...eine starke Verbindung

TELJESÍTMÉNYNYILATKOZAT

DoP Száma: **MKT-1.4-101_hu**

✧ **A terméktípus egyedi azonosító kódja:** **Wedge horgony BZ3 dynamic**

✧ **Felhasználás célja(i):** Utószerelt kötőelemek betonba fáradással összefüggő ciklikus terhelés alatt, lásd a B. Mellékletet / Annex B

✧ **Gyártó:** MKT Metall-Kunststoff-Technik GmbH & Co.KG
Auf dem Immel 2
67685 Weilerbach

✧ **Az AVCP-rendszer(ek):** 1

✧ **Az európai értékelési dokumentum:** **EAD 330250-00-0601**
Európai műszaki értékelés: **ETA-20/0117, 20.02.2023**
A műszaki értékelést végző szerv: DIBt, Berlin
Bejelentett szerv(ek): NB 2873 – Technische Universität Darmstadt

✧ **A nyilatkozatban szereplő teljesítmény(ek):**

Alapvető tulajdonságok	Teljesítmény
Mechanikai szilárdság és állékonyság (BWR 1)	
Jellemző ellenállás húzóterhelés mellett (statikus és kvázi-statikus hatások)	Melléklet / Annex B3, C2, C3
Jellemző ellenállás keresztirányú feszültség alatt (statikus és kvázi-statikus hatások)	Melléklet / Annex C4
Eltolódásokat	Melléklet / Annex C8, C9
Jellemző ellenállás és elmozdulások a szeizmikus teljesítménykategória C1 + C2 esetében	Melléklet / Annex C5
Eltolódásokat	Melléklet / Annex B1
Jellemző fáradtság-ellenállás ciklikus húzófeszültség alatt	Melléklet / Annex C1
Jellemző fáradtság-ellenállás ciklikus keresztirányú terheléseknél	
Jellemző fáradtság-ellenállás ciklikus kombinált feszültség és nyírási terhelés mellett	
Terhelés átviteli tényező ciklikus húzó- és keresztirányú terheléseknél	
Tűzbiztonság (BWR 2)	
Tűz viselkedést	Osztály A1
Tűz ellenállás	Melléklet / Annex C6, C7

A fent azonosított termék teljesítménye megfelel a bejelentett teljesítmény(ek)nek. A 305/2011/EU rendeletnek megfelelően e teljesítménynyilatkozat kiadásáért kizárólag a fent meghatározott gyártó a felelős.

A gyártó nevében és részéről aláíró személy:

Stefan Weustenhagen
(Vezérigazgató)
Weilerbach, 20.02.2023

p.p.
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(A termékfejlesztés vezetője)

A teljesítménynyilatkozat eredeti példányát németül írták. A fordítás eltérése esetén a német változat érvényes.

Specifications of intended use

Anchorages subject to:

- Fatigue cyclic loading
- Static and quasi-static action, fire exposure and seismic performance according to ETA-19/0619

Base materials:

- Cracked or uncracked concrete
- Compacted, 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
- For all other conditions according to EN 1993-1-2006+A1:2015-10, corresponding to corrosion resistance classes CRC according to Annex A2, Table A2

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 fastener is indicated on the design drawings (e.g. position of the fastener relative to reinforcement or to supports, etc.).
- Design method EN 1992-4:2018, TR 055:2018 and TR 061:2020 (design method II)

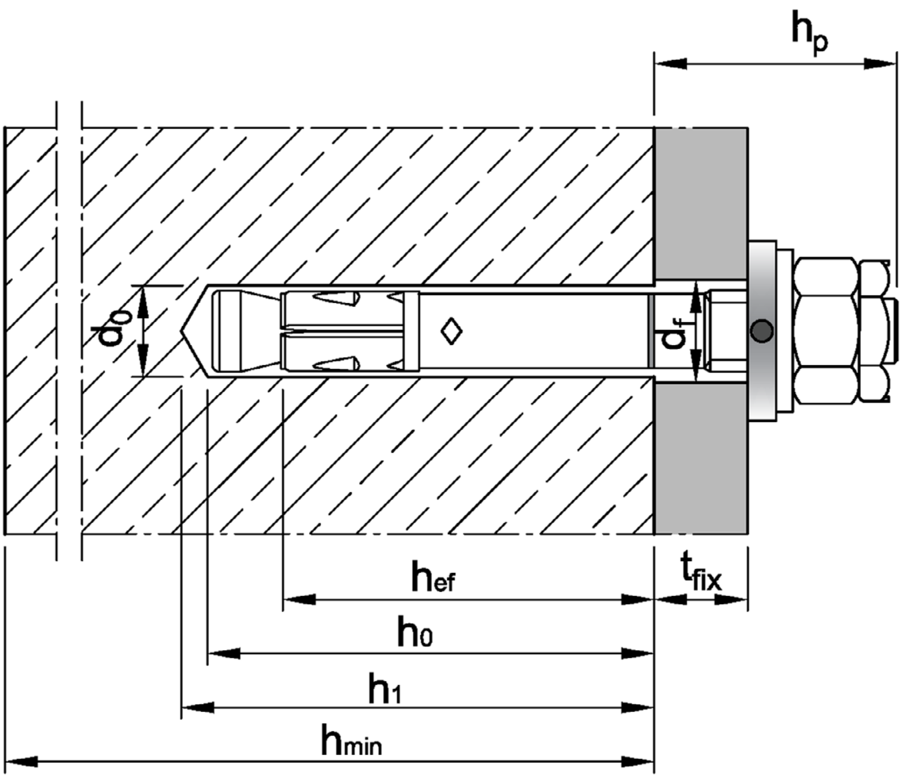
Installation:

- 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

Table B1: Installation parameters

Anchor size				M10	M12	M16
Nominal drill hole diameter		$d_0 =$	[mm]	10	12	16
Cutting diameter of drill bit		$d_{cut} \leq$	[mm]	10,45	12,5	16,5
Effective anchorage depth[1)]		$h_{ef} \geq$	[mm]	60	70	85
Depth of drill hole		$h_0 \geq$	[mm]	h_{ef} + 9	h_{ef} + 10	h_{ef} + 14
		$h_1 \geq$	[mm]	h_{ef} + 11	h_{ef} + 13	h_{ef} + 17
Diameter of clearance hole in the fixture		$d_f =$	[mm]	12	14	18
Minimum fixture thickness		$t_{fix,min} =$	[mm]	5	6	8
Installation torque	vz	$T_{inst} =$	[Nm]	40	60	110
	A4 / HCR	$T_{inst} =$	[Nm]	40	55	100
Overstand		$h_p \leq$	[mm]	21,5 + t_{fix}	25,5 + t_{fix}	29,5 + t_{fix}
Length of fastener		L	[mm]	h_{ef} + t_{fix} + 30,5	h_{ef} + t_{fix} + 35,5	h_{ef} + t_{fix} + 43
Hexagon nut		width across nut	[mm]	17	19	24
Locknut		width across nut	[mm]	17	19	24

1) End of thread must be above the concrete surface



Wedge Anchor BZ3 dynamic

Intended use
Installation parameters

Annex B2

Table B2: Minimum thickness of concrete member, minimum spacings, edge distances and required area

Anchor size			M10	M12	M16
Minimum member thickness depending on h_{ef}	$h_{min} \geq$	[mm]	$1{,}5 \cdot h_{ef}$		
Minimum edge distances and spacings					
Minimum edge distance	c_{min}	[mm]	45	55	65
	for s ≥	[mm]	see Table B4		
Minimum spacings	s_{min}	[mm]	40	50	65
	for c ≥	[mm]	see Table B4		
The following equation must be fulfilled for the calculation of the minimum spacing and edge distance during installation in connection with the anchorage depth and the member thickness:					
$A_{sp,rqd} \leq A_{sp,ef}$ Required splitting area $A_{sp,rqd}$ and idealized splitting area $A_{sp,ef}$ acc. to Table B4.					

Table B3: Applicable concrete thickness h_{sp} and area A_{sp} to determine characteristic edge distance $c_{cr,sp}$

Anchor size				M10	M12	M16
Applicable concrete thickness		h_{sp}	[mm]	$\min(h\,;\ h_{ef} + 1{,}5 \cdot c \cdot \sqrt{2})$		
Area to determine $c_{cr,sp}$	vz	A_{sp}	[mm²]	$\frac{N^0_{Rk,sp} + 2{,}040}{0{,}000693}$	$\frac{N^0_{Rk,sp} + 3{,}685}{0{,}000692}$	$\frac{N^0_{Rk,sp} + 3{,}738}{0{,}000875}$
	A4 HCR	A_{sp}	[mm²]	$\frac{N^0_{Rk,sp} + 7{,}235}{0{,}000967}$	$\frac{N^0_{Rk,sp} + 7{,}847}{0{,}000951}$	$\frac{N^0_{Rk,sp} + 11{,}415}{0{,}000742}$

Table B4: Areas to determine spacings and edge distances for installation

Anchor size				M10	M12	M16
The following equation must be fulfilled for the calculation of the minimum spacing and edge distance during installation in combination with variable anchorage depth and member thickness: $A_{sp,rqd} \leq A_{sp,ef}$						
Idealized splitting area $A_{sp,ef}$ The spacings and edge distances shall be selected or rounded in steps of 5 mm.						
Member thickness: $h > h_{ef} + 1{,}5 \cdot c$						
Single anchor or anchor group with $s \geq 3 \cdot c$						
Effective anchorage depth	$h_{ef} < 1{,}5 \cdot c$			$A_{sp,ef} = (6 \cdot c) \cdot (1{,}5 \cdot c + h_{ef})$ [mm²]		
Effective anchorage depth	$h_{ef} \geq 1{,}5 \cdot c$			$A_{sp,ef} = (6 \cdot c) \cdot (3 \cdot c)$ [mm²]		
Anchor group ($s < 3 \cdot c$)						
Effective anchorage depth	$h_{ef} < 1{,}5 \cdot c$			$A_{sp,ef} = (3 \cdot c + s) \cdot (1{,}5 \cdot c + h_{ef})$ [mm²]		
Effective anchorage depth	$h_{ef} \geq 1{,}5 \cdot c$			$A_{sp,ef} = (3 \cdot c + s) \cdot (3 \cdot c)$ [mm²]		
Member thickness: $h \leq h_{ef} + 1{,}5 \cdot c$						
Single anchor or anchor group with $s \geq 3 \cdot c$						
Effective anchorage depth	$h_{ef} < 1{,}5 \cdot c$			$A_{sp,ef} = (6 \cdot c) \cdot h$ [mm²]		
Effective anchorage depth	$h_{ef} \geq 1{,}5 \cdot c$			$A_{sp,ef} = (6 \cdot c) \cdot (h - h_{ef} + 1{,}5 \cdot c)$ [mm²]		
Anchor group ($s < 3 \cdot c$)						
Effective anchorage depth	$h_{ef} < 1{,}5 \cdot c$			$A_{sp,ef} = (3 \cdot c + s) \cdot h$ [mm²]		
Effective anchorage depth	$h_{ef} \geq 1{,}5 \cdot c$			$A_{sp,ef} = (3 \cdot c + s) \cdot (h - h_{ef} + 1{,}5 \cdot c)$ [mm²]		
Required splitting area $A_{sp,rqd}$						
vz	cracked concrete	$A_{sp,rqd}$	[mm²]	23 700	31 500	42 300
	uncracked concrete	$A_{sp,rqd}$	[mm²]	34 700	41 300	50 200
A4 HCR	cracked concrete	$A_{sp,rqd}$	[mm²]	25 900	29 800	44 300
	uncracked concrete	$A_{sp,rqd}$	[mm²]	35 700	35 300	54 800

Installation instructions

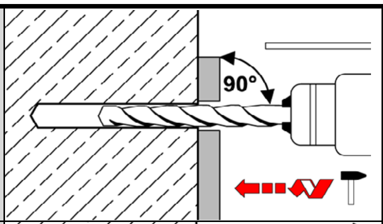
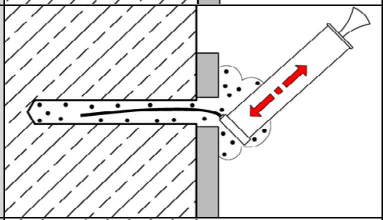
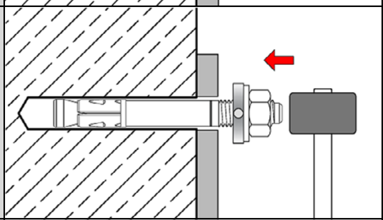
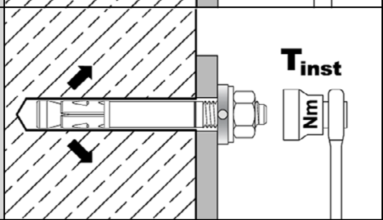
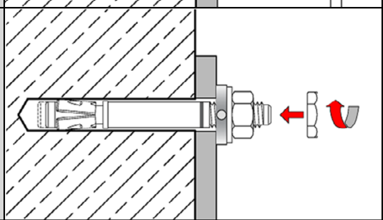
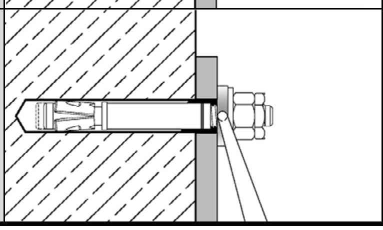
1		Drill hole perpendicular to concrete surface. If using a vacuum drill bit, proceed with step 3.
2		Blow out dust. Alternatively, vacuum clean down to the bottom of the hole.
3		Drive in fastener with filling washer until effective anchorage depth is reached.
4		Apply installation torque T_{inst} according to Table B1 by using torque wrench.
5		Screw on locknut until hand tight then tighten $^{1}/_{4}$ to ½ turn.
6		Fill the annular gap between anchor and fixture with mortar (compressive strength ≥ 40 N/mm², e.g. MKT Injection System 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.

Table C1: Characteristic values of fatigue resistance

Anchor size				M10	M12	M16
Tension load						
Steel failure						
Characteristic fatigue resistance	vz	$\Delta N_{Rk,s,0,\infty}$	[kN]	4,6	6,2	9,7
	A4		[kN]	3,2	5,3	9,2
	HCR		[kN]	2,8	5,5	9,7
Load-transfer factor for fastener groups		ψ_{FN}	[-]	0,5		
Pull-out						
Characteristic fatigue resistance		$\Delta N_{Rk,p,0,\infty}$	[kN]	0,5 $N_{Rk,p}$		
Concrete cone and splitting failure						
Characteristic fatigue resistance		$\Delta N_{Rk,c,0,\infty}$	[kN]	0,5 $N_{Rk,c}$		
		$\Delta N_{Rk,sp,0,\infty}$	[kN]	0,5 $N_{Rk,sp}$		
Effective anchorage depth		h_{ef}	[mm]	60	70	85
Shear load						
Steel failure without lever arm						
Characteristic fatigue resistance	vz	$\Delta V_{Rk,s,0,\infty}$	[kN]	2,5	4,0	7,5
	A4		[kN]	1,5	2,8	6,0
	HCR		[kN]	2,3	2,8	5,0
Load-transfer factor for fastener groups		ψ_{FV}	[-]	0,5		
Concrete pry-out failure						
Characteristic fatigue resistance		$\Delta V_{Rk,cp,0,\infty}$	[kN]	0,5 $V_{Rk,cp}$		
Concrete edge failure						
Characteristic fatigue resistance		$\Delta V_{Rk,c,0,\infty}$	[kN]	0,5 $V_{Rk,c}$		
Effective length of anchor		l_f	[mm]	60	70	85
Diameter of anchor		d_{nom}	[mm]	10	12	16
Tension and shear load						
Partial factor [1)]		$\gamma_{Ms,fat}$	[-]	1,35		
		$\gamma_{Mc,fat}$	[-]	1,5		
		$\gamma_{Msp,fat}$	[-]	1,5		
		$\gamma_{Mp,fat}$	[-]	1,5		
Exponents for combined loading		α_s	[-]	0,5	0,5	0,7
		α_c	[-]	1,5		

[1)] In absence of other national regulations

Table C2: Characteristic values for **tension loads** under static and quasi-static action, **steel, zinc plated**

Anchor size			**M10**	**M12**	**M16**
Installation factor	γ_{inst}	[-]	1,0		
Steel failure					
Characteristic resistance	$N_{Rk,s}$	[kN]	30,4	44,9	79,3
Partial factor [1)]	γ_{Ms}	[-]	1,5		
Pull-out					
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p,cr}$	[kN]	15	22	30
Increasing factor $N_{Rk,p,cr} = \psi_C \cdot N_{Rk,p,cr}$ (C20/25)	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,265}$	$\left(\frac{f_{ck}}{20}\right)^{0,5}$	$\left(\frac{f_{ck}}{20}\right)^{0,339}$
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p,ucr}$	[kN]	24	30	50
Increasing factor $N_{Rk,p,ucr} = \psi_C \cdot N_{Rk,p,ucr}$ (C20/25)	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,448}$	$\left(\frac{f_{ck}}{20}\right)^{0,5}$	$\left(\frac{f_{ck}}{20}\right)^{0,203}$
Splitting					
Characteristic resistance	$N^0_{Rk,sp}$	[kN]	min ($N_{Rk,p}$; $N^0_{Rk,c}$ [3)])		
Characteristic edge distance [2)]	$c_{cr,sp}$	[mm]	$\frac{A_{sp} + 0,8 \cdot (h_{sp} - h_{ef})^2}{(3,41 \cdot h_{sp} - 0,59 \cdot h_{ef})}$		
Characteristic spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$		
Concrete cone failure					
Effective anchorage depth	h_{ef}	[mm]	60	70	85
Characteristic edge distance	$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$		
Characteristic spacing	$s_{cr,N}$	[mm]	$2 \cdot c_{cr,N}$		
Factor — cracked concrete	$k_{cr,N}$	[-]	7,7		
Factor — uncracked concrete	$k_{ucr,N}$	[-]	11,0		

1) In absence of other national regulations
2) Applicable concrete thickness h_{sp} and area A_{sp} to determine characteristic edge distance $c_{cr,sp}$ according to Table B3
3) $N^0_{Rk,c}$ according to EN 1992-4:2018

Table C3: Characteristic values for **tension loads** under static or quasi-static action, **A4** and **HCR**

Anchor size			**M10**	**M12**	**M16**
Installation factor	γ_{inst}	[-]	1,0		
Steel failure					
Characteristic resistance	$N_{Rk,s}$	[kN]	30,4	44,9	74,6
Partial factor [1]	γ_{Ms}	[-]	1,5		
Pull-out					
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p,cr}$	[kN]	17	22	35
Increasing factor $N_{Rk,p,cr} = \psi_C \cdot N_{Rk,p,cr}$ (C20/25)	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$	$\left(\frac{f_{ck}}{20}\right)^{0,435}$	$\left(\frac{f_{ck}}{20}\right)^{0,350}$
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p,ucr}$	[kN]	25	42	50
Increasing factor $N_{Rk,p,ucr} = \psi_C \cdot N_{Rk,p,ucr}$ (C20/25)	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,364}$	$\left(\frac{f_{ck}}{20}\right)^{0,213}$	$\left(\frac{f_{ck}}{20}\right)^{0,196}$
Splitting					
Characteristic resistance	$N^0_{Rk,sp}$	[kN]	min ($N_{Rk,p}$; $N^0_{Rk,c}$ [3])		
Characteristic edge distance [2]	$c_{cr,sp}$	[mm]	$\frac{A_{sp} + 0,8 \cdot (h_{sp} - h_{ef})^2}{(3,41 \cdot h_{sp} - 0,59 \cdot h_{ef})}$		
Characteristic spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$		
Concrete cone failure					
Effective anchorage depth	h_{ef}	[mm]	60	70	85
Characteristic edge distance	$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$		
Characteristic spacing	$s_{cr,N}$	[mm]	$2 \cdot c_{cr,N}$		
Factor — cracked concrete	$k_{cr,N}$	[-]	7,7		
Factor — uncracked concrete	$k_{ucr,N}$	[-]	11,0		

[1] In absence of other national regulations

[2] Applicable concrete thickness h_{sp} and area A_{sp} according to Table B3 to determine characteristic edge distance $c_{cr,sp}$

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

Table C4: Characteristic values for **shear loads** under static and quasi-static action

Anchor size				**M10**	**M12**	**M16**
Installation factor		γ_{inst}	[-]	1,0		
Steel failure without lever arm						
Characteristic resistance	vz	$V^0_{Rk,s}$	[kN]	26,8	38,3	60,0
	A4 / HCR	$V^0_{Rk,s}$	[kN]	27,8	39,8	69,5
Partial factor [1)]		γ_{Ms}	[-]	1,25		
Ductility factor		k_7	[-]	1,0		
Steel failure with lever arm						
Characteristic bending resistance	vz	$M^0_{Rk,s}$	[Nm]	60	105	240
	A4 / HCR	$M^0_{Rk,s}$	[Nm]	55	99	223
Partial factor [1)]		γ_{Ms}	[-]	1,25		
Concrete pry-out failure						
Pry-out factor	vz	k_8	[-]	3,1	3,0	3,6
	A4 / HCR	k_8	[-]	2,8	3,3	3,4
Concrete edge failure						
Effective length of fastener in shear loading		l_f	[mm]	h_{ef}		
Outside diameter of fastener		d_{nom}	[mm]	10	12	16

[1)] In absence of other national regulations

Table C5: Characteristic values for **seismic loading,** performance category **C1**

Anchor size				**M10**	**M12**	**M16**
Effective anchorage depth		$h_{ef} \geq$	[mm]	60	70	85
Tension load						
Installation factor		γ_{inst}	[-]		1,0	
Steel failure						
Characteristic resistance	vz	$N_{Rk,s,C1}$	[kN]	30,4	44,9	79,3
	A4 / HCR	$N_{Rk,s,C1}$	[kN]	30,4	44,9	74,6
Pull-out						
Characteristic resistance	vz	$N_{Rk,p,C1}$	[kN]	15,0	22,0	30,0
	A4 / HCR	$N_{Rk,p,C1}$	[kN]	17,0	22,0	35,0
Shear load						
Steel failure without lever arm						
Characteristic resistance	vz	$V_{Rk,s,C1}$	[kN]	24,4	33,8	52,3
	A4 / HCR	$V_{Rk,s,C1}$	[kN]	22,2	33,2	64,3
Factor for anchorages without annular gap		α_{gap}	[-]		1,0	

Table C6: Characteristic values for **seismic loading,** performance category **C2**

Anchor size				**M10**	**M12**	**M16**
Effective anchorage depth		$h_{ef} \geq$	[mm]	60	70	85
Tension load						
Installation factor		γ_{inst}	[-]		1,0	
Steel failure						
Characteristic resistance	vz	$N_{Rk,s,C2}$	[kN]	30,4	44,9	79,3
	A4 / HCR	$N_{Rk,s,C2}$	[kN]	30,4	44,9	74,6
Pull-out						
Characteristic resistance	vz	$N_{Rk,p,C2}$	[kN]	12,5	19,0	35,2
	A4 / HCR	$N_{Rk,p,C2}$	[kN]	7,7	13,8	29,4
Shear load						
Steel failure without lever arm						
Characteristic resistance	vz	$V_{Rk,s,C2}$	[kN]	19,0	28,0	43,3
	A4 / HCR	$V_{Rk,s,C2}$	[kN]	15,9	25,6	46,1
Factor for anchorages without annular gap		α_{gap}	[-]		1,0	

Table C7: Characteristic values **for tension and shear load** under **fire exposure, steel, zinc plated**

Anchor size				M10	M12	M16
Tension load						
Steel failure						
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	2,6	4,6	7,7
	R60			1,9	3,3	5,6
	R90			1,3	2,1	3,5
	R120			1,0	1,5	2,5
Shear load						
Steel failure without lever arm						
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	7,5	12,3	20,7
	R60			5,1	8,5	14,2
	R90			2,7	4,6	7,7
	R120			1,6	2,7	4,5
Steel failure with lever arm						
Characteristic resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	9,6	19,1	43,8
	R60			6,6	13,1	30,1
	R90			3,5	7,2	16,4
	R120			2,0	4,2	9,6

$N_{Rk,p,fi}$ and $N_{Rk,c,fi}$ according to EN 1992-4:2018

Table C8: Characteristic values **for tension and shear load** under **fire exposure, A4** and **HCR**

Anchor size				M10	M12	M16
Tension load						
Steel failure						
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	6,9	11,0	18,1
	R60			5,0	8,0	13,1
	R90			3,1	4,9	8,1
	R120			2,1	3,4	5,6
Shear load						
Steel failure <u>without</u> lever arm						
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	17,6	32,0	52,6
	R60			12,6	22,6	37,1
	R90			7,5	13,1	21,5
	R120			5,0	8,4	13,8
Steel failure <u>with</u> lever arm						
Characteristic resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	22,7	49,8	111,5
	R60			16,2	35,1	78,6
	R90			9,7	20,4	45,6
	R120			6,5	13,0	29,2

$N_{Rk,p,fi}$ and $N_{Rk,c,fi}$ according to EN 1992-4:2018

Table C9: Displacements under **tension load, steel, zinc plated**

Anchor size			M10	M12	M16
Displacements under static or quasi-static action $\delta_{N0} = \delta_{N0\text{-factor}} * N$ N: acting tension load $\delta_{N\infty} = \delta_{N\infty\text{-factor}} * N$					
Cracked concrete					
Factor for displacement	$\delta_{N0\text{-factor}}$	[mm/kN]	0,05	0,04	0,03
	$\delta_{N\infty\text{-factor}}$	[mm/kN]	0,20	0,15	0,11
Uncracked concrete					
Factor for displacement	$\delta_{N0\text{- factor}}$	[mm/kN]	0,01	0,004	0,005
	$\delta_{N\infty\text{- factor}}$	[mm/kN]	0,03	0,03	0,03
Displacement under seismic action C2					
Displacements for DLS	$\delta_{N,C2(DLS)}$	[mm]	4,7	4,2	4,5
Displacements for ULS	$\delta_{N,C2(ULS)}$	[mm]	16,1	12,9	12,8

Table C10: Displacements under **tension load, A4** and **HCR**

Anchor size			M10	M12	M16
Displacements under static or quasi-static action $\delta_{N0} = \delta_{N0\text{-factor}} * N$ N: acting tension load $\delta_{N\infty} = \delta_{N\infty\text{-factor}} * N$					
Cracked concrete					
Factor for displacement	$\delta_{N0\text{-factor}}$	[mm/kN]	0,06	0,05	0,02
	$\delta_{N\infty\text{-factor}}$	[mm/kN]	0,17	0,16	0,08
Uncracked concrete					
Factor for displacement	$\delta_{N0\text{- factor}}$	[mm/kN]	0,00	0,001	0,00
	$\delta_{N\infty\text{- factor}}$	[mm/kN]	0,05	0,05	0,05
Displacement under seismic action C2					
Displacements for DLS	$\delta_{N,C2(DLS)}$	[mm]	4,1	5,7	5,1
Displacements for ULS	$\delta_{N,C2(ULS)}$	[mm]	16,8	18,0	13,9

Table C11: Displacements under **shear load, steel, zinc plated**

Anchor size			**M10**	**M12**	**M16**
Displacements under static or quasi-static action $\delta_{V0} = \delta_{V0\text{-factor}} * V$ V: acting shear load $\delta_{V\infty} = \delta_{V\infty\text{-factor}} * V$					
Factor for displacement	$\delta_{V0\text{- factor}}$	[mm/kN]	0,09	0,09	0,07
	$\delta_{V\infty\text{- factor}}$	[mm/kN]	0,13	0,14	0,11
Displacement under seismic action C2					
Displacements for DLS	$\delta_{V,C2(DLS)}$	[mm]	3,1	3,7	3,8
Displacements for ULS	$\delta_{V,C2(ULS)}$	[mm]	5,5	9,9	9,6

Table C12: Displacements under **shear load, A4** and **HCR**

Anchor size			**M10**	**M12**	**M16**
Displacements under static or quasi-static action $\delta_{V0} = \delta_{V0\text{-factor}} * V$ V: acting shear load $\delta_{V\infty} = \delta_{V\infty\text{-factor}} * V$					
Factor for displacement	$\delta_{V0\text{- factor}}$	[mm/kN]	0,14	0,12	0,09
	$\delta_{V\infty\text{- factor}}$	[mm/kN]	0,20	0,17	0,14
Displacement under seismic action C2					
Displacements for DLS	$\delta_{V,C2(DLS)}$	[mm]	3,5	4,2	4,4
Displacements for ULS	$\delta_{V,C2(ULS)}$	[mm]	8,4	11,8	11,1