	205	250
Reduced anchorage depth $h_{ef,red}$							
Spacing	$s_{cr,sp}$ [mm]	180	210	230	240	320	400
Edge distance	$c_{cr,sp}$ [mm]	90	105	115	120	160	200
Concrete cone failure							
Standard anchorage depth h_{ef}							
Effective anchorage depth	$h_{ef} \geq$ [mm]	40	44	48	65	82	100
Spacing	$s_{cr,N}$ [mm]	3 h_{ef}					
Edge distance	$c_{cr,N}$ [mm]	1,5 h_{ef}					
Reduced anchorage depth $h_{ef,red}$							
Effective anchorage depth	$h_{ef,red} \geq$ [mm]	30 ²⁾	35 ²⁾	42	50	64	78
Spacing	$s_{cr,N}$ [mm]	3 $h_{ef,red}$					
Edge distance	$c_{cr,N}$ [mm]	1,5 $h_{ef,red}$					
Factor for k_1	$k_{ucr,N}$ [-]	11,0					

¹⁾ Pullout failure is not decisive

²⁾ Use restricted to anchorages of indeterminate structural components

Wedge Anchor B

Performance
Characteristic values for tension loads, steel zinc plated

Annex C1

Table C2: Characteristic values for tension loads, stainless steel A4 / HCR

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	γ_{Ms}	[-]	1,50						1,68
Pull-out									
Standard anchorage depth h_{ef}									
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	7,5	12	16	25	1)	1)	
Reduced anchorage depth $h_{ef,red}$									
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	6 ²⁾	9 ²⁾	12	1)	1)	1)	
Splitting									
Standard anchorage depth h_{ef}									
The higher one of the decisive resistances of Case 1 and Case 2 is applicable.									
Case 1									
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[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}						
Case 2									
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	7,5	12	16	25	1)	1)	
Spacing	$S_{cr,sp}$	[mm]	160	220	240	340	410	560	
Edge distance	$C_{cr,sp}$	[mm]	80	110	120	170	205	280	
Reduced anchorage depth $h_{ef,red}$									
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	6 ²⁾	9 ²⁾	12	1)	1)	1)	
Spacing	$S_{cr,sp}$	[mm]	180	210	230	300	320	400	
Edge distance	$C_{cr,sp}$	[mm]	90	105	115	150	160	200	
Increasing factor for $N_{Rk,p}$ and $N^0_{Rk,sp}$	ψ/C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$						
Concrete cone failure									
Standard anchorage depth h_{ef}									
Effective anchorage depth	h_{ef}	[mm]	40	44	48	65	80	100	
Spacing	$S_{cr,N}$	[mm]	3 h_{ef}						
Edge distance	$C_{cr,N}$	[mm]	1,5 h_{ef}						
Reduced anchorage depth $h_{ef,red}$									
Effective anchorage depth	$h_{ef,red}$	[mm]	30 ²⁾	35 ²⁾	42	50	64	78	
Spacing	$S_{cr,N}$	[mm]	3 h_{ef}						
Edge distance	$C_{cr,N}$	[mm]	1,5 h_{ef}						
Factor for k_1	$k_{ucr,N}$	[-]	11,0						

1) Pullout failure is not decisive.

2) Use restricted to anchorages of indeterminate structural components.

Wedge Anchor B

Performance

Characteristic values for tension loads, stainless steel A4 / HCR

Annex C2

Table C3: Characteristic values for shear loads, steel zinc plated

Anchor size			M6	M8	M10	M12	M16	M20
Installation factor	γ_{inst}	[-]	1,0					
Steel failure without lever arm								
Characteristic resistance	$V_{Rk,s}^0$	[kN]	5	11	17	25	44	69
Ductility factor	k_7	[-]	1,0					
Steel failure with lever arm								
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	9	23	45	78	186	363
Partial factor for $V_{Rk,s}^0$ and $M_{Rk,s}^0$	γ_{Ms}	[-]	1,25				1,33	
Concrete pry-out failure								
Factor for h_{ef}	k_8	[-]	1,0	1,0	1,0	2,0	2,0	2,0
Factor for $h_{ef,red}$	k_8	[-]	1,0 ¹⁾	1,0 ¹⁾	1,0	1,0	2,0	2,0
Concrete edge failure								
Effective length of anchor in shear loading for h_{ef}	l_f	[mm]	40	44	48	65	82	100
Effective length of anchor in shear loading for $h_{ef,red}$	l_f	[mm]	30 ¹⁾	35 ¹⁾	42	50	64	78
Outside diameter of anchor	d_{nom}	[mm]	6	8	10	12	16	20

¹⁾ Use restricted to anchorages of indeterminate structural components

Table C4: Characteristic values for shear loads, stainless steel A4/HCR

Anchor Size			M6	M8	M10	M12	M16	M20
Installation factor	γ_{inst}	[-]	1,0					
Steel failure without lever arm								
Characteristic resistance	$V_{Rk,s}^0$	[kN]	7	12	19	27	50	86
Ductility factor	k_7	[-]	1,0					
Steel failure with lever arm								
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	10	24	49	85	199	454
Partial factor for $V_{Rk,s}^0$ and $M_{Rk,s}^0$	γ_{Ms}	[-]	1,25				1,4	
Concrete pry-out failure								
Factor for h_{ef}	k_8	[-]	1,0	1,0	1,0	2,0	2,0	2,0
Factor for $h_{ef,red}$	k_8	[-]	1,0 ¹⁾	1,0 ¹⁾	1,0	1,0	2,0	2,0
Concrete edge failure								
Effective length of anchor in shear loading with h_{ef}	l_f	[mm]	40	44	48	65	80	100
Effective length of anchor in shear loading with $h_{ef,red}$	l_f	[mm]	30 ¹⁾	35 ¹⁾	42	50	64	78
Outside diameter of anchor	d_{nom}	[mm]	6	8	10	12	16	20

¹⁾ Use restricted to anchorages of indeterminate structural components

Wedge Anchor B

Performance
Characteristic values for shear loads

Annex C3

Table C5: Displacements under tension loads, steel zinc plated

Anchor size			M6	M8	M10	M12	M16	M20
Standard anchorage depth								
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				
Reduced anchorage depth								
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				

Table C6: Displacements under tension loads, stainless steel A4/HCR

Anchor size			M6	M8	M10	M12	M16	M20
Standard anchorage depth								
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
Reduced anchorage depth								
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

Table C7: Displacements under shear loads, steel zinc plated

Anchor size			M6	M8	M10	M12	M16	M20
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

Table C8: Displacements under shear loads, stainless steel A4/HCR

Anchor Size			M6	M8	M10	M12	M16	M20
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

Wedge Anchor BPerformance
Displacements**Annex C4**