Deutsches Institut für Bautechnik

Public-law institution jointly founded by the federal states and the Federation

European Technical Assessment Body for construction products

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European Technical Assessment ETA-25/0621 of 30 September 2025

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Wedge Anchor BZ1
Product family to which the construction product belongs	Mechanical fastener for use in concrete
Manufacturer	MKT Metall-Kunststoff-Technik GmbH & Co. KG Auf dem Immel 2 67685 Weilerbach GERMANY
Manufacturing plant	MKT Metall-Kunststoff-Technik GmbH & Co. KG Auf dem Immel 2 67685 Weilerbach
This European Technical Assessment contains	16 pages including 3 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 330232-01-0601, Edition 05/2021

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Specific Part

1 Technical description of the product

The Wedge Anchor BZ1 is a fastener made of galvanized steel, which is placed into a drilled hole and anchored by torque-controlled expansion.

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the fastener is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the fastener of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	See Annex C 1
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C 2
Characteristic resistance for seismic performance category C1 and C2	See Annex C 3
Displacements	See Annex C 4

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C 5

3.3 Aspects of durability

Essential characteristic	Performance
Durability	See Annex B 1

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with the European Assessment Document EAD 330232-01-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

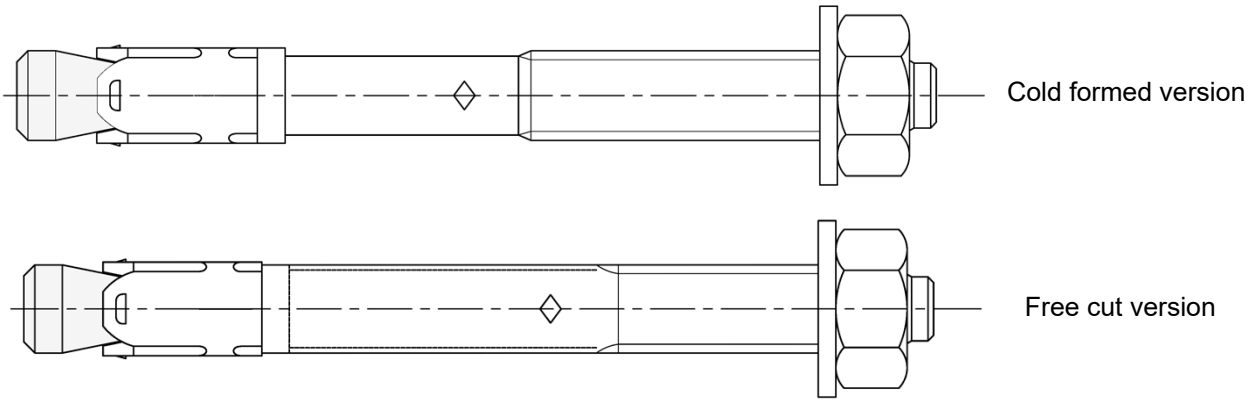
Issued in Berlin on 30 September 2025 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Ziegler

Wedge Anchor BZ1

M8 to M20



Installation condition

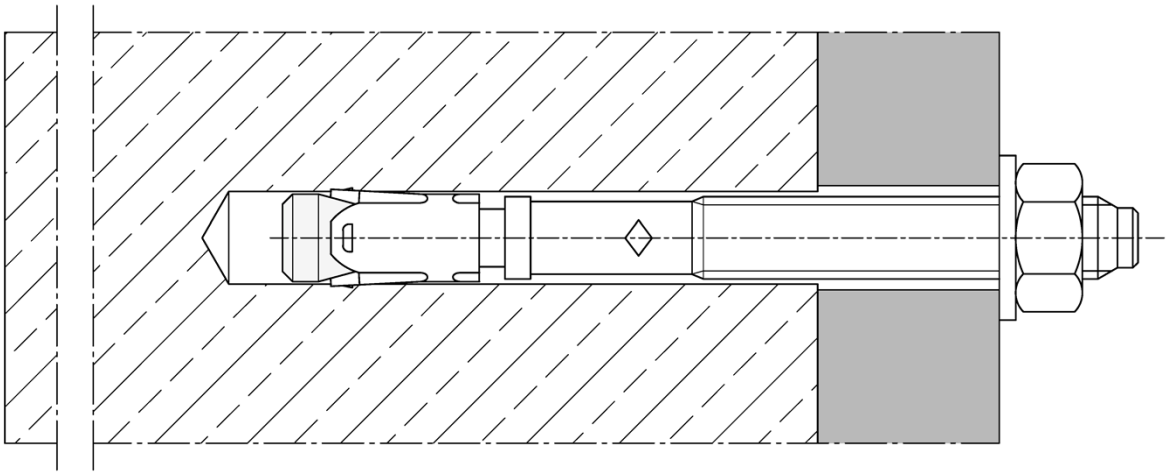


Table A1: Material

No.	Part	BZ1
		Steel, zinc plated
1	Conical bolt	Cold formed or machined steel, galvanized ≥ 5 µm, Cone plastic coated
2	Expansion sleeve	Stainless steel (e.g. material number 1.4301 or 1.4401 according to EN 10088-1:2023)
3a	Washer	Steel, zinc plated, galvanized ≥ 5 µm
3b	Filling Washer	
4	Hexagon nut	Steel, galvanized ≥ 5 µm, coated

Wedge Anchor BZ1	**Annex A 1**
Product description Fastener, installation condition, material	

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Marking

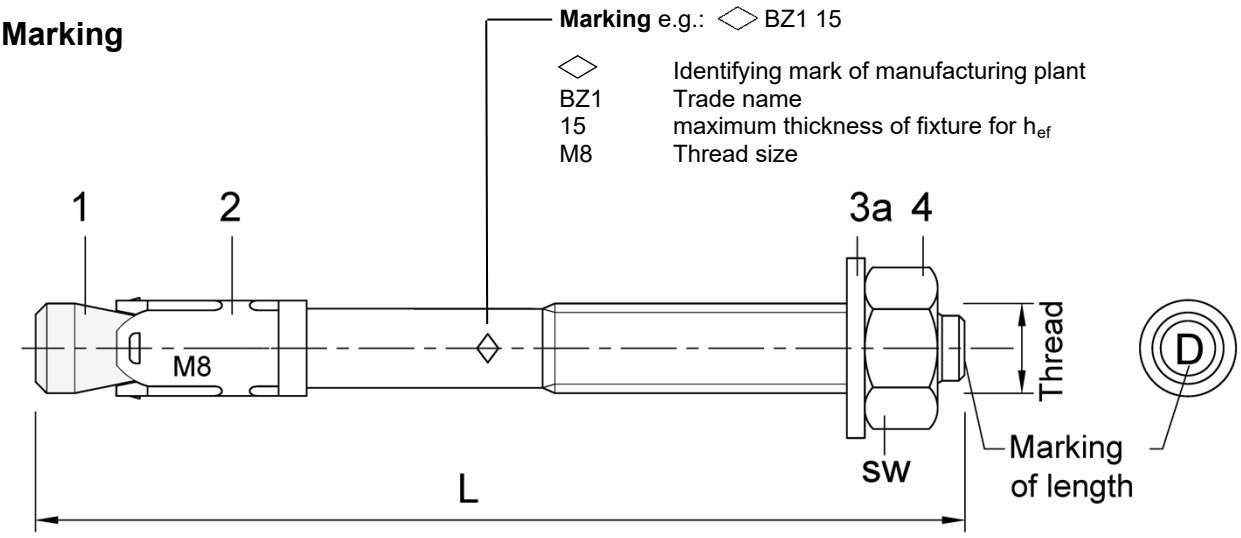


Table A2: Length identification

Marking of length	C (c)	D (d)	E (e)	F (f)	G (g)	H (h)	I (i)	J (j)	K (k)	L (l)	M (m)	N (n)
Length of anchor min ≥	63,5	76,2	88,9	101,6	114,3	127,0	139,7	152,4	165,1	177,8	190,5	203,2
Length of anchor max <	76,2	88,9	101,6	114,3	127,0	139,7	152,4	165,1	177,8	190,5	203,2	215,9

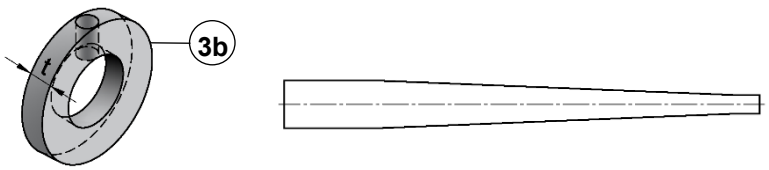
Marking of length	O (o)	P (p)	Q (q)	R (r)	S (s)	T (t)	U (u)	V (v)	W (w)	X (x)	Y (y)	Z (z)
Length of anchor min ≥	215,9	228,6	241,3	254,0	279,4	304,8	330,2	355,6	381,0	406,4	431,8	457,2
Length of anchor max <	228,6	241,3	254,0	279,4	304,8	330,2	355,6	381,0	406,4	431,8	457,2	483,0

Table A3: Fastener dimensions

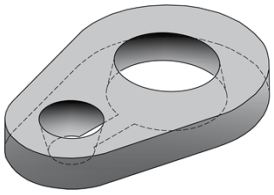
Fastener size		M8	M10	M12	M16	M20
Conical bolt	Thread	M8	M10	M12	M16	M20
Length of anchor	L	65 + t_{fix}	80 + t_{fix}	96,5+t_{fix}	118+t_{fix}	137+t_{fix}
Thickness of filling washer	t [mm]	5	5	5	5	5
Hexagon nut	SW	13	17	19	24	30

Dimensions in mm

Filling washer VS with reducing adapter



Alternate filling washer



Wedge Anchor BZ1

Product description
Marking and dimensions

Annex A 2

Specifications of intended use

Wedge Anchor BZ1		M8	M10	M12	M16	M20
Steel, galvanized		✓				
Static or quasi-static action		✓				
Seismic action [1]	Category C1	✓				
	Category C2	- [2]	✓	✓	✓	✓
Fire exposure		✓				

[1] only cold formed anchors
[2] no performance assessed

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibres according to EN 206:2013+A2:2021
- Strength classes C20/25 to C50/60 according to EN 206:2013+A2:2021
- Cracked or uncracked concrete

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions

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 EN 1992-4:2018

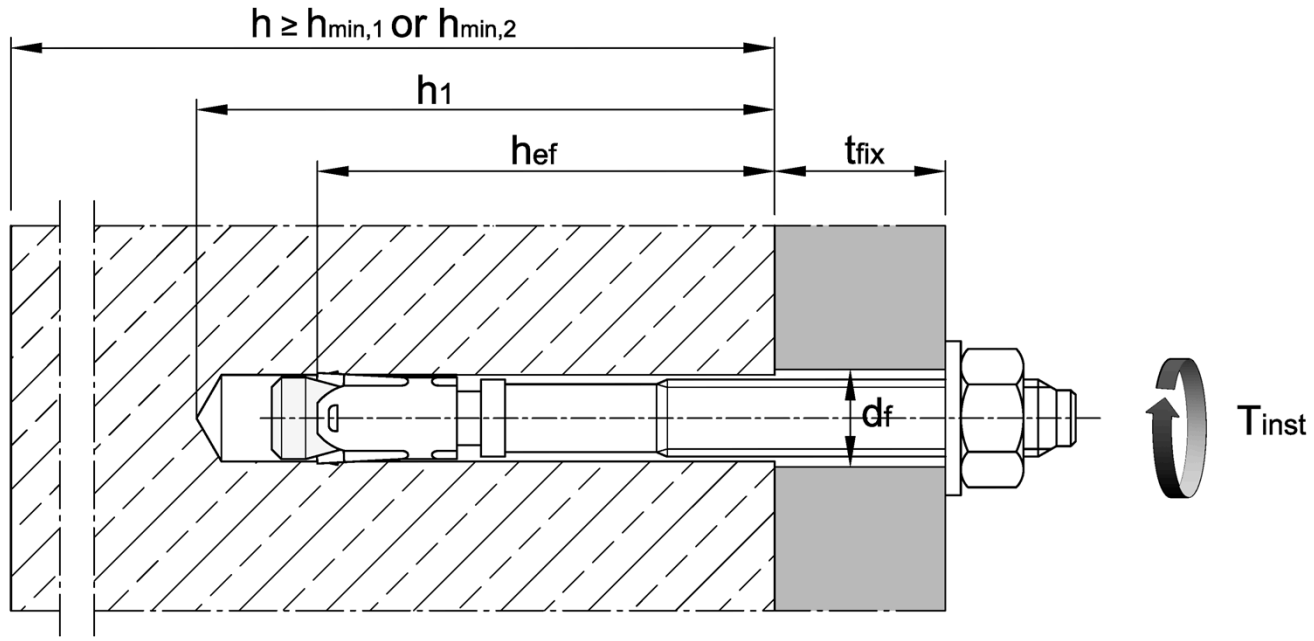
Installation:

- Hole drilling by hammer drill bit or vacuum drill bit
- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on site
- Optionally, the annular gap between fixture and stud of the BZ1 can be filled to reduce the hole clearance. For this purpose, the filling washer (3b) must be used in addition to the supplied washer (3a). For filling use high-strength mortar with compressive strength ≥ 40 N/mm² (e.g. Injection System VMZ, VMU plus or VMH)

Wedge Anchor BZ1	**Annex B 1**
Intended Use Specifications	

Table B1: Installation parameters

Fastener size			M8	M10	M12	M16	M20
Nominal drill hole diameter	d_0	[mm]	8	10	12	16	20
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8,45	10,45	12,5	16,5	20,55
Installation torque	T_{inst}	[Nm]	20	25	45	90	160
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	9	12	14	18	22
Depth of drill hole	$h_1 \geq$	[mm]	60	75	90	110	125
Effective anchorage depth	h_{ef}	[mm]	46	60	70	85	100



Wedge Anchor BZ1

Intended Use
Installation parameters

Annex B 2

Table B2: Minimum **spacing** and **edge distance**

Fastener size			**M8**	**M10**	**M12**	**M16**	**M20**
Standard thickness of concrete member							
Standard thickness of member	$h_{min,1}$	[mm]	100	120	140	170	200
Cracked concrete							
Minimum spacing	s_{min}	[mm]	40	45	60	60	95
	for c ≥	[mm]	70	70	100	100	150
Minimum edge distance	c_{min}	[mm]	40	45	60	60	95
	for s ≥	[mm]	80	90	140	180	200
Uncracked concrete							
Minimum spacing	s_{min}	[mm]	40	45	60	65	90
	for c ≥	[mm]	80	70	120	120	180
Minimum edge distance	c_{min}	[mm]	50	50	75	80	130
	for s ≥	[mm]	100	100	150	150	240
Minimum thickness of concrete member							
Minimum thickness of member	$h_{min,2}$	[mm]	80	100	120	140	-[1)]
Cracked concrete							
Minimum spacing	s_{min}	[mm]	40	45	60	70	-[1)]
	for c ≥	[mm]	70	90	100	160	-[1)]
Minimum edge distance	c_{min}	[mm]	40	50	60	80	-[1)]
	for s ≥	[mm]	80	115	140	180	-[1)]
Uncracked concrete							
Minimum spacing	s_{min}	[mm]	40	60	60	80	-[1)]
	for c ≥	[mm]	80	140	120	180	-[1)]
Minimum edge distance	c_{min}	[mm]	50	90	75	90	-[1)]
	for s ≥	[mm]	100	140	150	200	-[1)]
Fire exposure from one side							
Minimum spacing	$s_{min,fi}$	[mm]	see normal ambient temperature				
Minimum edge distance	$c_{min,fi}$	[mm]	see normal ambient temperature				
Fire exposure from more than one side							
Minimum spacing	$s_{min,fi}$	[mm]	see normal ambient temperature				
Minimum edge distance	$c_{min,fi}$	[mm]	≥ 300 mm				

[1)] No performance assessed

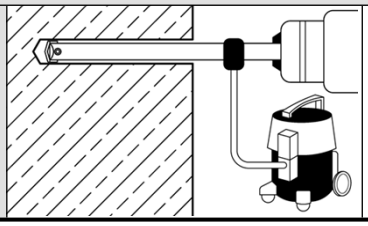
Intermediate values by linear interpolation

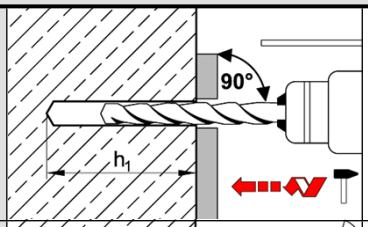
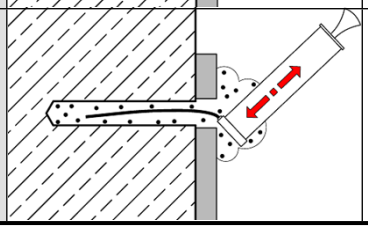
Wedge Anchor BZ1

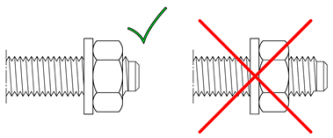
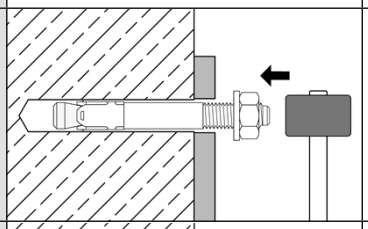
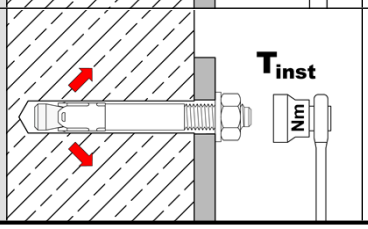
Intended Use
Minimum spacing and edge distance

Annex B 3

Installation instructions

Hole drilling and cleaning – vacuum drilling		
1a		Drill hole perpendicular to concrete surface. Proceed with **step 3.**

Hole drilling and cleaning – hammer drilling		
1b		Drill hole perpendicular to concrete surface.
2		Blow out dust. Alternatively vacuum clean down to the bottom of the hole.

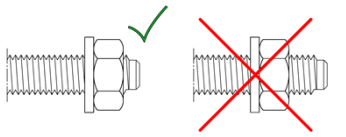
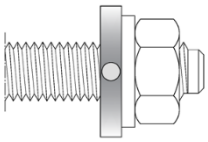
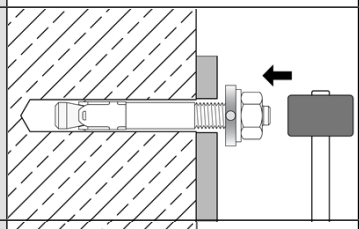
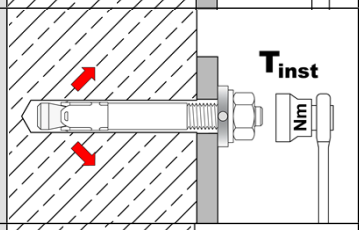
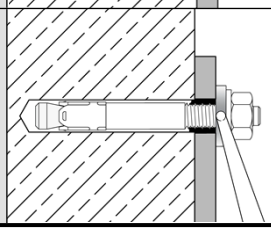
Insert fastener		
3		Check position of nut.
4		Drive in anchor, such that h_{ef} is met. This compliance is ensured, if the thickness of fixture is not greater than the maximum thickness of fixture marked on the anchor in accordance with Annex A2.
5		Apply installation torque T_{inst} using a calibrated torque wrench.

Wedge Anchor BZ1

Intended Use
Installation instructions

Annex B 4

Installation instructions - continuation

Insert fastener with filling of annular gap		
3a		Check position of nut.
3b		Fit the filling washer to the fastener. The thickness of the filling washer must be taken into account with t_{fix}.
4		Drive in fastener with filling washer, such that h_{ef} is met. This compliance is ensured, if the thickness of fixture is 5mm smaller than the maximum thickness of fixture marked on the fastener in accordance with Annex A2.
5		Apply installation torque T_{inst} using a calibrated torque wrench.
6		Fill the annular gap between stud and fixture with high strength mortar with compressive strength ≥ 40 N/mm² (e.g. 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.

Wedge Anchor BZ1	**Annex B 5**
Intended Use Installation with filling of annular gap	

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Table C1: Characteristic resistance to **tension load**

Fastener size			**M8**	**M10**	**M12**	**M16**	**M20**
Installation factor	γ_{inst}	[-]	1,0				
Steel failure							
Characteristic resistance	$N_{Rk,s}$	[kN]	16	27	40	60	86
Partial safety factor [1)]	γ_{Ms}	[-]	1,53		1,5		1,6
Pull-out failure							
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p,ucr}$	[kN]	12	16	25	35	50
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p,cr}$	[kN]	5	9	16	25	36
Splitting For the proof against splitting failure $N^0_{Rk,c}$ has to be replaced by $N^0_{Rk,sp}$ with consideration of the member thickness							
Splitting for **standard thickness of concrete member** (The higher resistance of case 1 and case 2 may be applied; the values $s_{cr,sp}$ and $c_{cr,sp}$ may be linearly interpolated for the member thickness $h_{min,2} < h < h_{min,1}$ (Case 2); $\psi_{h,sp}$= 1,0))							
Standard thickness of concrete	$h_{min,1} \geq$	[mm]	100	120	140	170	200
Case 1							
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	9	12	20	30	40
Characteristic edge distance	$c_{cr,sp}$	[mm]	1,5 h_{ef}				
Characteristic spacing	$s_{cr,sp}$	[mm]	3 h_{ef}				
Case 2							
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	12	16	25	35	50
Characteristic edge distance	$c_{cr,sp}$	[mm]	2 h_{ef}				2,2 h_{ef}
Characteristic spacing	$s_{cr,sp}$	[mm]	4 h_{ef}				4,4 h_{ef}
Splitting for **minimum thickness of concrete member**							
Minimum thickness of concrete	$h_{min,2} \geq$	[mm]	80	100	120	140	no performance assessed
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	12	16	25	35	
Characteristic edge distance	$c_{cr,sp}$	[mm]	2,5 h_{ef}				
Characteristic spacing	$s_{cr,sp}$	[mm]	5 h_{ef}				
Increasing factor for concrete $N_{Rk,p} = \psi_c \cdot N_{Rk,p}$ (C20/25) or $N^0_{Rk,sp} = \psi_c \cdot N^0_{Rk,sp}$ (C20/25)	ψ_c	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$				
Concrete cone failure							
Effective anchorage depth	h_{ef}	[mm]	46	60	70	85	100
Characteristic edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}				
Characteristic spacing	$s_{cr,N}$	[mm]	3 h_{ef}				
Factor: cracked concrete	$k_{cr,N}$	[-]	7,7				
Factor: uncracked concrete	$k_{ucr,N}$	[-]	11,0				

[1)] In absence of other national regulations.

Wedge Anchor BZ1

Performance
Characteristic resistance to **tension load**

Annex C 1

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Table C2: Characteristic resistance to **shear load**

Fastener size			**M8**	**M10**	**M12**	**M16**	**M20**
Installation factor	γ_{inst}	[-]	1,0				
Steel failure without lever arm							
Characteristic shear resistance	$V^0_{Rk,s}$	[kN]	8,5	14,1	21,0	38,5	48,3
Partial factor [1)]	γ_{Ms}	[-]	1,25				1,33
Ductility factor	k_7	[-]	1,0				
Steel failure with lever arm							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	16,1	32,9	57,4	151,2	254,1
Partial factor [1)]	γ_{Ms}	[-]	1,25				1,33
Concrete pry-out failure							
Pry-out factor	k_8	[-]	1,0	2,0			
Concrete edge failure							
Effective length of fastener in shear loading	l_f	[mm]	46	60	70	85	100
Outside diameter of fastener	d_{nom}	[mm]	8	10	12	16	20

[1)] In absence of other national regulations.

Wedge Anchor BZ1	**Annex C 2**
Performance Characteristic resistance to **shear load**	

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Table C3: Characteristic resistance for **seismic performance category C1** and **C2**

Fastener size				**M8**	**M10**	**M12**	**M16**	**M20**
Tension loads								
Installation factor		γ_{inst}	[-]	1,0				
Steel failure								
Characteristic resistance **C1**		$N_{Rk,s,C1}$	[kN]	16	27	40	60	86
Characteristic resistance **C2**		$N_{Rk,s,C2}$	[kN]	- [2]	27	40	60	86
Partial factor [1]		γ_{Ms}	[-]	1,53		1,5		1,6
Pull-out								
Characteristic resistance **C1**		$N_{Rk,p,C1}$	[kN]	5	9	16	25	36
Characteristic resistance **C2**		$N_{Rk,p,C2}$	[kN]	- [2]	3,6	10,2	13,8	24,4
Shear loads								
Steel failure without lever arm								
Characteristic resistance **C1**		$V_{Rk,s,C1}$	[kN]	4,7	10,0	13,5	22,0	34,5
Characteristic resistance **C2**		$V_{Rk,s,C2}$	[kN]	- [2]	7,0	8,1	17,9	27,6
Partial factor [1]		γ_{Ms}	[-]	1,25				1,33
Factor for annular gap	**without** filling of annular gap	α_{gap}	[-]	0,5				
	with filling of annular gap	α_{gap}	[-]	1,0				

[1] In absence of other national regulations.

[2] No performance assessed

Wedge Anchor BZ1

Performance
Characteristic resistance to **seismic performance category C1** and **C2**

Annex C 3

Table C4: Displacements

Fastener size			**M8**	**M10**	**M12**	**M16**	**M20**
Displacement under tension load							
Tension load in cracked concrete	N	[kN]	2,4	4,3	7,6	11,9	17,1
Displacement	δ_{N0}	[mm]	0,6	1,0	0,4	1,0	0,9
	$\delta_{N\infty}$	[mm]	1,4	1,2	1,4	1,3	1,0
Tension load in uncracked concrete	N	[kN]	5,7	7,6	11,9	16,7	23,8
Displacement	δ_{N0}	[mm]	0,4	0,5	0,7	0,3	0,4
	$\delta_{N\infty}$	[mm]	0,8	0,8	1,4	0,8	0,8
Displacements under seismic tension load **C2**							
Displacements for DLS	$\delta_{N,C2,(DLS)}$	[mm]	- [1)]	4,1	4,9	3,6	5,1
Displacements for ULS	$\delta_{N,C2(ULS)}$	[mm]	- [1)]	13,8	15,7	9,5	15,2
Displacement under shear load							
Shear load in cracked and uncracked concrete	V	[kN]	4,8	8,0	12,2	22,0	25,8
Displacement	δ_{V0}	[mm]	1,4	2,2	2,5	2,5	1,3
	$\delta_{V\infty}$	[mm]	2,1	3,3	3,9	3,7	1,9
Displacement under seismic shear load **C2**							
Displacements for DLS	$\delta_{V,C2(DLS)}$	[mm]	- [1)]	1,4	1,8	2,2	2,4
Displacements for ULS	$\delta_{V,C2(ULS)}$	[mm]	- [1)]	2,7	4,8	4,8	5,1

[1)] No performance assessed

Wedge Anchor BZ1

Performance
Displacements

Annex C 4

Table C5: Characteristic resistance to fire

Fastener size				**M8**	**M10**	**M12**	**M16**	**M20**
Tension load								
Steel failure								
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	0,4	0,9	1,7	3,1	4,9
	R60			0,3	0,8	1,3	2,4	3,7
	R90			0,3	0,6	1,1	2,0	3,2
	R120			0,2	0,5	0,8	1,6	2,5
Shear load								
Steel failure without lever arm								
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	0,4	0,9	1,7	3,1	4,9
	R60			0,3	0,8	1,3	2,4	3,7
	R90			0,3	0,6	1,1	2,0	3,2
	R120			0,2	0,5	0,8	1,6	2,5
Steel failure with lever arm								
Characteristic resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	0,4	1,1	2,6	6,6	13,0
	R60			0,3	1,0	2,0	5,0	9,7
	R90			0,3	0,7	1,7	4,3	8,4
	R120			0,2	0,6	1,3	3,3	6,5

Wedge Anchor BZ1

Performance
Characteristic resistance to **fire**

Annex C 5