Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-04/0003 of 12 June 2018

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	fischer Heavy-duty anchor TA M , TA M S , TA M T
Product family to which the construction product belongs	Mechanical fasteners for use in concrete
Manufacturer	fischerwerke GmbH & Co. KG Klaus-Fischer-Straße 1 72178 Waldachtal DEUTSCHLAND
Manufacturing plant	fischerwerke
This European Technical Assessment contains	13 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 330232-00-0601

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Specific Part

1 Technical description of the product

The fischer Heavy-duty anchor TA M, TA M S and TA M T in the range of M6, M8, M10 and M12 is an anchor made of galvanised steel which is placed into a drilled hole and anchored by torque-controlled expansion with the hexagon head bolt.

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 concrete screw 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 the assumption of working life of the concrete screw 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
Displacements (static and quasi-static loading)	see Annex C 2
Characteristic resistance and displacements for seismic performance categories C1 and C2	No performance assessed

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	No performance assessed

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

In accordance with European Assessment Documents EAD No. 330232-00-0601 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 at Deutsches Institut für Bautechnik.

Issued in Berlin on 12 June 2018 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

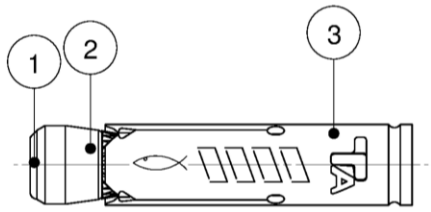
beglaubigt:
Baderschneider

Deutsches Institut für Bautechnik

Pre-positioned installation:

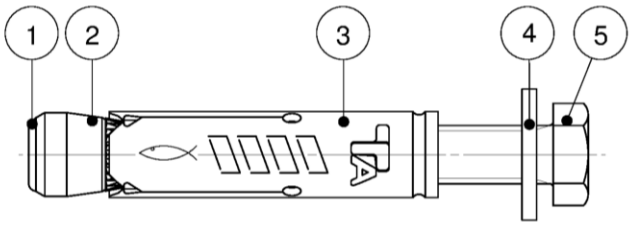
TA M

The hexagon head screw and the washer according to table A4.1 and A4.2 must be provided by the user



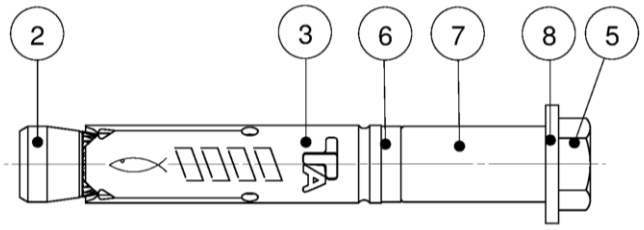
TA M S

The hexagon head screw is provided by the manufacturer (fischer) together with the anchor



In-place installation:

TA M T



1	Plastic cap (optional)	5	Hexagon head screw
2	Cone-nut	6	Distance ring
3	Expansion sleeve	7	Spacing sleeve
4	Washer (TA M / TA M S)	8	Washer (TA M T)

(Fig. not to scale)

fischer Heavy-duty anchor TA M, TA M S, TA M T	**Annex A 1**
Product description Anchor types	

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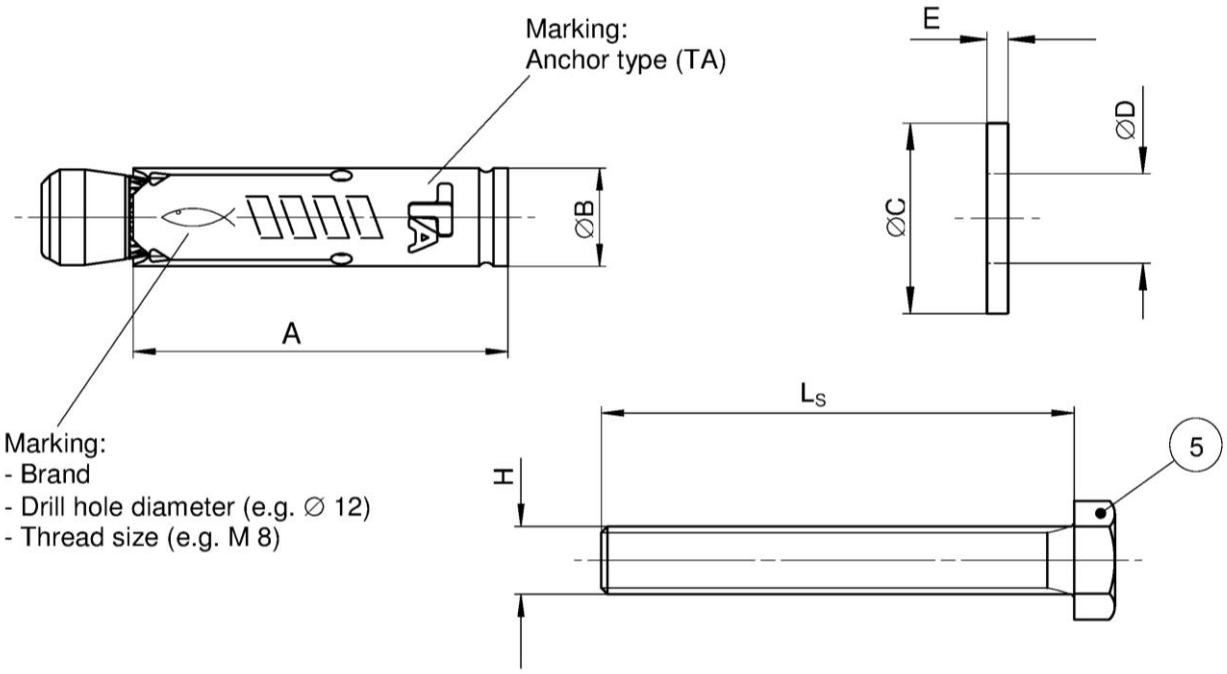
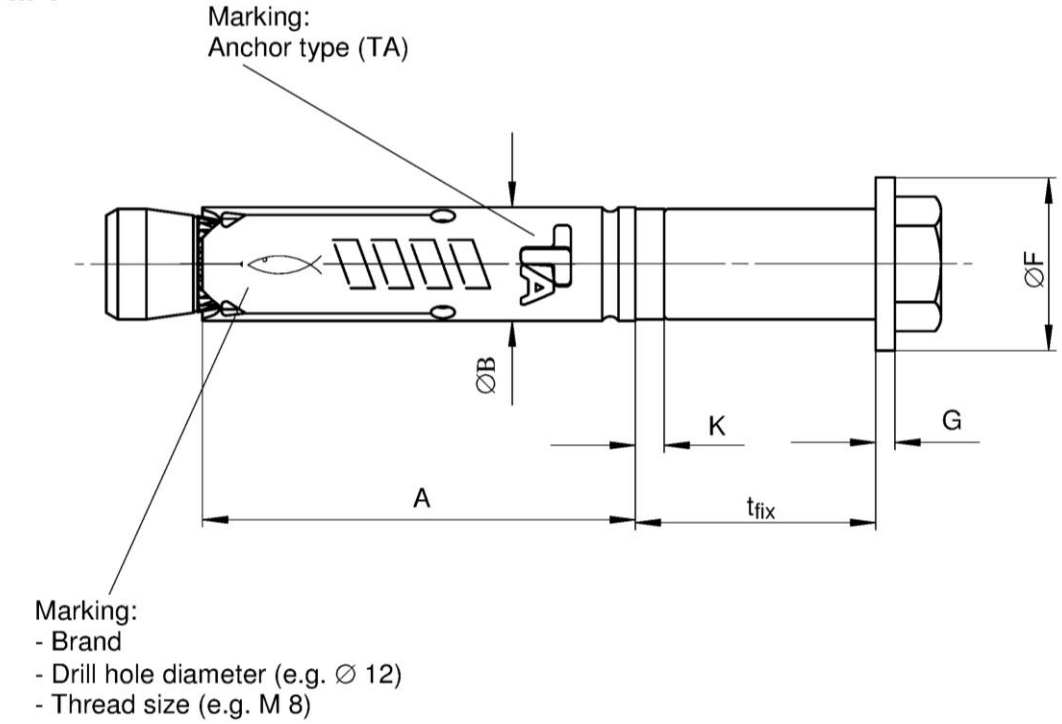
TA M / TA M S



TA M T



(Fig. not to scale)

fischer Heavy-duty anchor TA M, TA M S, TA M T

Product description
Anchor components

Annex A 2

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Table A3.1: Anchor dimensions [mm]

Part	Designation	Type of anchor			M6	M8	M10	M12
3	Expansion sleeve	TA M / TA M S / TA M T	A		40,0	45,0	55,0	70,0
			∅ B		9,6	11,8	14,5	17,5
4	Washer [1]	TA M S	∅ C	≥	11,0	15,0	19,0	23,0
			E	≥	1,4	1,4	1,8	2,3
8	Washer	TA M T	∅ F	≥	17,0	21,0	25,0	30,0
			G	≥	1,4	1,8	2,3	2,7
5	Hexagon head screw [2]	TA M S / TA M T	L_s	≥	t_{fix} + 50	t_{fix} + 55	t_{fix} + 70	t_{fix} + 85
			H		M6	M8	M10	M12
6	Distance ring	TA M T	K	=	3,0	3,0	3,0	3,0

[1] For specification - summary of washer for TA M see table A4.2
[2] For specification - summary of hexagon head screw for TA M see table A4.1

Table A3.2: Materials

Part	Designation	Type of anchor	Materials	Treatment
1	Plastic cap [1]	TA M / TA M S	Polyamide	-
2	Cone-nut	TA M / TA M S / TA M T	Steel, EN 10277:2008	Zinc plated according to EN ISO 4042:2017, min 5 µm, additional functional coating
3	Expansion sleeve	TA M / TA M S / TA M T	Cold-rolled steel EN 10139:2016	Zinc plated according to EN ISO 4042:2017, min 5 µm
4	Washer [2]	TA M S	Steel, min 140 HV	
8	Washer	TA M T		
5	Hexagon head screw [3]	TA M S / TA M T	Steel, property class 8.8	
6	Distance ring	TA M T	Polyethylen	-
7	Distance sleeve	TA M T	Cold-rolled steel EN 10139:2016/ Steel EN 10 277:2008	Zinc plated according to EN ISO 4042:2017, min 5 µm

[1] Optional
[2] For specification - summary of washer for TA M see table A4.2
[3] For specification - summary of hexagon head screw for TA M see table A4.1

fischer Heavy-duty anchor TA M, TA M S, TA M T

Product description
Anchor dimensions
Materials

Annex A 3

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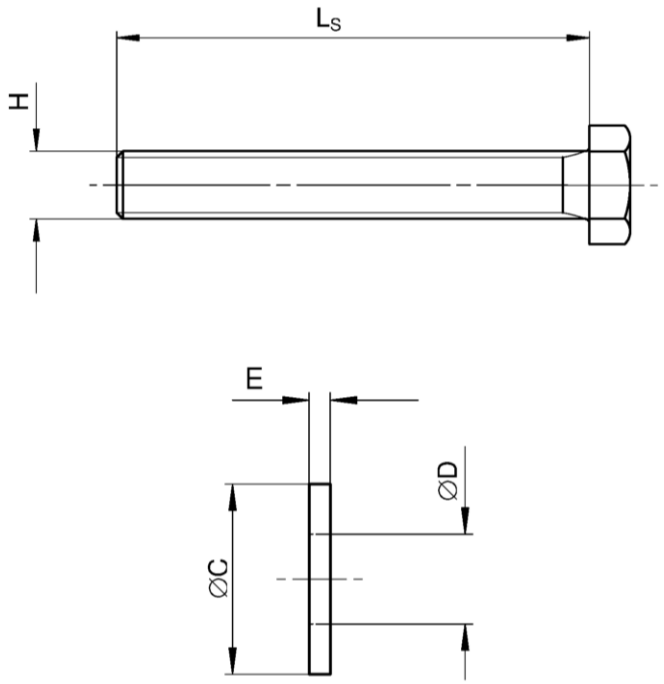
Table A4.1: Selection criteria for the hexagon head screw (TA M)

Description			TA M6	TA M8	TA M10	TA M12
Length of hexagon head screw	L_S	[mm]	$\geq t_{fix} + 50$	$\geq t_{fix} + 55$	$\geq t_{fix} + 70$	$\geq t_{fix} + 85$
Thread size	H	[-]	M6	M8	M10	M12
Standardisation			ISO 4014:2017 / ISO 4017:2014 or DIN 931:1987 / DIN 933:1987			
Material			Steel, property class 8.8			
Treatment			Zinc plated according to EN ISO 4042:2017, min 5 µm			

Table A4.2: Selection criteria for the washer (TA M)

Description				TA M6	TA M8	TA M10	TA M12
Hole diameter	D	min	[mm]	6,0	8,0	10,0	12,0
		max		6,6	8,6	10,8	13,3
External diameter	C			≥ 11,0	≥ 15,0	≥ 19,0	≥ 23,0
Thickness	E	min		1,4	1,4	1,8	2,3
		max		3,0	3,0	4,0	5,0
Material				Steel, hardness class min 140 HV			
Treatment				Zinc plated according to EN ISO 4042:2017, min 5 µm			



(Fig. not to scale)

fischer Heavy-duty anchor TA M, TA M S, TA M T

Product description
Dimensions
Materials

Annex A 4

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Specifications of intended use

fischer Heavy-duty anchor	TA M6	TA M8	TA M10	TA M12
Steel, zinc plated			✓	
Static and quasi-static loads			✓	
Uncracked concrete			✓	

Base materials:
- Normal weight concrete according to EN 206-1:2000
- Strength classes C20/25 to C50/60 according to EN 206-1:2000

Use conditions (Environmental conditions):
- Structures subject to dry internal conditions

Design:
- Anchorages have to be designed under the responsibility of an engineer experienced in anchorages and concrete work
- Verifiable calculation notes and drawings have to be 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 of fastenings according to FprEN 1992-4: 2016 and EOTA Technical Report 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
- Hammer or hollow drilling according to Annex B3
- 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 it is not in the direction of load application

fischer Heavy-duty anchor TA M, TA M S, TA M T	**Annex B 1**
Intended use Specifications	

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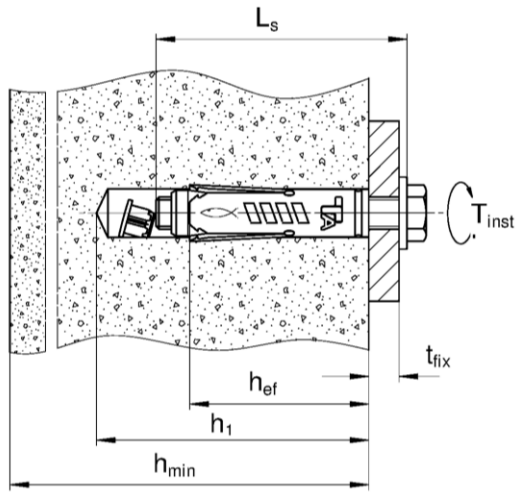
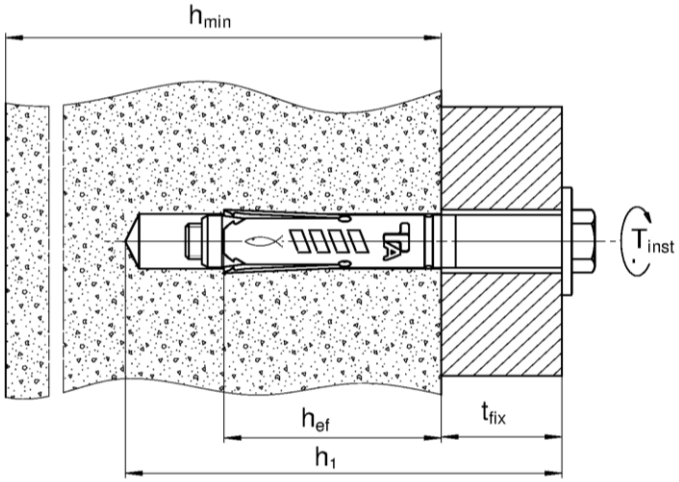
Table B2.1: Installation parameters for TA M / TA M S / TA M T

Anchor size				TA M6	TA M8	TA M10	TA M12
Nominal drill hole diameter	d_0			10	12	15	18
Maximum drill bit diameter	d_{cut}	≤		10,45	12,50	15,50	18,50
Length of hexagon head screw	L_S	≥		t_{fix} + 50	t_{fix} + 55	t_{fix} + 70	t_{fix} + 85
Depth of drill hole (TA M / TA M S)	h_1	≥	[mm]	L_s - t_{fix} + 15		L_s - t_{fix} + 20	
Depth of drill hole (TA M T)	h_1			L_s + 10			
Diameter of clearance hole in the fixture (TA M / TA M S)	d_f	≤		7	9	12	14
Diameter of clearance hole in the fixture (TA M T)	d_f			12	14	18	20
Thickness of fixture	$t_{fix,min}$			1			
	$t_{fix,max}$			150	200	250	300
Required torque moment	T_{inst}		[Nm]	10	20	40	75

TA M / TA M S:



TA M T:



L_s = Length of hexagon head screw
h_{ef} = Effective embedment depth
t_{fix} = Thickness of the fixture
h_{min} = Minimum thickness of concrete member
h_1 = Depth of drill hole to deepest point
T_{inst} = Required setting torque

Table B2.2: Minimum thickness of concrete member, minimum spacing and minimum edge distances

Anchor size			TA M6	TA M8	TA M10	TA M12
Minimum thickness of concrete member	h_{min}	[mm]	100	100	110	140
Minimum spacing	s_{min}		80	90	110	160
Minimum edge distance	c_{min}		50	60	70	120

(Fig. not to scale)

fischer Heavy-duty anchor TA M, TA M S, TA M T

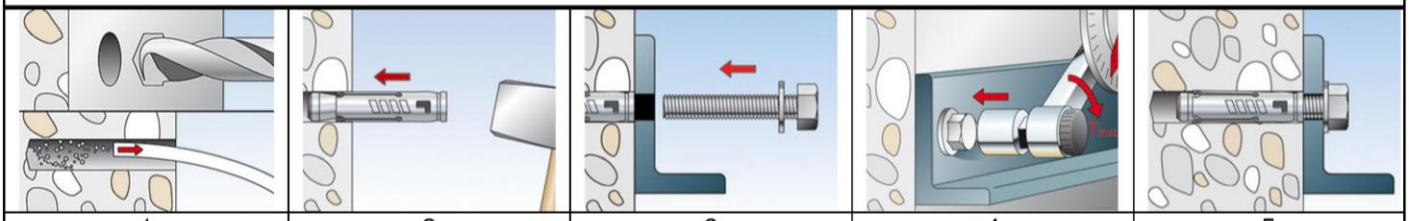
Annex B 2

Intended Use
Installation instructions
Minimum thickness of concrete member, minimum spacing and minimum edge distance

Deutsches Institut für Bautechnik DIBt

Installation instruction

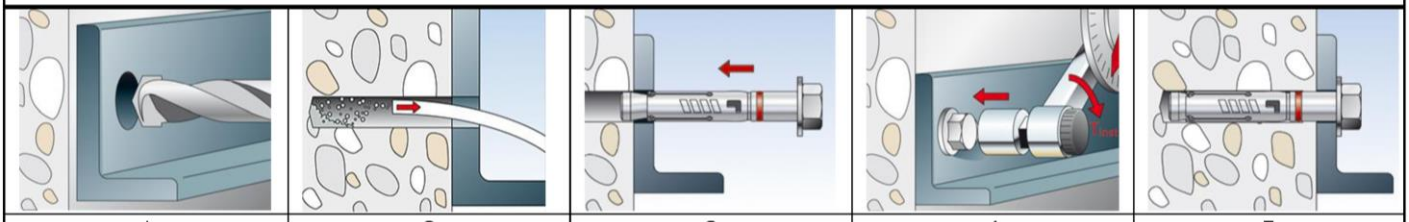
Pre-positioned installation TA M / TA M S



1	2	3	4	5

No.	Description	
1	Create drill hole with hammer drill, clean bore hole	Create drill hole with hollow drill and vacuum cleaner
2	Set the fastener	
3	Attach the fixture and turn the screw in	
4	Apply required torque moment T_{inst}	
5	Installed fastener	

Push-through installation TA M T



1	2	3	4	5

No.	Description	
1	Create drill hole with hammer drill	Create drill hole with hollow drill and vacuum cleaner
2	Clean bore hole	-
3	Set the fastener	
4	Apply required torque moment T_{inst}	
5	Installed fastener	

Types of drills

Hammer drill

Hollow drill 

fischer Heavy-duty anchor TA M, TA M S, TA M T

Intended use
Installation instruction

Annex B 3

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Table C 1.1: Characteristic **tension** resistance under static and quasi-static loads

Anchor size				TA M6	TA M8	TA M10	TA M12
Steel failure							
Characteristic resistance property class 8.8	$N_{Rk,s}$		[kN]	16,1	29,3	46,4	67,4
Partial factor	γ_{Ms} [1]		[-]	1,5			
Pull-out failure							
Characteristic resistance in uncracked concrete	$N_{Rk,p}$	[kN]	C20/25	7,5	12	20	25
Increasing factors for $N_{Rk,p}$ for uncracked concrete	ψ_c		C25/30	1,12			
			C30/37	1,22			
			C35/45	1,32			
			C40/50	1,41			
			C45/55	1,50			
			C50/60	1,58			
Installation factor	γ_{inst}		[-]	1,0			
Concrete cone failure and splitting failure							
Effective embedment depth	h_{ef}		[mm]	40	45	55	70
Factor k_1	$k_{ucr,N}$		[-]	11,0 [2]			
Spacing (concrete cone failure)	$s_{cr,N}$		[mm]	120	135	220	210
Edge distance (concrete cone failure)	$c_{cr,N}$			60	68	110	105
Spacing (splitting)	$s_{cr,sp}$			120	180	330	420
Edge distance (splitting)	$c_{cr,sp}$			60	90	165	210

[1] In absence of other national regulations
[2] Based on concrete strength as cylinder strength

fischer Heavy-duty anchor TA M, TA M S, TA M T

Performances
Characteristic **tension** resistance under static and quasi-static loads

Annex C 1

Deutsches Institut für Bautechnik DIBt

Table C2.1: Characteristic values of **shear** resistance under static and quasi-static loads

Anchor size			TA M6	TA M8	TA M10	TA M12
Shear load without lever arm						
Characteristic resistance property class 8.8	$V^0_{Rk,s}$	[kN]	5,8	11,7	19,2	29,8
Partial factor	γ_{Ms} [1)]	[-]	1,25			
Ductility factor	k_7		1,0			
Shear load with lever arm						
Characteristic bending moment property class 8.8	$M^0_{Rk,s}$	[Nm]	12	30	60	105
Partial factor	γ_{Ms} [1)]	[-]	1,25			
Concrete pryout failure						
Ductility factor	k_7	[-]	1,0			
Factor	k_8		1,1	1,8	1,8	2,0
Concrete edge failure						
Effective length of the fastener	l_f	[mm]	40	45	55	70
Outside diameter of fastener	d_{nom}		10	12	15	18

[1)] In absence of other national regulations

Table C2.2: Displacements under static and quasi static **tension** loads

Anchor size			TA M6	TA M8	TA M10	TA M12
Tension load in uncracked concrete		[kN]	3,0	4,8	7,9	9,9
Displacements	δ_{N0}	[mm]	0,7	0,7	1,2	1,2
	$\delta_{N\infty}$		1,0	1,0	1,8	1,8

Table C2.3: Displacements under static and quasi static **shear** loads

Anchor size			TA M6	TA M8	TA M10	TA M12
Shear load in uncracked concrete		[kN]	3,3	6,7	11,0	17,0
Displacements	δ_{V0}	[mm]	2,1	1,9	3,1	3,3
	$\delta_{V\infty}$		3,1	2,8	4,6	4,9

fischer Heavy-duty anchor TA M, TA M S, TA M T

Performances
Characteristic **shear** resistance under static and quasi-static loads
Displacements under tension and shear loads

Annex C 2