DECLARAȚIA DE PERFORMANȚĂ

DoP 0166

pentru fischer Zykon- Anchor FZA-Q (Ancore din metal pentru utilizare în beton) RO

1.	Cod unic de identificare al produsului-tip:	**DoP 0166**		
2.	Utilizare (utilizări) preconizată (preconizate):	**Prindere cu instalare ulterioară în beton fisurat sau nefisurat.** **Consultați suplimentul, în special anexele B1- B4**		
3.	Fabricant:	**fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Germany**		
4.	Reprezentant autorizat:	**–**		
5.	Sistemul (sistemele) de evaluare și de verificare a constanței performanței:	**1**		
6.	Documentul de evaluare european:	**EAD 330232-01-0601, (Edition 12/ 2019)**		
	Evaluarea tehnică europeană:	**ETA-16/0338; 2020-03-30**		
	Organismul de evaluare tehnică:	**DIBt- Deutsches Institut für Bautechnik**		
	Organism (organisme) notificat(e):	**1343 MPA Darmstadt / 2873 TU Darmstadt**		
7.	Performanța (performanțe) declarată (declarate):			
	Rezistență mecanică și stabilitate (BWR 1)			
	Rezistența caracteristică la întindere (pentru încărcări statice și cvasistatice):	Rezistența la cedarea oțelului:	Anexele C1	E_S= 210 000 MPa
		Rezistența la smulgere:	Anexele C1	
		Rezistența la cedarea conului de beton:	Anexele C1	
		Robustețe:	Anexele C1	
		Distanța minimă față de margine și între ancore:	Anexele C2	
		Distanța față de margine pentru a preveni fisuri sub încărcare:	Anexele C1	
	Rezistența caracteristică la forfecare (pentru încărcări statice și cvasistatice), Method A:	Rezistența la cedarea oțelului (rezistența la forfecare	Anexele C1	
		Rezistența la cedarea cu braț de levier:	Anexele C1	
	Rezistență caracteristică și Deplasări pentru performanță seismică de categoriile C1 și C2:	Rezistența la întindere, deplasări, categoria C1:	Anexele C4	
		Rezistența la întindere, deplasări, categoria C2:	Anexele C4, C5	
		Rezistența la forfecare, deplasări, categoria C1:	Anexele C4	
		Rezistența la forfecare, deplasări, categoria C2:	Anexele C3, C5	
		Factor gol circular:	Anexele C4	
	Rezistență caracteristică pentru un design simplificat:	Metoda B:	NPD	
		Metoda C:	NPD	
	Deplasări și durabilitate:	Deplasări sub încărcari statice și cvasistatice:	Anexele C5	
		Durabilitate:	Anexele A2, B1	
	Siguranța în caz de incendiu (BWR 2)			
	Reacție la foc:	Clasa (A1)		
	Rezistența la incendiu:	Rezistența la foc în ipoteza cedării oțelului	Anexele C3	
		Rezistența la foc în ipoteza cedării prin smulgere	Anexele C3	
		Rezistența la foc în ipoteza cedării oțelului	Anexele C3	

8. Documentatie tehnică adecvată și/sau documentatie tehnică specifică: –

Performanța produsului identificat mai sus este în conformitate cu setul de performanțe declarate. Această declarație de performanță este eliberată în conformitate cu Regulamentul (UE) nr. 305/2011, pe răspunderea exclusivă a fabricantului identificat mai sus.

Semnată pentru și în numele fabricantului de către:

Thilo Pregartner, Dr.-Ing.

Peter Schillinger, Dipl.-Ing.

Tumlingen, 2020-04-20

Această declarație de performanță a fost întocmită în mai multe limbi. În cazul unei divergențe de interpretare, versiunea în limba engleză prevalează întotdeauna.

Suplimentul include informații voluntare și complementare în limba engleză, în afara cerințelor legale (specificate neutru din punct de vedere al limbii).

Specific Part

1 Technical description of the product

The fischer Zykon Anchor FZA-Q is an anchor made of hot-dipped galvanized steel which is placed into a drilled hole and anchored by torque controlled expansion and mechanical interlock.

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 anchor 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 anchor 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 and C 2
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C 1
Displacements (static and quasi-static loading)	See Annex C 5
Durability	See Annex B 1
Characteristic resistance and displacements for seismic performance category C1 and C2	See Annex C 4 and C 5

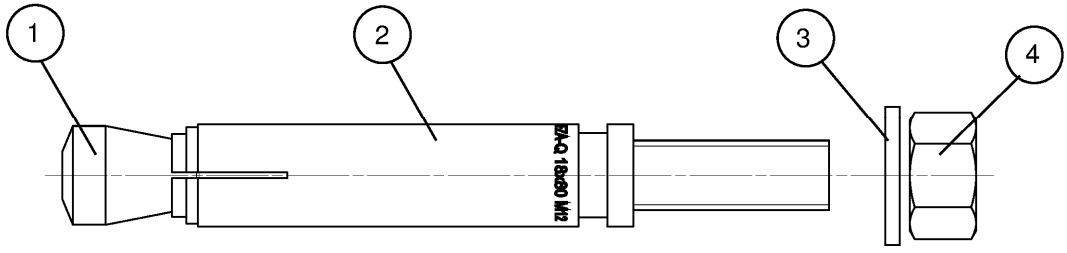
3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C 3

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

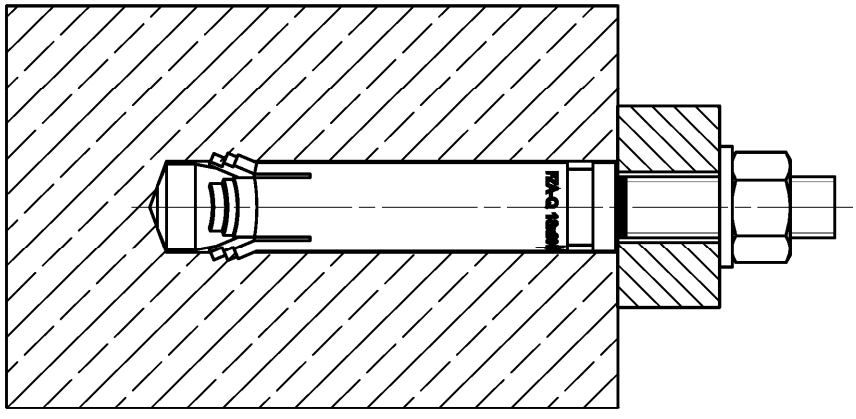
In accordance with the European Assessment Document EAD 330232-01-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1



① Cone bolt
② Expansion sleeve
③ Washer
④ Hexagon nut

Installed condition



(Fig. not to scale)

fischer Zykon Anchor FZA-Q

Product description
Installed condition

Annex A 1

Product marking and dimensions

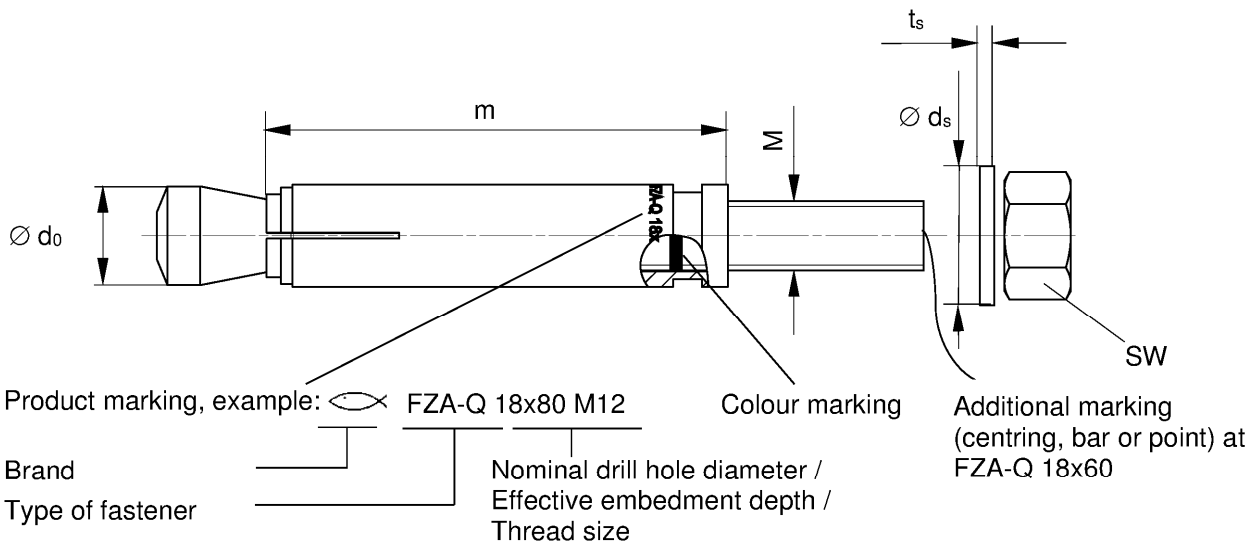


Table A2.1: Dimensions [mm]

Size		FZA-Q		
		14 x 50 M10	18 x 60 M12	18 x 80 M12
M = d	=	10	12	
∅ d_0	=	13,5	17	
m	=	50	60	80
SW	=	17	19	
t_S	≥	1,8	2,3	
∅ d_s	≥	19	23	

Table A2.2: Materials (hot-dip galvanised ≥ 50µm, EN ISO 10684:2011[1)])

Part	Designation	Material
1	Cone bolt[2)]	Cold form steel or free cutting steel class 8.8 acc. to EN ISO 898-1:2013 Nominal steel tensile strength f_{uk} ≤ 1000 N/mm²
2	Expansion sleeve[2)]	Steel
3	Washer	Cold strip, EN 10139:2016
4	Hexagon nut	Steel, property class min. 8, EN ISO 898-2:2012

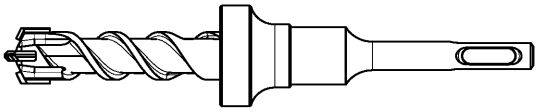
[1)] Alternative method: sherardised ≥ 50 µm, EN 13811:2003

[2)] Optional: clear paint

(Fig. not to scale)

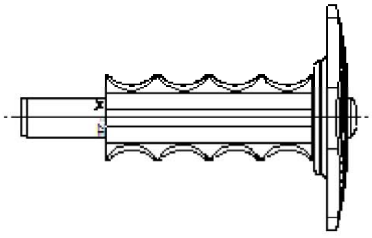
Tools

Drill bit FZBB

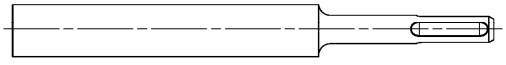


Standard drill bit

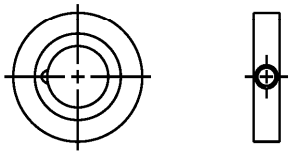
Setting tool FZE



Machine setting tool FZA-Q



Optional fischer filling disc FFD for e.g. seismic applications



Specifications of intended use

Size	FZA-Q		
	14 x 50 M10	18 x 60 M12	18 x 80 M12
Hot-dip galvanised	✓		
Static and quasi-static loads			
Cracked and uncracked concrete			
Seismic action for performance category C1			
Seismic action for performance category C2			
Fire exposure			

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibers (cracked and uncracked) of strength classes C20/25 to C50/60 according to EN 206:2013+A1:2016

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions

Design:

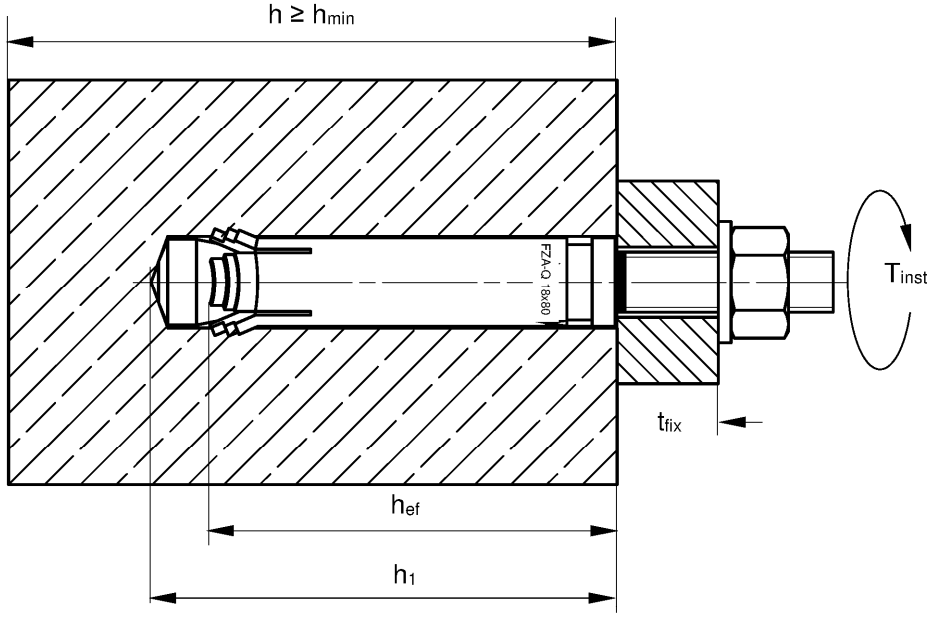
- Fastenings are designed under the responsibility of an engineer experienced in fastenings and concrete work
- Verifiable calculation notes and drawings are to be prepared taking account of the loads to be anchored. The position of the fastener is indicated on the design drawings (e.g. position of the fastener relative to reinforcement or to supports, etc.)
- Design of fastenings according to EN 1992-4:2018

Installation parameters

Table B2.1: Installation parameters

Size				FZA-Q		
				14 x 50 M10	18 x 60 M12	18 x 80 M12
Nominal drill hole diameter	d_0	=	[mm]	14	18	
Depth of drill hole in concrete	h_1	=	[mm]	58	74	94
Cutting diameter of drill bit	d_{cut}	=	[mm]	14,50	18,50	
Diameter of clearance hole in the fixture	d_f	≤	[mm]	12	14	
Maximum installation torque[1)]	T_{inst}	=	[Nm]	20	45	

[1)] Minimum installation torque = hand - tightening

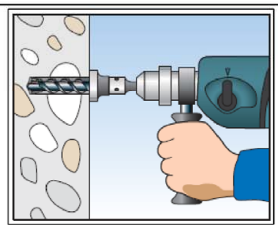


h_{ef} = Effective embedment depth
t_{fix} = Thickness of the fixture
h_1 = Depth of drill hole to deepest point
h = Thickness of the concrete member
h_{min} = Minimum thickness of concrete member
T_{inst} ≤ Maximum installation torque

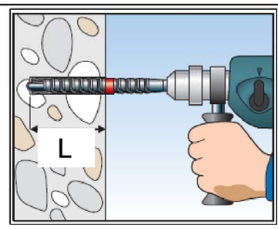
Installation instructions

- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Use of the fastener only as supplied by the manufacturer without exchanging the components of the fastener
- Checking before placing the fastener to ensure that the strength class of the concrete in which the fastener is to be placed is in the range given and is not lower than that of the concrete to which the characteristic loads apply
- Check of concrete being well compacted, e.g. without significant voids
- Drill hole created perpendicular +/- 5° to concrete surface, positioning without damaging the reinforcement
- In case of aborted hole: new drilling at a minimum distance twice the depth of the aborted drill hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load is not in the direction of load application

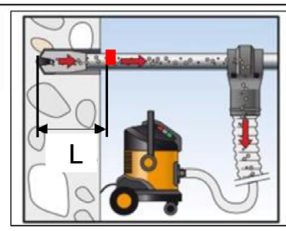
Drill and clean



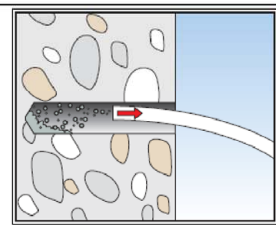
1a
Stop drill FZBB



1b
Hammer drill

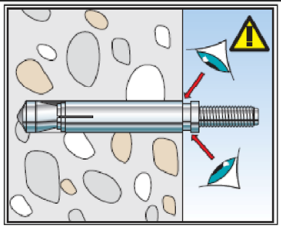


1c (next step: 3)
Drill the hole with hollow driller

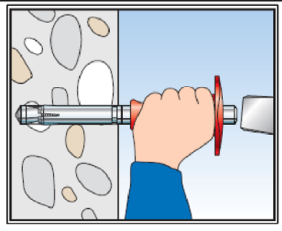


2
Clean drill hole

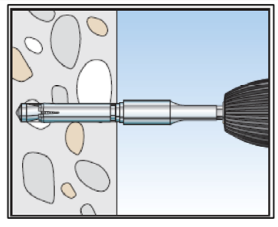
Set fastener



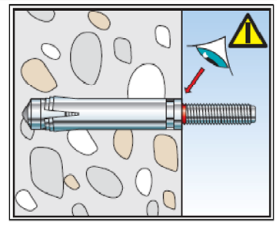
3
Check drill depth



4a
Hand-setting

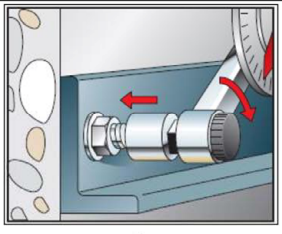


4b
Machine-setting



5
Check control colour

Installation torque / marking length

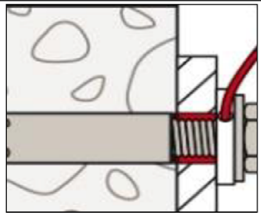


6
Apply T_{inst}

1b / 1c – marking length / stop length:

Size	L
FZA-Q 14x50 M10	58
FZA-Q 18x60 M12	74
FZA-Q 18x80 M12	94

Optional



7
Filling of the annular gap

The gap between bolt and fixture may be filled with mortar (compressive strength ≥ 50 N/mm² e.g. FIS SB) after step 6 (for eliminating the annular gap). The filling disc is additional to the standard washer. The thickness of the filling disc must be considered for definition of t_{fix}. Countersunk of the filling disc in direction to the anchor plate.

(Fig. not to scale)

fischer Zykon Anchor FZA-Q

Intended Use
Installation instructions

Annex B 4

Table C1.1: Characteristic **tension resistance** under static and quasi-static action

Size				FZA-Q		
				14 x 50 M10	18 x 60 M12	18 x 80 M12
Steel failure						
Characteristic resistance		$N_{Rk,s}$	[kN]	40,7	60,1	
Partial factor for steel failure		γ_{Ms}	[-]	1,5		
Modulus of elasticity		E_s	[N/mm²]	210.000		
Pullout failure						
Characteristic resistance in C20/25	cracked concrete	$N_{Rk,p}$	[kN]	10,0	16,0	22,2
	uncracked concrete			17,4	22,9	35,2
Increasing factor for $N_{Rk,p}$		ψ_c	[-]	$(f_{ck} / 20)^{0,5}$		
Installation safety factor		γ_{inst}	[-]	1,0		
Concrete cone and splitting failure						
Effective embedment depth		h_{ef}	[mm]	50	60	80
Factor for cracked concrete		$k_{cr,N}$	[-]	7,7		
Factor for uncracked concrete		$k_{ucr,N}$		11,0		
Characteristic spacing		$s_{cr,N}$	[mm]	3 h_{ef}		
Characteristic edge distance		$c_{cr,N}$		1,5 h_{ef}		
Characteristic spacing		$s_{cr,sp}$		3,5 h_{ef}		
Characteristic edge distance		$c_{cr,sp}$		1,75 h_{ef}		
Characteristic resistance to splitting		$N^0_{Rk,sp}$	[kN]	min $\{N^0_{Rk,c}; N_{Rk,p}\}$ [1)]		

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

Table C1.2: Characteristic **shear resistance** under static and quasi-static action

Size				FZA-Q		
				14 x 50 M10	**18 x 60 M12**	**18 x 80 M12**
Steel failure without lever arm						
Characteristic resistance		$V^0_{Rk,s}$	[kN]	20,4	33,7	
Partial factor for steel failure		γ_{Ms}	[-]	1,25		
Factor for ductility		k_7		1,0		
Steel failure with lever arm and concrete pryout failure						
Characteristic bending resistance		$M^0_{Rk,s}$	[Nm]	60,0	105,0	
Partial factor for steel failure		γ_{Ms}	[-]	1,25		
Factor for ductility		k_7		1,0		
Factor for pryout failure		k_8		1,0	2,0	
Concrete edge failure						
Effective length in concrete		l_f	[mm]	50	60	80
Effective diameter of fastener		d_{nom}		14	18	

fischer Zykon Anchor FZA-Q

Performances
Characteristic tension resistance under static and quasi-static action
Characteristic shear resistance under static and quasi-static action

Annex C 1

Table C2.1: Minimum thickness of concrete members, minimum spacings and edge distances

Size				FZA-Q		
				14 x 50 M10	**14 x 50 M10 18 x 60 M12**	**14 x 50 M10 18 x 60 M12 18 x 80 M12**
Minimum thickness of concrete member		h_{min}	[mm]	**100**	**120**	**160**
Cracked concrete						
Minimum	spacing	s_{min}	[mm]	120	120	75
	edge distance	c_{min}		100	100	75
Uncracked concrete						
Minimum spacing		s_{min}	[mm]	120	100	75
		for $c \geq$		120	120	90
Minimum edge distance		c_{min}	[mm]	100	100	90
		for $s \geq$		180	160	75

Intermediate values for s_{min} and c_{min} by linear interpolation

Table C3.1: Characteristic **tension resistance** under **fire exposure**

FZA-Q		R30			R60		
		$N_{Rk,s,fi}$	$N_{Rk,p,fi}$	$N_{Rk,c,fi}$	$N_{Rk,s,fi}$	$N_{Rk,p,fi}$	$N_{Rk,c,fi}$
14 x 50 M10	[kN]	2,6	2,7	3,0	1,4	2,7	3,0
18 x 60 M12		8,4	4,0	4,8	4,2	4,0	4,8
18 x 80 M12			5,5	9,9		5,5	9,9

FZA-Q		R90			R120		
		$N_{Rk,s,fi}$	$N_{Rk,p,fi}$	$N_{Rk,c,fi}$	$N_{Rk,s,fi}$	$N_{Rk,p,fi}$	$N_{Rk,c,fi}$
14 x 50 M10	[kN]	1,0	2,7	3,0	0,8	2,1	2,4
18 x 60 M12		2,5	4,0	4,8	1,7	3,2	3,8
18 x 80 M12			5,5	9,9		4,4	7,9

Table C3.2: Characteristic **shear resistance** under **fire exposure**

FZA-Q	R30		R60	
	$V_{Rk,s,fi}$ [kN]	$M^0_{Rk,s,fi}$ [Nm]	$V_{Rk,s,fi}$ [kN]	$M^0_{Rk,s,fi}$ [Nm]
14 x 50 M10	2,6	3,4	1,4	1,8
18 x 60 M12	8,4	13,1	4,2	6,5
18 x 80 M12				

FZA-Q	R90		R120	
	$V_{Rk,s,fi}$ [kN]	$M^0_{Rk,s,fi}$ [Nm]	$V_{Rk,s,fi}$ [kN]	$M^0_{Rk,s,fi}$ [Nm]
14 x 50 M10	1,0	1,3	0,8	1,0
18 x 60 M12	2,5	3,9	1,7	2,6
18 x 80 M12				

Table C3.3: **Minimum spacings** and **minimum edge distances** under **fire exposure** for **tension** and **shear** load

Size			FZA-Q		
			14 x 50 M10	**18 x 60 M12**	**18 x 80 M12**
Spacing	$s_{min,fi}$	[mm]	$4 \cdot h_{ef}$		
Edge distance	$c_{min,fi}$		$c_{min,fi} = 2 \cdot h_{ef}$, for fire exposure from more than one side $c_{min,fi} \geq 300$ mm		

Table C4.1: Characteristic values of **tension** and **shear resistance** under **seismic performance category C1**

Size			FZA-Q 14 x 50 M10	FZA-Q 18 x 60 M12	FZA-Q 18 x 80 M12
Steel failure					
Characteristic resistance tension load C1	$N_{Rk,s,C1}$	[kN]	40,7	60,1	
Partial factor for steel failure	$\gamma_{Ms,C1}$	[-]	1,5		
Pullout failure					
Characteristic resistance tension load in cracked concrete C1	$N_{Rk,p,C1}$	[kN]	10,0	16,0	22,0
Installation sensitivity factor	$\gamma_{2,C1}$	[-]	1,0		
Steel failure without lever arm					
Characteristic resistance shear load C1	$V_{Rk,s,C1}$	[kN]	15,9	30,3	
Partial factor for steel failure	$\gamma_{Ms,C1}$	[-]	1,25		

Table C4.2: Characteristic values of **tension** and **shear resistance** under **seismic performance category C2**

Size			**FZA-Q 14 x 50 M10**	**FZA-Q 18 x 60 M12**	**FZA-Q 18 x 80 M12**
Steel failure					
Characteristic resistance tension load C2	$N_{Rk,s,C2}$	[kN]	40,7	60,1	
Partial factor for steel failure	$\gamma_{Ms,C2}$	[-]	1,5		
Pullout failure					
Characteristic resistance tension load in cracked concrete C2	$N_{Rk,p,C2}$	[kN]	4,0	4,7	6,5
Installation safety factor	$\gamma_{2,C2}$	[-]	1,0		
Steel failure without lever arm					
Characteristic resistance shear load C2	$V_{Rk,s,C2}$	[kN]	11,8	23,3	
Partial factor for steel failure	$\gamma_{Ms,C2}$	[-]	1,25		

Table C4.3: Annular gap for **seismic performance categories C1 and C2**

Δ_{gap}								
$\Delta_{gap} = d_f - d$	[mm]	0,00[1)]	0,25	0,50	0,75	1,00	1,25	≥ 1,50
α_{gap}		1,00	0,86	0,75	0,66	0,60	0,54	0,50

[1)] Filling of the Δ_{gap} according Annex B4

Table C5.1: Displacements under static and quasi-static **tension** loads

Size				FZA-Q		
				14 x 50 M10	**18 x 60 M12**	**18 x 80 M12**
Tension load in cracked concrete C20/25	N		[kN]	5,1	10,5	
Displacements	δ_{N0}		[mm]	0,4	0,8	
	$\delta_{N\infty}$			0,9	1,7	
Tension load in uncracked concrete C20/25	N		[kN]	12,2	16,2	
Displacements	δ_{N0}		[mm]	0,9	1,0	
	$\delta_{N\infty}$			1,5	1,7	

Table C5.2: Displacements under static and quasi-static **shear** loads

Size				FZA-Q		
				14 x 50 M10	**18 x 60 M12**	**18 x 80 M12**
Shear load in cracked and uncracked concrete C20/25	V		[kN]	9,5	19,3	
Displacements	δ_{V0}		[mm]	0,9	2,1	
	$\delta_{V\infty}$			1,6	3,1	

Table C5.3: Displacements under **tension** loads for **seismic performance category C2**

Size				FZA-Q		
				14 x 50 M10	**18 x 60 M12**	**18 x 80 M12**
Displacement	DLS	$\delta_{N,C2}$	[mm]	3,2	4,0	
	ULS	$\delta_{N,C2}$		13,3	12,9	

Table C5.4: Displacements under **shear** loads for **seismic performance category C2**

Size				FZA-Q		
				14 x 50 M10	**18 x 60 M12**	**18 x 80 M12**
Displacement	DLS	$\delta_{V,C2}$	[mm]	3,6	4,6	4,6
	ULS	$\delta_{V,C2}$		6,8	6,8	6,6